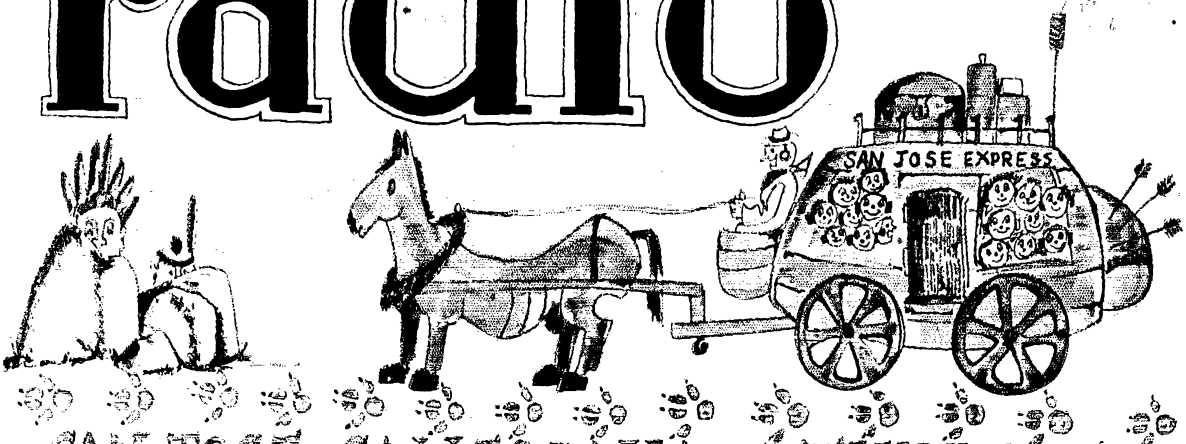
QST

July 1965
60 Cents

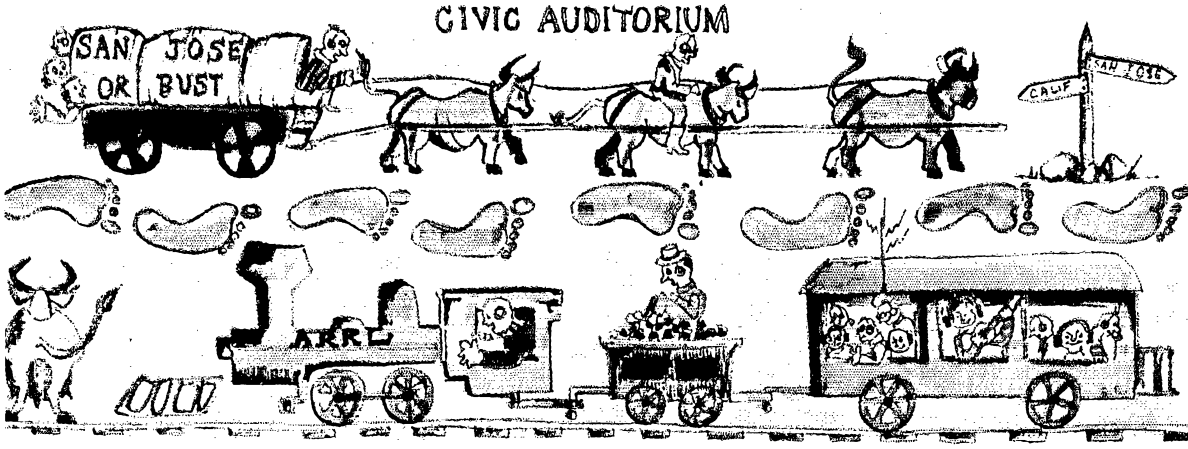
devoted entirely to

amateur radio



SAN JOSE, CALIFORNIA — JULY 2-5

1965 NATIONAL CONVENTION
CIVIC AUDITORIUM



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

hallicrafters has harnessed 500 watts of brute power for only $395.

NEW SR-500 Jornado

tri-band transceiver!

Own your own private tornado—*500 watts worth of sheer power* for the big, effortless signal you've always wanted in a transceiver. And that's just the beginning! You get:

Exclusive Hallicrafters AALC (Amplified Automatic Level Control) providing up to 12 db. of effective compression • RIT (Receiver Incremental Tuning) with ± 3 kc. for superior net and CW operation • A superbly designed crystal lattice filter which makes the most of the desirable SSB transmission characteristics • A built-in changeover relay permits direct operation with the HT-45 or other linear amplifier • Sensitivity is less than 1 μv for 20 db. S+N/N ratio • Receiver employs a separate AVC amplifier providing a figure of merit of 100 db. • Price: $395.00 less power supplies and mobile mounting kit.

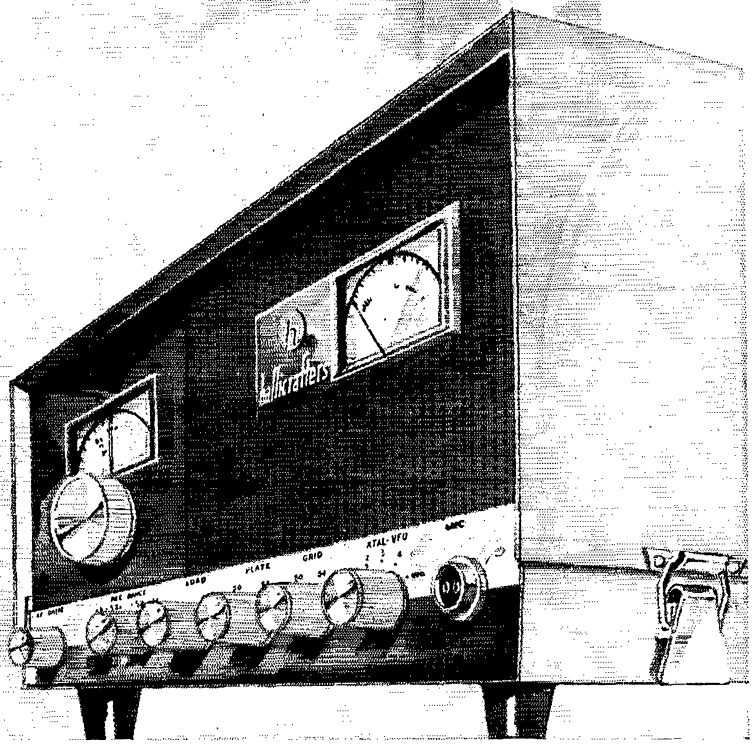
Get the full story from your distributor or write for complete specifications today.

"Quality through Craftsmanship"

hallicrafters

5th & Kostner Aves., Chicago, Ill. 60624
Export: International Div., Hallicrafters
Canada: Gould Sales Co., Montreal, P.Q.

Bye Bye Birdie



Efficient filters and selected injection frequencies make the NEW SR-46 and SR-42 VHF transceivers virtually immune to FM and TV interference.

Interference-free reception is only one of many advantages in the new SR-46. Complete six meter band coverage is another. Or full two meter coverage, if you prefer, in the companion SR-42 unit. Both give you double the usual bandspread, through use of dual tuning ranges. A neutralized nuvistor front end boosts sensitivity, and eleven tuned circuits increase selectivity while suppressing interference. Push to talk, of course.

Thorough field testing, before production, by hundreds of operators, assures you of years of trouble-free performance. It all adds up to your top VHF value. See the SR-46, or the SR-42, at your distributor today.

FEATURES

Frequency Coverage: 50 to 52 Mc and 52 to 54 Mc (144 to 146 Mc and 146 to 148 Mc in the SR-42). **Power Input:** 10-12 watts. **Power Supply:** 115 VAC and 12 VDC (vibrator and line cord optional extra). **Transmitter Crystals:** high frequency type; provision for four (one furnished), plus external VFO, switch-selected from front panel. **Tubes:** 10, plus zener diode oscillator control and four diodes (11 tubes, 2 zeners and four diodes in the SR-42). **"S" Meter** automatically switches to RFO. **Cabinet:** "snap-off" type for easy access. **Size:** 5½" high, 12⅛" wide, 8¼" deep. **Shipping Weight:** 17 lbs. **Amateur Net Price:** $189.95.

New SR-46

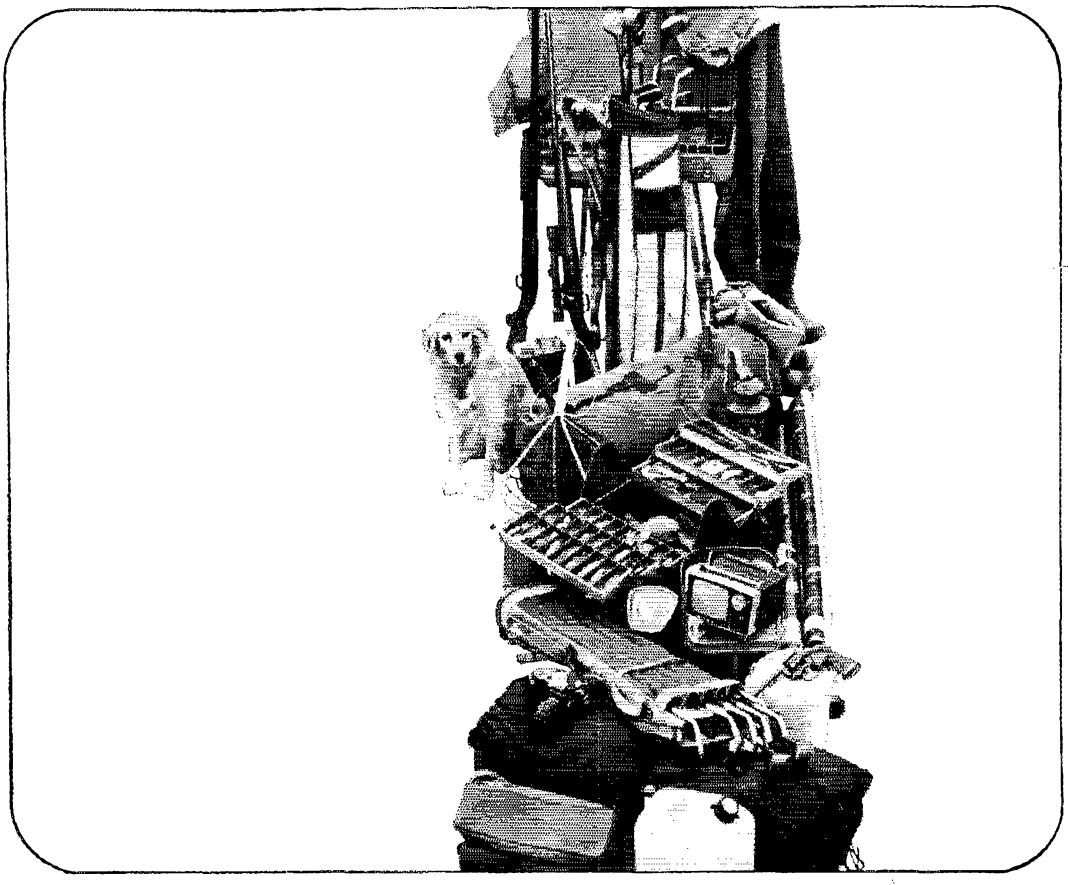
SIX METER VHF TRANSCEIVER and SR-42 for two meters

"Quality through Craftsmanship"

hallicrafters

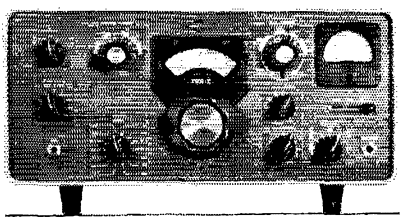
5th & Kostner Aves., Chicago, Ill. 60624

Export: International Div., Hallicrafters.
Canada: Gould Sales Company, Montreal, P. Q.



GOT EVERYTHING?

Don't forget your KWM-2. It's a great traveling companion. Helps relieve the tedium of a long trip and it's so easy to take along. Mounts quickly and easily in a mobile mount in your car. Gives you the same performance you get in your ham shack. At home or on the road, Collins KWM-2 covers the popular HF ham bands. Provides ample power on 80 through 10 meters with 175 watts PEP input on SSB, or 160 watts on CW. You don't have to take a long trip to enjoy the KWM-2. It's so portable you can take it with you on a Sunday ride in the country—or any place else you might be driving. Contact your distributor and ask for a demonstration of the KWM-2—either in the store or in the car. Ask him about price and trade-in value, too. You'll be pleasantly surprised to find out how little it costs to own the finest in amateur radio equipment.



P.S. If you're driving through Iowa this summer, stop in Cedar Rapids during working hours and visit Collins. Contact the Amateur Product Office and we'll be pleased to show you around our facilities.

COLLINS

QST

JULY 1965

VOLUME XLIX NUMBER 7

PUBLISHED MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC. NEWINGTON, CONN., U. S. A.: OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

225 Main Street
Newington, Connecticut 06111
TEL.: 666-1541
Area Code 203

Subscription rate in United States and Possessions, $6.00 per year, postpaid; $6.50 in Canada, $7.00 in all other countries. Single copies, 60 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

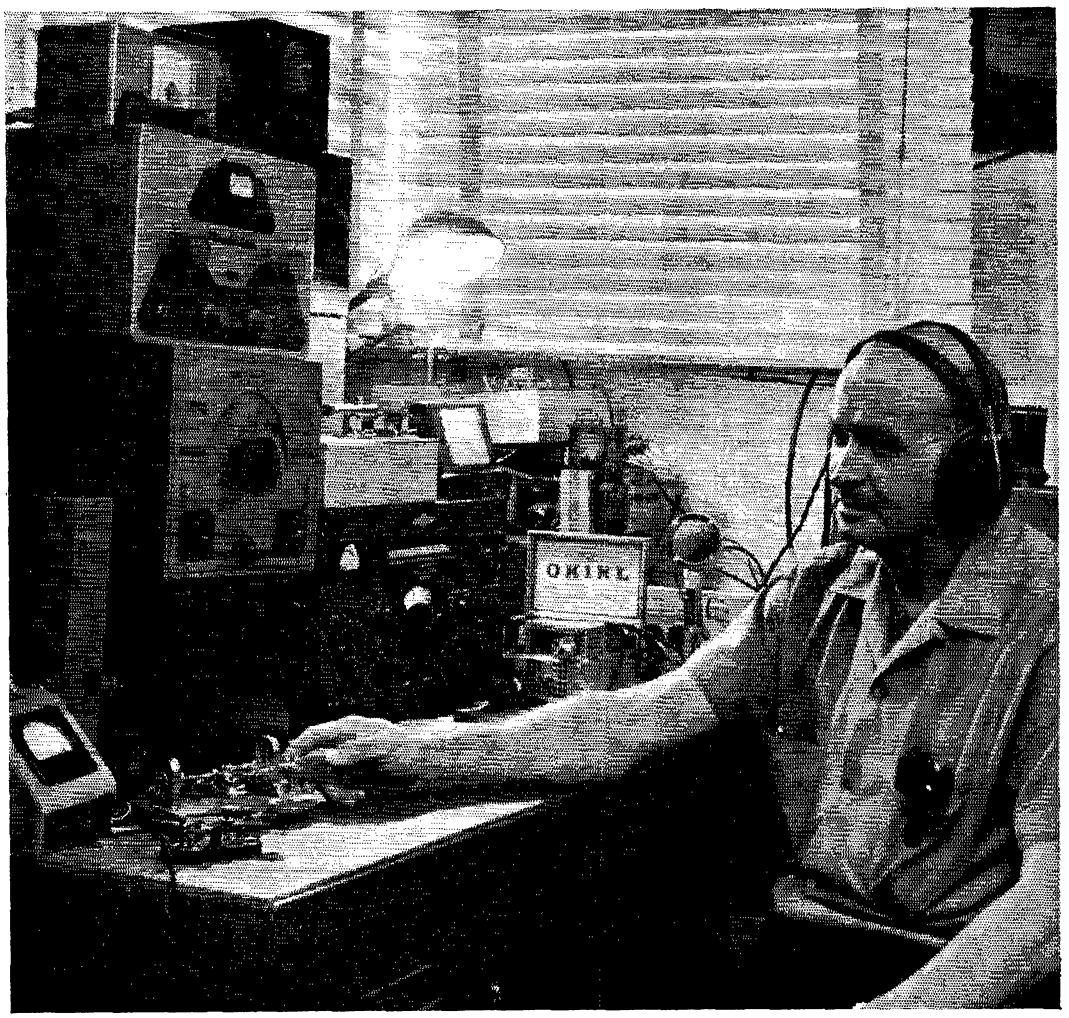
Second-class postage paid at Hartford, Conn. and at additional mailing offices.

INDEXED BY
Applied Science and Technology Index
Library of Congress Catalog
Card No.: 21-9421

—CONTENTS—

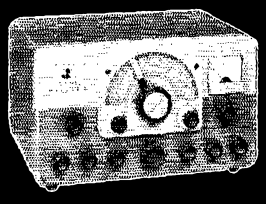
EIMAC salutes W6DNG: first across the Atlantic on 144 Mcs!

On April 11, 1964, W6DNG of Long Beach, California and OH1NL of Nakkila, Finland established two-way 144 Mcs contact via moon-bounce! This record-breaking communication was the result of years of patient effort and experiment. The difficult earth-moon-earth path was successfully conquered by a combination of radio amateur "know-how," enthusiasm, and state-of-the art equipment. High gain antennas, low noise narrow-band receivers and a reliable kilowatt transmitter using Eimac 4CX250B's joined with VHF experience to break the VHF communication barrier between Europe and North America. Eitel-McCullough joins the A.R.R.L. and all radio amateurs in saluting W6DNG and OH1NL: two radio amateur pioneers, blazing a trail of achievement in long distance VHF communication. Eitel-McCullough, Inc., San Carlos, California. In Europe, you may contact Eitel-McCullough, S.A., 15 rue du Jeu-de-l'Arc, Geneva, Switzerland.



RANGER II

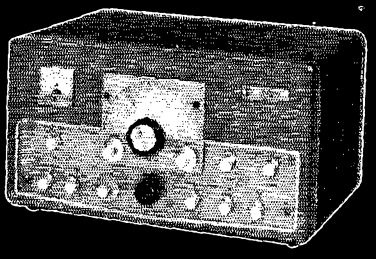
75 WATTS CW
65 WATTS PHONE INPUT!



SLICE THRU Q.R.M.

VALIANT II

275 WATTS CW AND SSB*
200 WATTS PHONE INPUT!



with either of these high performance Viking transmitters

RANGER II—This popular, feature-packed, self-contained transmitter/exciter is available wired and tested or in a complete, easy to assemble kit. As a transmitter, it's a rugged 75 watt CW or 65 watt phone unit—instant bandswitching on 6 through 160 meters—for built-in VFO or crystal control. Temperature compensated VFO is extremely stable—high "Q" pi-network output circuit matches antenna loads from 50 to 500 ohms. Flexible timed sequence keying provides perfect "make" or "break", yet maintains "break-in" advantages of a keyed VFO. As an exciter, without modification, it will drive any of the popular kilowatt level tubes and will provide a high quality speech driver system for high powered modulators. TVI suppressed—with tubes, less crystals.

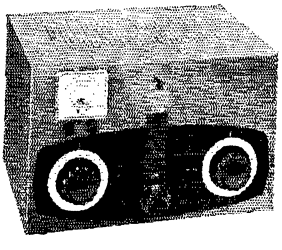
Cat. No. 240-162-1.....**"Ranger II" Kit**.....**Net $249.50**
Cat. No. 240-162-2.....**"Ranger II" Wired**.....**Net $359.50**

*with auxiliary SSB exciter

VALIANT II—Here's the unit that gives you outstanding flexibility and performance in a compact, desktop rig! Low level audio clipping prevents over-modulation and increases modulation level and intelligibility for increased communications power. Differentially temperature compensated VFO is highly stable—operates in the 1.75 to 2 mc. and 7.0 to 7.45 mc. ranges. Other features: Instant bandswitching 160 through 10 meters . . . complete TVI suppression . . . timed sequence (grid block) keying . . . high gain push-to-talk audio system . . . built-in low pass audio filter . . . self contained power supply . . . control mode switching . . . high efficiency pi-network tank circuit. With tubes, less crystals.

Cat. No. 240-105-1.....**"Valiant II" Kit**.....**Net $375.00**
Cat. No. 240-105-2.....**"Valiant II" Wired**.....**Net $495.00**

BOOST YOUR ANTENNA EFFICIENCY!



MATCHBOXES
Bandswitching —no plug-in coils!

Complete integrated antenna matching and switching systems for CW and AM transmitters up to 275 Watts or one Kilowatt. No annoying "plug-in" coils; eliminates "load-tapping". Bandswitching 80 thru 10 meters.

Cat. No.	Amateur Net
250-23-3...275 Watts, with directional coupler and indicator...	$94.95
250-23-1...275 Watts, less directional coupler and indicator...	64.95
250-30-3...1 Kilowatt, with directional coupler and indicator .	154.50

LOW PASS FILTER

Wired, pretuned. Handles more than 1000 Watts RF—75 db or more attenuation of harmonic and spurious frequencies above 54 mc.

Cat. No. 250-20 52 Ohms Impedance.. **$14.95 Net**
Cat. No. 250-35 72 Ohms Impedance.. **$14.95 Net**

DIRECTIONAL COUPLER AND INDICATOR

Provides continuous reading of SWR and relative power in transmission line. May be permanently installed in 52 ohm coaxial line. Easily handles maximum legal power. Wired and tested.

Cat. No. 250-37 ..Coupler.. **$11.75 Net**
Cat. No. 250-38..Indicator..**$25.00 Net**

WRITE TODAY

for your free copy of Catalog 965 with complete specifications and prices on all Johnson Amateur equipment.

E. F. JOHNSON COMPANY
1625 Tenth Ave. S.W. • Waseca, Minnesota 56093

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in areas shown to qualified League members. General or Conditional Class licensees or higher may be appointed ORS, OES, OPS, OO and OBS. Technicians may be appointed OES, OBS or V.H.F. PAM. Novices may be appointed OES. SCMs desire application leadership posts of SEC, EC, RM and PAM where vacancies exist.

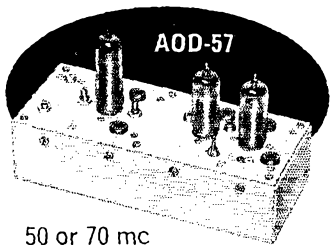
ATLANTIC DIVISION				
Delaware	W3IYE,	Roy A. Belair	415 Brighton Road	Wilmington 19809
Eastern Pennsylvania	W3ZRQ	Allen R. Breiner	212 Race St.	Tamaqua 18252
Maryland-D. C.	W3QA	Bruce Boyd	415 Wickham Rd.	Baltimore, Md. 21229
Southern New Jersey	K2BG	Herbert C. Brooks	800 Lincoln Ave.	Palmyra 08065
Western New York	K2HUK	Charles T. Hansen	211 Rosemont Drive	Buffalo 26
Western Pennsylvania	W3GJY	John F. Wojtklewicz	1490 Chaplin St.	Conway
CENTRAL DIVISION				
Illinois	W9PRN	Edmond A. Metzger	1520 South 4th St.	Springfield 62703
Indiana	W9YYX	Ernest L. Nichols	RFD 7	Bloomington 47403
Wisconsin	K9GSC	Kenneth A. Ebneter	822 Wauona Trail	Portage 53901
DAKOTA DIVISION				
Minnesota	WØTCK	Herman R. Kopischke, Jr.,	RFD 2	Janesville 56048
North Dakota	WØDM	Harold L. Sheets	21 Euclid Ave.	Grand Forks
South Dakota	KØTXW	Steward P. Holt	Box 58	Clear Lake
DELTA DIVISION				
Arkansas	W5DTR	Curtis R. Williams	Route 3, Box 230	Little Rock 72205
Louisiana	W5PM	J. Allen Swanson, Jr.	RFD 1, Box 354-E	Covington
Mississippi	W5EMM	S. H. Hairston	2321-27th Ave.	Meridian
Tennessee	W4UVP	William Scott	115 East Holston Ave.	Johnson City 37601
GREAT LAKES DIVISION				
Kentucky	K4QIO	Mrs. Patricia C. Schafer	732 Greenridge Lane	Louisville 7
Michigan	W8FX	Ralph P. Thetreau	27209 W. Six Mile Road	Detroit 48240
Ohio	W8AL	Wilson E. Weckel	1317 Logan Ave., N.W.	Canton 44703
HUDSON DIVISION				
Eastern New York	W2EFU	George W. Tracy	1138 North Country Club Drive	Schenectady
N. Y. C. & Long Island	K2IDB	Blaine S. Johnson	266 Cypress St.	Massapequa Park, L. I.
Northern New Jersey	W2CVW	Edward F. Erickson	13 Robert Circle	South Amboy 08879
MIDWEST DIVISION				
Iowa	WØNTB	Dennis Burke	1418 Douglas Ave.	Ames 50010
Kansas *	KØBXF	Robert M. Summers	1125 N. 50th Pl.	Kansas City
Missouri	WØTPK	Alfred E. Schwaneke	Edgar Star Rte	Rolla 65401
Nebraska	WØGGP	Frank Allen	Box 272	Gering 69341
NEW ENGLAND DIVISION				
Connecticut	K1GGG	Fred Tamm	28 Gresham St.	Milford
Eastern Massachusetts	W1ALP	Frank L. Baker, Jr.	85 Solar Ave.	Braintree 02185
Maine	K1DYG	Herbert A. Davis	Lakes Ln.	Ellsworth Falls 04634
New Hampshire W1SWX/	K1DSA	Robert Mitchell	Box 137-A, RFD	Chester
Rhode Island	K1AAV	John E. Johnson	30 Fruit St.	Pawtucket 02860
Vermont	K1MPN	E. Reginald Murray	3 Hillcrest Drive	Montpelier 05601
Western Massachusetts	W1BVR	Percy C. Noble	8 St. Dennis St.	Westfield 01085
NORTHWESTERN DIVISION				
Alaska *	KL7ENT	Daniel R. Wright	512 E. 9th Ave.	Anchorage
Idaho	K7IILR	Raymond V. Evans	Route 3	Twin Falls 83301
Montana	W7TYN	Joseph A. D'Arcy	1918 Haggin Ave.	Anaconda
Oregon	W7AJN	Everett H. France	3335 S.E. 116th Ave	Portland 97266
Washington	W7HMQ	Everett E. Young	2217 Fifth St., S.E.	Puyallup
PACIFIC DIVISION				
East Bay	K6LRN	Richard Wilson	107 Cordova Way	Concord
Hawaii	KH6BZF	Lee R. Wical	45-601 Luluku Rd.	Kaneohe 96744
Nevada	W7PBV	Leonard M. Norman	852 Utah St.	Boulder City 89005
Sacramento Valley	WA6JDT	John F. Minke, III	4613 Rustic Rd.	Carmichael 95608
San Francisco	WA6AUD	Hugh Cassidy	77 Coleman Drive	San Rafael 94901
San Joaquin Valley	W6JPU	Ralph Saroyan	6204 E. Townsend Ave.	Fresno
Santa Clara Valley	W6ZRJ	Jean A. Gmelin	10835 Willowbrook Way	Cupertino
ROANOKE DIVISION				
North Carolina	W4BNU	Barnett S. Dodd	420 West Franklin St.	Salisbury 28144
South Carolina	W4PED	Charles N. Wright	711 Merriwether Dr.	North Augusta 29841
Virginia	W4SHJ	H. J. Hopkins	8600 Hammett Ave.	Norfolk 23503
West Virginia	W8JM	Donald B. Morris	1136 Morningstar Lane	Fairmont 26554
ROCKY MOUNTAIN DIVISION				
Colorado	KØTTB	Donald Ray Crumpton	P.O. Box 223	Alamosa
New Mexico	W5UBW	Lowell Richardson	1518 Lincoln Ave.	Alamogordo
Utah W7MWR/	W7OAD	Marvin C. Zitting	P.O. Box 1813	Salt Lake City 84110
Wyoming	W7CQL	Wayne M. Moore	142 South Montana Ave.	Casper 82601
SOUTHEASTERN DIVISION				
Alabama	K4KJD	William S. Crafts	Route 3, Box 233	Athens 35611
Canal Zone	KZ5TD	Thomas B. DeMets	P.O. Box 1111	Balboa
Eastern Florida	K4SJH	A. L. Hamel	220 N.E. 25th St.	Pompano Beach 33064
Georgia	W4RZL	Howard L. Schonher	P.O. Box 1902	Columbus 31902
West Indies (P.R.-V.I.)	KP4JM	Jose E. Saldaña	Box 223	Hato Rey, P.R.
Western Florida	W4RKH	Frank M. Butler, Jr.	494 Elliott Rd.	Fort Walton Beach 32548
SOUTHWESTERN DIVISION				
Arizona	W7FKK	Floyd C. Colyar	3411 West Pierson St.	Phoenix 85017
Los Angeles	W6BHG	H. G. Garman	3732 Chatwin Ave.	Long Beach 90808
Orange	W6DEY	Roy R. Maxson	1434 South Olive St.	Santa Ana 92707
San Diego	W6LRU	Don Stansifer	4427 Pescadero	San Diego 92107
Santa Barbara	WA6OKN	Cecil D. Hinson	1933 Coventry Court	Thousand Oaks
WEST GULF DIVISION				
Northern Texas	W5BNG	L. L. Harbin	4515 Calmont	Fort Worth 76107
Oklahoma	K5KTW	Bill F. Lund	1220 S. Owasso	Tulsa 74120
Southern Texas	W5AIR	G. D. Jerry Sears	5634 Eskridge St.	Houston
CANADIAN DIVISION				
Alberta	VE6TG	Harry Harrold	1834-5th Ave. N.	Lethbridge, Alta.
British Columbia	VE7FB	H. E. Savage	4553 West 12th Ave.	Vancouver 8, B. C.
Manitoba*	VE4JY	M. S. Watson,	249 Lanark St.	Winnipeg 9
Maritime	VE1WB	D. E. Weeks		Harvey Station, N. B.
Ontario	VE3NG	Richard W. Roberts	170 Norton Ave.	Willowdale, Toronto, Ont.
Quebec	VE2DR	C. W. Skarstedt	62 St. Johns Rd.	Pointe Claire, Montreal 33, P. Q.
Saskatchewan	VE5QC	Mel Mills	P.O. Box 801	Saskatoon

* Official appointed to act temporarily in the absence of a regular official

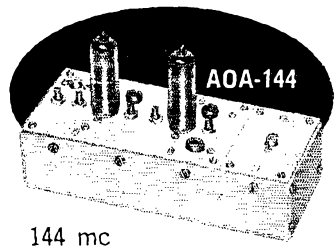
NEW FROM INTERNATIONAL

VHF/UHF UNITIZED TRANSMITTERS 50 mc—420 mc

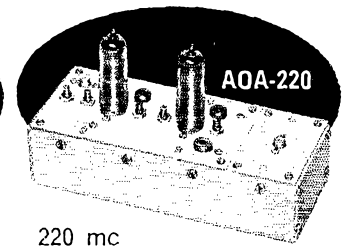
International's new unitized VHF/UHF transmitters make it extremely easy to get on the air in the 50-420 mc range with a solid signal. Start with the basic 50 or 70 mc driver. For higher frequencies add a multiplier-amplifier. All units are completely wired. Plug-in cables are used to interconnect the driver and amplifier.



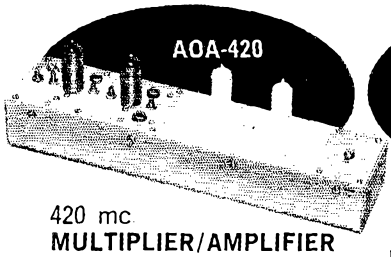
50 or 70 mc
DRIVER/TRANSMITTER
The AOD-57 completely wired with one 6360 tube, two 12BY7 tubes and crystal (specify frequency). Heater power: 6.3 volts @ 1.2 amps. Plate power: 250 vdc @ 50 ma.
AOD-57 complete.....$69.50



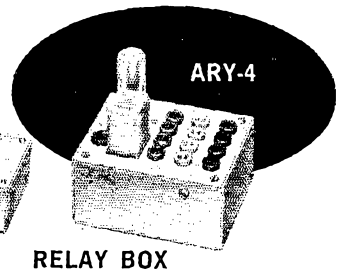
144 mc
MULTIPLIER/AMPLIFIER
The AOA-144 uses two 6360 tubes providing 6 to 10 watts output. Requires AOD-57 for driver. Heater power: 6.3 volts @ 1.64 amps. Plate power: 250 vdc @ 180 ma.
AOA-144 complete.....$39.50



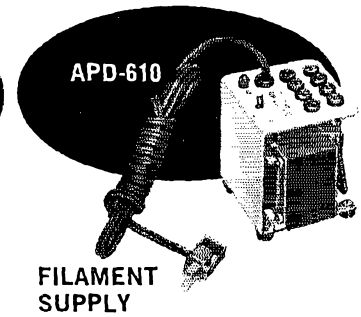
220 mc
MULTIPLIER/AMPLIFIER
The AOA-220 uses two 6360 tubes providing 6 to 8 watts output on 220 mc. Requires AOD-57 for driver. Heater power: 6.3 volts @ 1.64 amps. Plate: 250 vdc @ 150 ma.
AOA-220 complete.....$39.50



420 mc
MULTIPLIER/AMPLIFIER
The AOA-420 uses two 6939 tubes providing 4 to 8 watts output on 420 mc. Requires AOA-57 plus AOA-144 for drive. Heater: 6.3 volts @ 1.2 amps. Plate: 220 vdc @ 130 ma.
AOA-420 complete.....$69.50



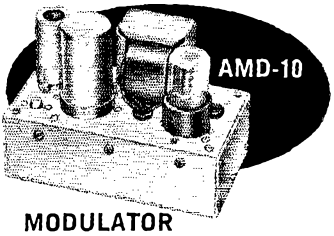
RELAY BOX
Four circuit double throw. Includes coil rectifier for 6.3 vac operation.
ARY-4 Relay Box complete $12.50



FILAMENT SUPPLY
The APD-610 provides 6.3 vac @ 10 amperes.
APD-610 complete.....$9.50

COMPLETE TRANSMITTER

6 METERS	50 mc	AOD-57
2 METERS	144 mc	AOD-57 PLUS AOA-144
	220 mc	AOD-57 PLUS AOA-220
	420 mc	AOD-57 PLUS AOA-144 PLUS AOA-420



MODULATOR
The AMD-10 is designed as a companion unit to the AOA series of transmitters. Uses 6AN8 speech amplifier and driver, 1635 modulator. Output: 10 watts. Input: crystal mic. (High Imped.) Requires 300 vdc 20 ma, no signal, 70 ma peak: 6.3 vac @ 1.05 amps.
AMD-10 complete $24.50

INTERNATIONAL CRYSTAL MFG. CO. INC.
18 NORTH LEE — OKLA. CITY, OKLA.

Order Direct from International

THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at Newington, Connecticut.

Past Presidents

HIRAM PERCY MAXIM, W1AW, 1914–1936
EUGENE C. WOODRUFF, W8CMP, 1936–1940
GEORGE W. BAILEY, W2KH, 1940–1952
GOODWIN L. DOSLAND, W8TSN, 1952–1962
(President Emeritus)

Officers

President . . . . . HERBERT HOOVER, JR., W6ZH
900 Wilshire Blvd., Los Angeles, California 90017

First Vice-President . . . . WAYLAND M. GROVES, W5NW
1406 West 12th Street, Odessa, Texas 79761

Vice-President . . . . . FRANCIS E. HANDY, W1BDI
225 Main St., Newington, Connecticut 06111

Vice-President . . . . . ALEX REID, VE2BE
240 Logan Ave., St. Lambert, P. Q., Canada

Secretary . . . . . JOHN HUNTOON, W1LVQ

Treasurer . . . . . DAVID H. HOUGHTON
225 Main St., Newington, Connecticut 06111

• • • • •

Secretary & General Manager Emeritus, A. L. BUDLONG, W1BUD

• • • • •

General Manager . . . . . JOHN HUNTOON, W1LVQ

Communications Manager . . . . FRANCIS E. HANDY, W1BDI

Technical Director . . . . . GEORGE GRAMMER, W1DF

Assistant General Manager . RICHARD L. BALDWIN, W1IKE

Assistant Secretaries . . . . . PERRY F. WILLIAMS, W1UED
RAYMOND HIGGS, K1FLG . . . GARY L. FOSKETT, W1ECH
225 Main St., Newington, Connecticut 06111

• • • • •

General Counsel . . . . . ROBERT M. BOOTH, JR., W3PS
1100 Vermont Avenue, N. W., Washington, D. C. 20005

Associate Counsel . . . . . ARTHUR K. MEEN, VE3RX
Suite 2212, 44 King St. West, Toronto 1, Ont.

DIRECTORS

Canada

NOEL B. EATON VE3CJ
R.R. 3 Burlington, Ontario

Vice-Director: Colin C. Dunbrille VE2BK
116 Oak Ridge Drive, Baie d'Urfee, Quebec

Atlantic Division

GILBERT L. CROSSLEY W3YA
734 West Foster Avenue, State College, Pa. 16801

Vice-Director: Edwin S. Van Deusen W3ECP
3711 McKinley St., N.W., Washington, D.C. 20015

Central Division

PHILIP E. HALLER W9HPG
6000 S. Tripp Ave., Chicago, Ill. 60629

Vice-Director: Edmond A. Metzger W9PRN
1520 South Fourth St., Springfield, Illinois 62703

Dakota Division

CHARLES G. COMPTON W0BUO
1011 Fairmount Ave., St. Paul, Minn. 55105

Vice-Director: Charles M. Bove W0MXC
1611½ East Lake St., Minneapolis, Minn. 55407

Delta Division

PHILIP P. SPENCER W5LDH/W5LXX
29 Sulpe St., Lake Vista, New Orleans, La. 70124

Vice-Director: Franklin Cassen W4WBK
925 North Trezevant St., Memphis, Tenn. 38108

Great Lakes Division

DANA E. CARTWRIGHT W8UPB
2979 Observatory Ave., Cincinnati, Ohio 45208

Vice-Director: Charles C. Miller W8JSU
4872 Calvin Drive, Columbus, Ohio 43227

Hudson Division

HARRY J. DANNALS W2TUK
RFD 1, Arbor Lane, Dix Hills, Huntington, N.Y. 11743

Vice-Director: Stan Zak K2SJO
13 Jennifer Lane, Port Chester, New York 10573

Midwest Division

ROBERT W. DENNISTON W0NWX
Box 73, Newton, Iowa 50208

Vice-Director: Sumner H. Foster W0GQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa 52403

New England Division

ROBERT YORK CHAPMAN W1QV
28 South Road, Groton, Conn. 06340

Vice-Director: Bigelow Green W1BAE
236 Marlboro St., Boston, Mass. 02116

Northwestern Division

ROBERT B. THURSTON W7PGY
7700 31st Ave., N.E., Seattle, Wash. 98115

Vice-Director: R. Rex Roberts W7CPY
837 Park Hill Drive, Billings, Mont. 59102

Pacific Division

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose, Calif. 95126

Vice-Director: Ronald G. Martin W6ZF
1573 Baywood Lane, Napa, Calif. 94558

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va. 24541

Vice-Director: Joseph F. Abernethy W4AKC
764 Colonial Drive, Rock Hill, S.C. 29730

Rocky Mountain Division

CARL L. SMITH W0BWJ
1070 Locust St., Denver, Colo. 80220

Vice-Director: John H. Sampson, Jr. W7OCX
3618 Mount Ogden Drive, Ogden, Utah 84403

Southeastern Division

THOMAS M. MOSS W4HYW
P.O. Box 578, East Point, Ga. 30044

Vice-Director: Charles J. Bolvin W4LVV
2210 S.W. 27th Lane, Miami, Fla. 33133

Southwestern Division

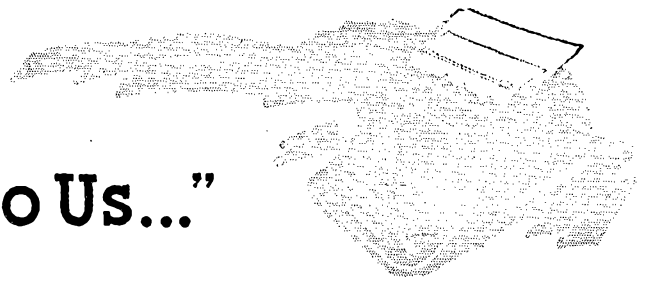
HOWARD F. SHEPHERD, JR. W6QJW
127 South Citrus Avenue, Los Angeles, Calif. 90036

Vice-Director: John F. Martin W6ECP
1135 Crest Drive, Encinitas, Calif. 92024

West Gulf Division

ROEMER O. BEST W5QKF
P.O. Box 1656, Corpus Christi, Texas 78403

Vice-Director: Ray K. Bryan W5UYQ
2117 S.W. 61st Terrace, Oklahoma City, Okla. 73159



"It Seems to Us..."

THE CONVERSATIONAL ART

Each night's operation is a new adventure into space. An amateur's station . . . becomes a modern Aladdin's lamp. You never know, when you sit down to your transmitter and receiver for a few hours' operation at the end of a day's work, what those hours will bring. Perhaps, to start, a few friendly chats with amateurs in nearby states . . . following this there may be an opportunity to pass the time of day with a Virgin Islander . . .

The most enjoyment may come from getting together with a crowd of good fellows and talking over everything under the sun. Amateur radio is full of confirmed addicts to the conversational art; indeed, there is even a "Rag-Chewer's Club" . . . for those who can qualify.

This is what a newcomer to amateur radio reads. This, if you didn't recognize it, is from *How to Become a Radio Amateur*, published by the ARRL. The section just quoted tells about the lure of amateur radio, what it does and its objectives.

I believed this when I first looked into ham radio. I believed it until I got my General. Then I rapidly became disillusioned. Take the first part, "you never know what these hours will bring." True, I don't know whether I will talk to a ham in Ohio, Idaho, or Morocco. But I will be assured of one thing: the exact same conversation will transpire with each one. Each one will tell me I'm a "FB 579". Each one will tell me his town. Each one will tell me his name. Each one will neglect to tell me about my a.c. ripple. Each one will say "I won't hold you Craig OB . . . real FB QSO CUL DX 73 SK." Each QSO will be a crashing bore. And the chances are quite excellent that I won't get a QSL either. Am I talking to a man? A boy? A grandfather? Or a tape recorder? I'll never know.

Then again, maybe this is a little unfair. There are some rag-chewers around. They don't sign off immediately. First, they send the weather (cool and cldy) and their rig (usually factory built). Then they sign off. They might even let a QSO go more than two transmissions apiece. Maybe even three. Of course, they only do that when the DX isn't coming in.

But how can this be? The ARRL clearly says "Amateur Radio is full of confirmed addicts of the conversational art." Or is it?

People frequently ask me what I talk about with my "radio set". It is highly embarrassing to give an answer. How can I say "nothing"? How can I say "they tell me how my signal is and then they sign off"? This is what the public hears about ham radio, from hams themselves. Yet everybody is wondering, "gee, why doesn't ham radio have good public relations"?

But all is not lost; there is always a DX station waiting to be worked. As the ARRL says, "there may be an opportunity to pass the time of day with a Virgin Islander". What an excellent way to learn about foreign countries and their customs. I had a QSO with a Virgin Islander once. He told me I was 579, he lived in St. Croix, and I could QSL via his QSL manager. He then graciously allowed me to give a final, but to make sure that he wouldn't be obligated to come back to me he sent a nice long string of 73. So this is how to pass the day. Unfortunately this happens with every DX station. Wait . . . credit where credit is due. Once I had an excellent rag-chew that lasted a half hour with PY3BOQ. It would have lasted longer, but the "break-breaks" from other stations got to be too much.

One ham magazine stated "you can work at peak openings, three a minute on s.s.b. if you cut the trimmings — treat it like a contest." Great — just the way to learn about the people from other countries, broaden your field, and become a well-educated person. How much can anybody say in 20 seconds?

(Continued on page 10)

Seldom does QST run a guest editorial. But then seldom do we receive a piece so effectively pointing up one of our amateur shortcomings. We hope that these comments from Craig Anderton, WB2JQC, will nettle those far-too-many of us who fail to take full advantage of the tremendous good-will and people-to-people opportunities in our daily communications activities.

(Continued from page 9)

What a pity. Some day hams might recognize the tremendous potential and place international peace and understanding above the selfish greed to have a cheap paper certificate. Amateur radio is allotted precious frequency space, a natural resource that commercial interests regard as priceless. A ham rig is twice as much fun as a telephone, more personal than a letter, cheaper than a tape club, infinitely easier than taking trips abroad. It is available to practically everyone. It is relatively inexpensive. It has the best potential of any existing medium today. It could be a tremendous asset to goodwill between nations, fostering peace and friendship. We have only to make it so.

H-A-M

About a dozen years ago we noted an article in the *New York Physician* by a doctor, purporting to describe the origin of the term "ham" as coming from the last-name initials of three young amateur wireless operators who manned a joint station up Boston way about 1910. The tale is still repeated from time to time in various amateur publications and club bulletins, and occasionally in newspaper stories. Unfortunately, we cannot confirm that it is true. In the original story, none of the various mentions of Congressional hearings, names and terms of Senators, the Harvard Wireless Club, newspaper clippings, etc., are confirmed by documentation; indeed there are serious conflicts.

It is a delightful story, much more glamorous for a newspaperman researching ham radio's background than the probable truth (a novice or poor operator on the old landline telegram system was a "ham"). But it doesn't check out. Unless and until it does, it must be labeled a myth. QST

COMING A.R.R.L. CONVENTIONS

July 2–5 — ARRL National, San Jose, California
July 3–4 — West Virginia State, Jackson's Mill
July 9–11 — West Gulf Division, Oklahoma City, Oklahoma
July 17–18 — Rocky Mountain Division, Denver, Colorado
July 17–18 — Hawaii State, Honolulu
September 4–5 — Maritime Province, Digby, Nova Scotia
October 1–3 — Ontario Province, Sudbury
January 22–23, 1966 — Southeastern Division, Miami, Florida

ROCKY MOUNTAIN DIVISION CONVENTION

Denver, Colorado — *July 17–18*

The 1965 Rocky Mountain Division ARRL Convention will be held Saturday and Sunday, July 17 and 18, at the Centre Denver Motel, Denver, Colorado. A coffee bar will be open from 7:00 to 9:00 P.M. Friday for early arrivals, and W0OUI will be active on 80, 40 and 20 meters, to guide mobiles in.

The ARRL Open Forum Saturday afternoon will be conducted by ARRL General Counsel Robert M. Booth, Jr., W3PS. One of the principal banquet speakers will be Major General John B. Bestic, K4BMR, Deputy Director for National Military Command Systems, Defense Communications Agency. Lew McCoy, W1ICP, of ARRL Hq., will present slide-talks entitled "How to Succeed In Amateur Radio Without Really Trying" and "Transmission Lines And Antennas". A Royal Order of the Wouff Hong initiation ceremony is planned for Saturday evening. Other activities include a breakfast for licensed YLs, MARS meetings, transmitter hunts, left-footed and speed c.w. contests and FCC-administered General and Extra Class amateur examinations. A Saturday luncheon is planned for ladies, plus a Sunday trip to the Air Force Academy in Colorado Springs; baby-sitters will be available.

Prior to July 1, advance registrations are $3.00; $4.00 after that date. Other prices: Saturday banquet, $3.75; Sunday luncheon, $3.00; YL breakfast, $2.00; Wouff Hong initiation, $.50. Send registration requests to the Denver Radio Club Convention Committee, P.O. Box 6140, Denver, Colorado 80206. Motel reservations must be handled separately with the Centre Denver Motel, 620 Federal Boulevard, Denver; special convention rates will be in effect.

HAWAII STATE CONVENTION

Honolulu — *July 17–18*

The Hawaii State ARRL Convention will be held at the Kaimanu Hotel in Waikiki, Honolulu, on Saturday and Sunday, July 17 and 18, *not* at the Hilton Hawaiian Village Hotel as previously announced. ARRL Pacific Division Director Harry Engwicht, W6HIC, will be the keynote speaker at the Saturday night banquet; other guests will attend, representing ARRL, MARS, CD and various amateur equipment manufacturers. Several technical talks and XYL activities are scheduled, as well as a number of exhibits and displays.

"Early Bird" registration requests should be sent to Mr. Harris Tarumoto, KH6CUP, Convention Chairman, P.O. Box 2573, Honolulu, Hawaii 96803 by July 10; tickets will also be available at the door. Registration and banquet combined will cost $9 per person or $16 per couple; individual registrations without the banquet are $5. Room reservations or travel arrangements may be made through Convention Travel/Accommodations, Mrs. Anne Murai, Holiday Travel, 1158 Fort Street, Honolulu.

A Transistor Secondary Frequency Standard

Adjustment-Free System Using Binary Division

BY JAMES H. GRIGG,* W9ZQT

This secondary frequency standard eliminates the critical adjustments usually required in a system using a free-running multivibrator for division of the 100-kc. crystal frequency through the use of bistable dividers. Those engaged in frequency measurement or in the establishment of a marker system for the amateur bands should find this article of prime interest.

Most amateur secondary frequency standards are based on the 100-kc. crystal oscillator. Such an oscillator will produce harmonic markers at 100-kc. intervals, and thus provide accurate markers at one or both extremes of many of the amateur bands. To provide markers for the limits of other bands or sub-bands, and to improve resolution and facilitate interpolation, markers at more frequent intervals are required. For these purposes, it is customary to add a device that will divide the 100-kc. crystal frequency to some lower frequency (usually 10 kc.) Markers will then appear at intervals corresponding to harmonic multiples of this lower frequency (at 10-kc. intervals in the case of the 10-kc. divider).[1]

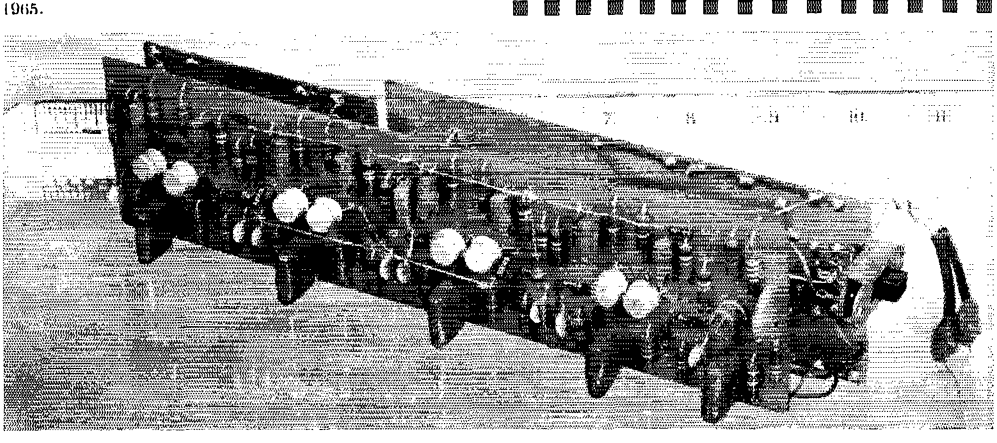
Frequency division can be accomplished in any one of several different ways, but the one most familiar to amateurs is the use of the astable, or free-running, multivibrator.[1] The normally unstable oscillations of the free-running MV are stabilized by coupling in a synchronizing signal from the 100-kc. crystal oscillator. Integral divisions by 10 or more are possible with this system. However, this method poses difficulties in the control of the order of division, and wave form, particularly when transistors are used. Since the astable MV is not actually driven, it can revert to its unstable state if the synchronizing voltage is too small, or be blocked into "squegging" if the synchronizing voltage is too large. Proper operation is dependent on critical adjustments which are not inclined to hold from day to day.

The Bistable Multivibrator

The bistable multivibrator (flip-flop, or binary counter) is somewhat similar to the astable MV, but it will not self-oscillate, and will function only when supplied with driving pulses. It is relatively insensitive to variations in driving voltage and, because of this, it is "adjustmentless." Identical R and C values will

* 4458 North Mozart St., Chicago, Illinois 60625.

[1] Hall, "The KH6EGL Frequency Standard," *QST*, May, 1965.



In this model of the transistor secondary frequency standard the four stages of the decade divider, and the limiter/shape (right-hand end) are assembled on a single card approximately 2¼ by 10 inches in size.

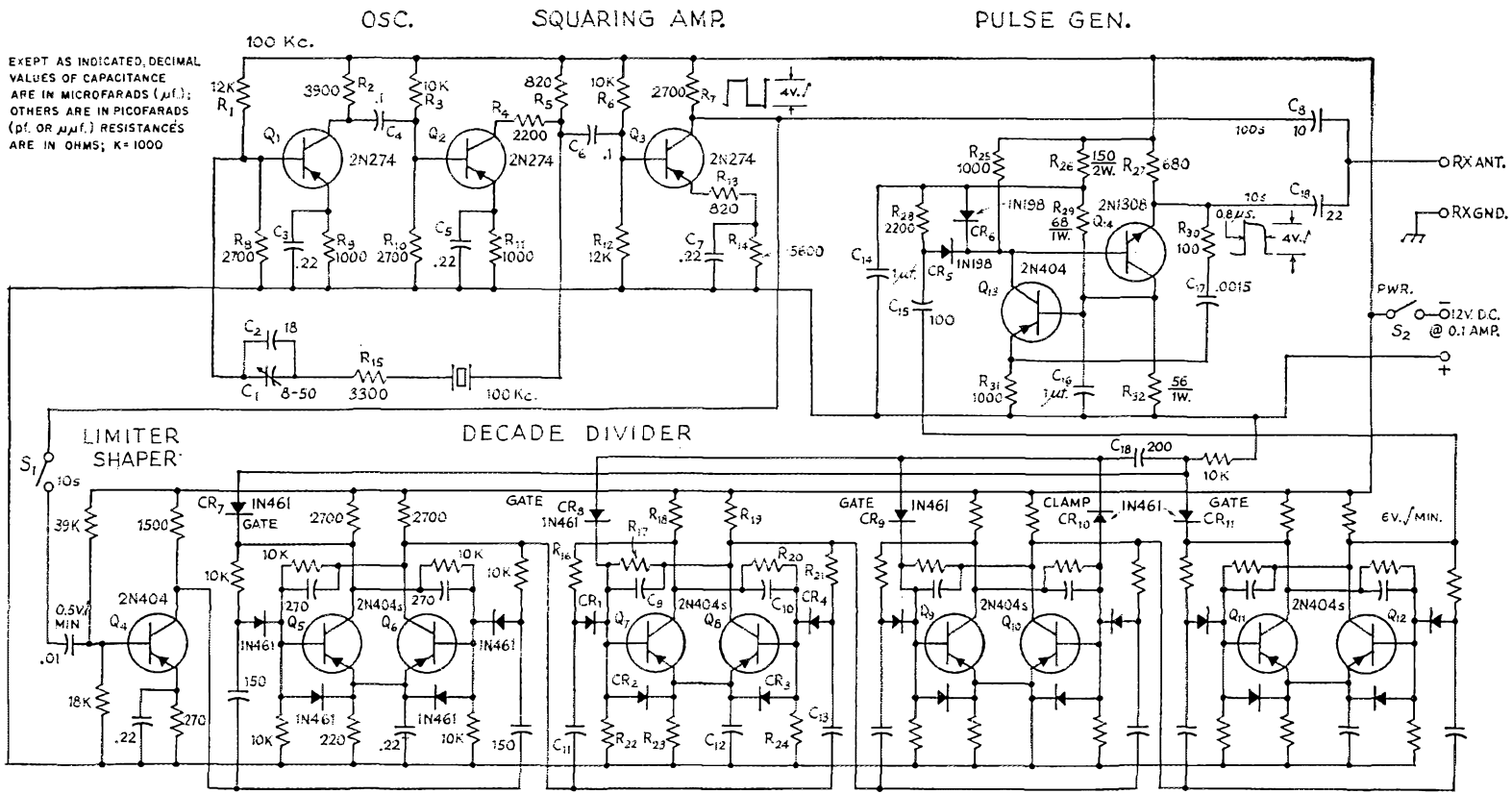


Fig. 1—Circuit of the transistor secondary frequency standard. Circuit values shown for the first binary stage should be duplicated in all following binaries. Notice that CR_7 and CR_{11} are connected at different points in the binaries than are CR_8 and CR_9. Component labels refer to the text, and circuit-board layouts of Figs. 2 and 3. Capacitors of value less than 0.01 μf. should be 10% silver mica or NPO ceramic; others should be paper, mylar or ceramic with guaranteed minimum values as shown. Resistors should be 10%, ½-watt, unless indicated otherwise. C_1 is a ceramic trimmer. The value of C_2 should be selected to center zero beat with WWV at midrange of C_1. Values of C_8 and C_{18} should be selected to give the desired output level, as mentioned in the text. S_1 and S_2 are s.p.s.t. switches, any style. Signal voltages shown are peak-to-peak.

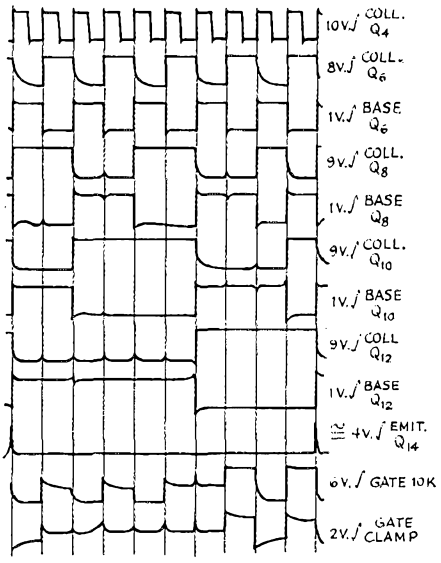


Fig. 2—Characteristic wave forms at various points in the decade divider. The time reference is the pulse-generator output signal. Voltages shown are peak-to-peak.

hold over more than a decade frequency range.

The single binary can perform a division by only 2; a single output pulse results from every two pulses applied at the input. Where further division is necessary, binaries may be used in cascade, each stage producing one output pulse for every two input pulses received from the preceding stage. Thus, three binaries in cascade divide the input frequency by 8, and a four-binary chain divides the input frequency by 16. The limit to binary division occurs when the output is no longer integral kilocycle values. To obtain division by 10, various feedback and/or coincidence-gate circuits have been devised to interrupt the normal sequence within the four-binary chain, and restart at the 11th input pulse. The details of such systems are beyond the scope of this article. Those interested may make use of the references listed at the end of this article.

Circuit

The circuit of a secondary standard using a bistable divider is shown in Fig. 1. The crystal-controlled 100-kc. oscillator is formed in Q_1 and Q_2. A two-stage amplifier with the crystal as a feedback element is used to obtain high gain and accurate control of feedback phase to maintain constant oscillation in spite of the high series resistance characteristic of low-frequency quartz bars. The circuit provides the gain and bias conditions to permit symmetrical swing from saturation to cutoff, thereby giving improved control of dynamic circuit characteristics. Q_3 is an isolating amplifier to provide a signal for line use or for driving the following divider chain. The square-wave output from this amplifier is profuse in harmonics which provide the 100-kc. markers well into the h.f. region when the 100-kc. generator is used alone without the divider.

The signal from the 100-kc. amplifier feeds the limiter/shaper Q_4 which drives the following chain of four binaries. CR_7, CR_8, CR_9 and CR_{11} are coincidence gates. CR_{10} is a clamp which finds a convenient reference in the circuit. The maximum trigger rate of this circuit is 175 kc., and the minimum is less than 10 kc.

Although the output pulses from the divider are rectangular, the harmonic content is limited because of the nearly 50-per-cent duty cycle at a low repetition rate. To provide markers well into the upper end of the h.f. spectrum, the output pulses from the divider trigger a monostable multivibrator, Q_{13}-Q_{14}. The monostable MV also requires a driving pulse to function; it produces one output pulse for every input pulse. The output pulse from the monostable MV is narrow (0.8 microsecond) with a fast rise time (0.08 microsecond), resulting in an output signal rich in harmonics. This MV will trigger and maintain pulse width over a range of pulse-repetition frequencies from 200 cycles to 200 kc.

Signal output levels of the 100-kc. and 10-kc. harmonics can be adjusted by altering the capacitances of C_8 and C_{18}, respectively. With the values shown in Fig. 1, and the coupling between the unit and an NC-300 receiver adjusted to give an S-meter reading of S9 from the 10-kc. marker signal at 30 Mc., there was an increase of 20 db. in the strength of markers over the spectrum down to 1.8 Mc. The variation within any amateur band was less than 1 db.

Fig. 2 depicts characteristic wave forms at various points in the circuit.

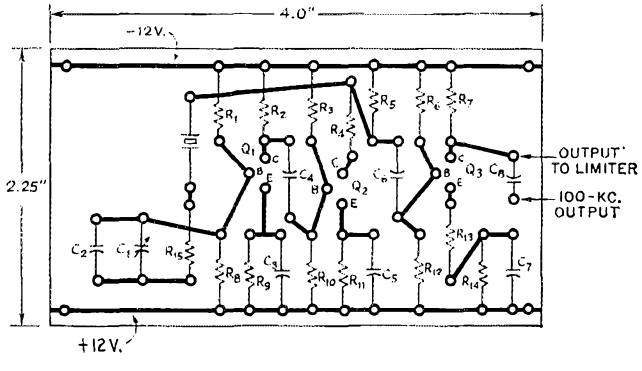
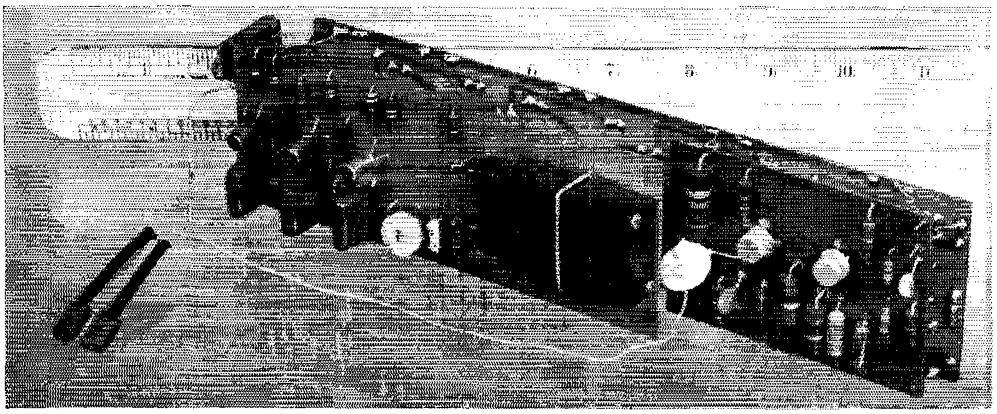


Fig. 3—Circuit-board layout for crystal oscillator and driver. Component labels refer to Fig. 1. Components are mounted on the reverse side of the board.



The larger card at the left contains the 100-kc. crystal oscillator and squaring amplifier. The pulse-generator card is at the right.

Power Supply

The power requirements of the complete unit are minus 12 volts ±5% at 100 ma. The a.c. and d.c. impedances of the supply should be low, which suggests the use of a zener diode or, more ideally, a series regulator. However, if the equipment is used only intermittently, it may be operated from batteries without great expense. Either side of the battery circuit may be grounded.

Construction

Other transistors that may be substituted directly are the 2N2188 for the 2N274, and the type 1309 for the type 404.

The components required for the unit lend themselves well to printed-circuit or perforated-board assembly, as shown in the photographs. Suggested etching patterns are shown in Figs. 3 and 4. The boards may be stacked, or arranged in any other desired configuration.

The cost of the unit, exclusive of cabinet and printed circuit material, was about $45.

Operation

The only adjustments that should be required to place the unit in operation are in coupling the output to the receiver and adjusting the crystal to frequency against a standard such as WWV. Signals may be fed directly to the low-impedance antenna line or, by the very loose coupling, to a high-impedance r.f. or mixer grid. This is a compromise best determined by the user. Care should be taken to avoid component coupling to post-conversion circuits.

It should be obvious that where 10-kc. markers are not required, the divider chain can be reduced to two stages, and the gate diodes omitted, to provide markers at 25-kc. intervals. A single binary stage will provide markers at 50-kc. intervals. In all cases, however, the pulse generator should be utilized to assure uniform harmonic strength at the higher frequencies.

QST

References

Bukstein, *Digital Counters and Computers*, Technical Division, Rinehart & Co., Inc., New York, 1960.

Burroughs Corp., *Digital Computer Principals*, McGraw Hill, New York, 1962.

Malhotra and Parshad, "Transistor Decade Counter," *Electronics*, Feb. 15, 1963.

Meyer, "Arbitrary Length Binary Counters," *Electronics*, December 27, 1963.

Millman and Taub, *Pulse and Digital Circuits*, McGraw-Hill Book Co., Inc., New York, 1956

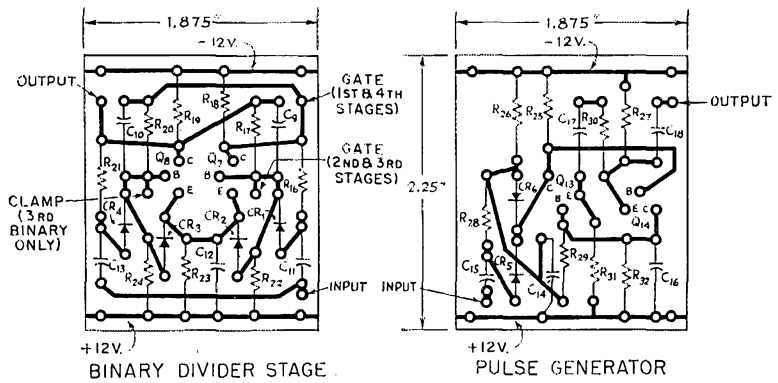


Fig. 4—Pulse-generator and binary circuit-board layouts. The same binary layout is used for each stage in the chain. Component labels refer to Fig. 1. Components are mounted on the reverse side of the board.

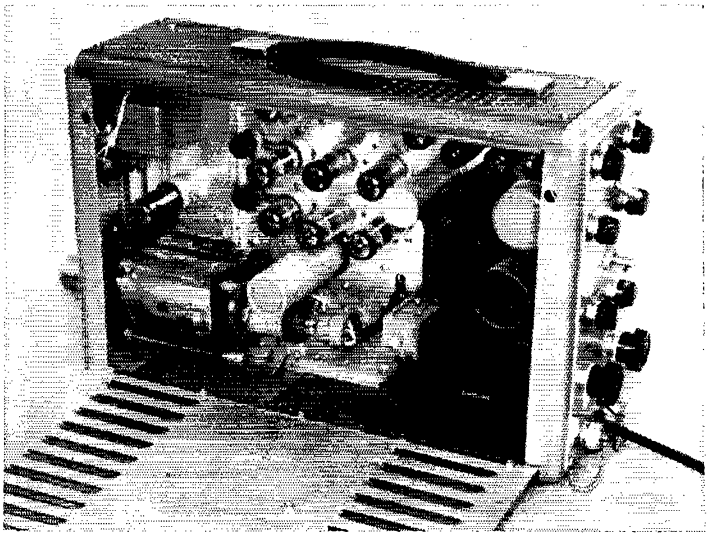


Fig. 1—WA3BTK's slow-scan vidicon camera. Focus/deflection coil assembly holding the pickup tube is at the lower left. Power-supply components are at the right.

A Slow-Scan Vidicon Camera

In Three Parts — Part II

Mechanical Design

BY COPTHORNE MACDONALD,* WA3BTK, EX-WA2BCW

To date, four hams have built cameras with circuitry similar to that described in Part I [1] of this article. In the areas of mechanical design and layout the four cameras are completely different, each man using the materials and facilities at his disposal and designing accordingly. Since the success or failure of a camera project can easily hinge on the mechanical design, and since the later camera designs by Bob Mangold, K3BWW, Bob Gervenack, W7FEN, and Don Miller, W9NTP, have much to offer in the way of improvements on this writer's original packaging job, the main features of each will be discussed.

* Westinghouse Electric Corporation, Electro-Optical Equipment Dept., P.O. Box 10534, Pittsburgh, Pa. 15235.

[1] Part I appeared in June 1965 *QST*.

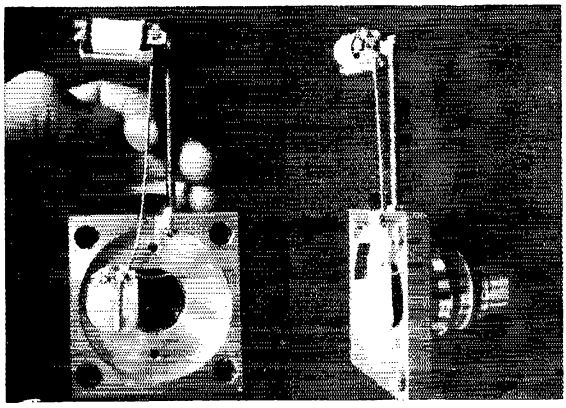


Fig. 2—Two views of the WA3BTK shutter mechanism. The homemade brass shim-stock shutter is actuated by the solenoid and armature from a Potter & Brumfield type PW5LS relay having a 10,000-ohm coil.

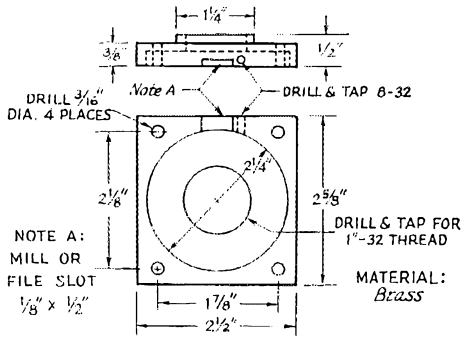


Fig. 3—Dimension drawing of the lens mount for the WA3BTK shutter. It will accept a C-mount lens, and when mounted against the front of the focus coil is at the correct distance from the vidicon target to give proper optical focus.

The WA3BTK Camera

The camera originally built by the writer was housed in the case of an obsolete Dage video switcher unit. The self-contained +300 volt power supply was retained as were the tube sockets and some electrolytic capacitors; the rest of the circuitry was removed. The vidicon yoke-focus coil assembly was mounted at the bottom front of the unit since this was the coolest location. See Fig. 1. It is vital that no heat producing

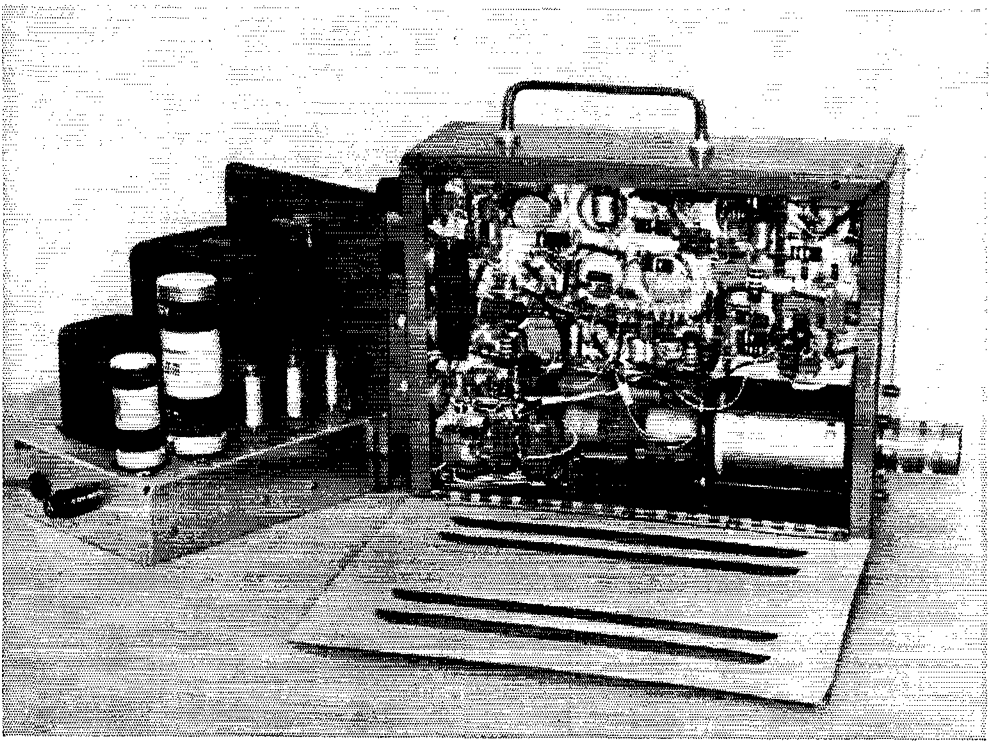


Fig. 4—The K3BWW camera, shown open for access to components. The power supply is built as a separate unit to isolate the camera from the heat the supply generates.

components be placed under the focus-coil assembly and that hot air does not circulate around the assembly, since the vidicon will not operate at its best above about 100°F. and will be permanently damaged if the temperature rises above 113°F.

The preamp input tube, V_{13}, is mounted close to the front end of the focus coil. An inch or two of shielded hook-up wire connects the target side of C_1 with the focus-coil vidicon target contact. The first-stage lead dress was watched to minimize pickup from the 10-kc. multivibrator located at the rear of the camera; even so, without the sides fastened up, pickup is excessive. In this regard, it is also essential to shield the vidicon grid No. 1 lead right up to the vidicon socket; the only path for the 10-kc. chopping waveform to pass from V_{11} to V_{13} should be through the vidicon itself.

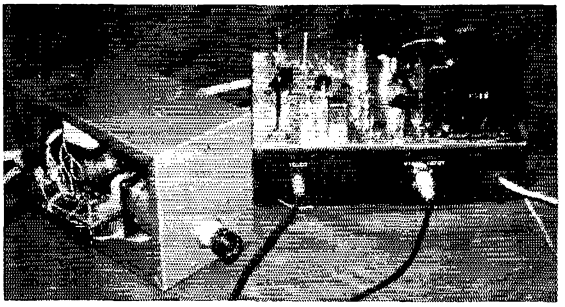


Fig. 5—W7FEN used still another physical arrangement in his camera. The pickup unit, left, contains only the vidicon, its associated components, and the video amplifier.

The shutter mechanism is shown in Figs. 2 and 3. The relay mechanism can be removed from its can by heating the solder seal around the base *rapidly* with a hot, high-wattage soldering iron or fine torch flame, and pulling the can and base apart with two pairs of pliers. The operation should be performed quickly to avoid overheating the relay mechanism. Once the cover is off, the electrical contacts and the 7-pin base should be removed. The armature should be bent up slightly to give greater angular rotation when the relay is actuated. A piece of 18-gauge copperweld wire soldered to the armature serves to increase the lever arm considerably. (A light-weight plastic rod attached with epoxy could be substituted for the wire). A piece of 3-mil thick shim brass soldered to the other end of the wire acts as the shutter diaphragm. Short pieces of wire soldered to the brass diaphragm serve as stops and also act to stiffen the diaphragm. The 1 inch/32 hole in the lens mount accommodates any "C-mount" 16-mm. movie camera lens. Since the weight of the focus coil makes it undesirable to mount the coil by one plastic end plate alone, four pieces of threaded 8-32 brass rod with nuts on both sides of the back plate were used to provide a sturdy mounting arrangement.

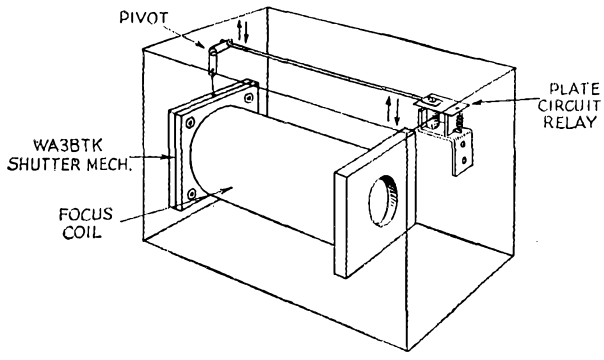


Fig. 6—The shutter used by W7FEN is similar to WA3BTK's, but is operated by a long throw and pivot arrangement that greatly multiplies the mechanical travel of the relay armature.

As Fig. 1 shows, the relay coil was mounted next to T_2. The magnetic field from the relay coil initially induced voltage transients in the secondary of T_2 and also displaced the vidicon scanning beam slightly when energized. Two layers of 5-mil mumetal sheet wrapped around the coil solve the problems. Since mumetal sheet is not normal ham shack stock, a better solution would be to move the relay coil nearer the top of the camera housing and to locate T_2 and associated components several inches from the relay coil.

The power transformer in this camera was an additional source of trouble; 60-cycle magnetic fields produced a slight waviness of horizontal lines in the transmitted picture. More disturbing, however, was the heat generated by the transformer and other power supply components. Some parts in the camera were too hot to touch after a few hours operation, and some drifting of electrical adjustments was the natural result.

K3BWW's Camera

Bob Mangold's camera is shown in Fig. 4. Bob's answer to the heat problem was to put the circuitry into two units; the power supply in one, and the remainder of the circuitry in the other. A Bud WA-1540 Portacab was used to house the power supply.

The camera case was made of bent and riveted 1/16-inch aluminum. This very professional-looking cabinet shows the type of construction possible if one has access to the proper tools for sheet metal work.

W7FEN's Camera

Gervie's camera departs from the original design in several respects. His camera unit contains only the video amplifier and detector in addition to the vidicon and associated components. This results in a very cool-running head in spite of the fact that the Bud CU-1099 utility-box cabinet has no ventilating louvers or holes. His shutter mechanism (Fig. 6) is also different. He uses a standard plate-circuit relay mounted at the rear of the cabinet in conjunction with a very long lever-arm arrangement to get the necessary shutter blade travel.

The rest of the circuitry is mounted on a Bud CA-1228 amplifier foundation. Video detector output and vidicon grid No. 1 connections between the units are made with 52-ohm coax, using two different types of connectors to prevent accidental interchanging. The rest of the leads are fed through a cable terminated with 11-pin Amphenol connectors.

W9NTP's Camera

Don Miller's camera is shown in Fig. 8. By hinging two Premier 17 × 10-inch chassis and mounting the parts on Vector-board, Don comes up with a very neat looking yet simple-to-build package. Note the ventilating holes in top and bottom as well as the luggage-type clasp to hold the two chassis bases together.

Lens Selection

If the lens mount is threaded with a 1 inch/32 thread it will accept any standard C-mount 16-mm. movie camera lens. For shuttered operation with normal room illumination the lens should have a maximum opening of f/1.9 or, even better, f/1.4. The recent trend to automatic iris control on movie cameras has led to much trading-in of older 16-mm cameras. Used lenses and even complete cameras can often be found for less than $25. Any focal-length f/1.9 lens can be used for any given field of view if one is free to select his lens-to-subject distance. With the raster size used in the vidicon in this camera (5/16 × 5/16 inches) the relationships in Table 1 apply. For example, if one wanted the image of a 2-foot-wide object to fill the screen he would set his lens-to-subject distance at 6 feet if using a 25-mm. lens.

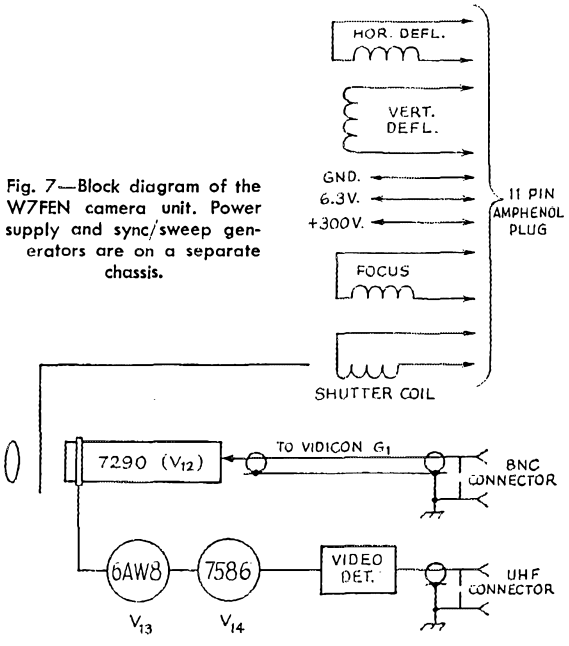


Fig. 7—Block diagram of the W7FEN camera unit. Power supply and sync/sweep generators are on a separate chassis.

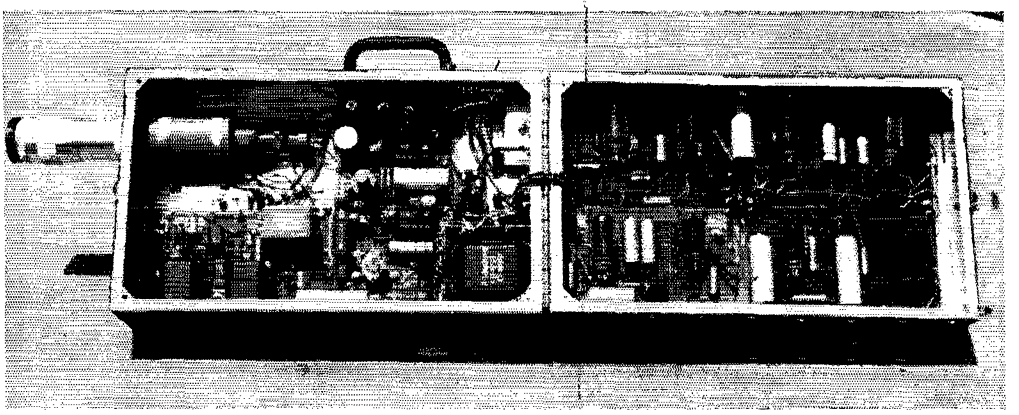


Fig. 8—The camera built by W9NTP uses two chassis hinged together to make the complete enclosure. This arrangement is easy to build and makes all parts readily accessible.

The concluding section of this article, Part III, will describe the checkout and adjustment procedure necessary to get the camera operating properly.

To stimulate amateur experimentation with slow-scan TV, the Electronic Tube Division of Westinghouse Electric Corporation supplied operable reject 7290 vidicons to the four hams whose cameras are described in this article. Requests for such a tube by others will be considered on an individual basis. The number of tubes available is limited and varies from time to time. Tubes will be distributed only to amateurs who have demonstrated interest and ability in this field by previously building a slow-scan monitor and flying-spot scanner, and who state a willingness to spend the $200 or more needed to build the camera itself. Individuals receiving tubes will be required to sign a statement assuring that the tube will not be sold or put into commercial use.

Requests for a tube should be addressed to:

C. Macdonald, WA3BTK
P. O. Box 62,
Murrysville, Pa. 15668.

and should include an outline of the individual's previous amateur slow-scan TV activities and his plans for the use of the tube. QST

Table I

Lens Focal Length	*Approximate Field of View*
15 mm. (wide angle)	½ of lens-to-subject distance
25 mm. (normal)	⅓ of lens-to-subject distance
50 mm. (telephoto)	⅙ of lens-to-subject distance

Strays

While some people are sitting around grumbling about incentive licensing and all the rest of the world's injustices, the Joliet (Ill.) Amateur Radio Society has inaugurated a school for the upgrading of licenses. Each Tuesday night at 8 P.M. at the JARS clubhouse on Public Road, W9MFW will conduct theory classes and W9KPC will hold code classes. FB!

—•••—

CR6JS is named Sousa. Would you say he was active *on* the band or *in* the band?

—•••—

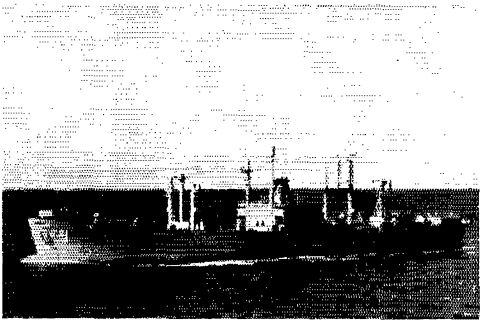
Another ham romance — DJ3YT and DJ8XU were recently married in Radolfzell, Germany.

—•••—

Talk about your weird antennas! ZE3JO says that he has a metal artificial leg which he can hang from the ceiling (when detached from the operator, we trust) and load up nicely on all bands. In fact, he submitted a WAC application based on contacts using this (what would *you* call it?) groundplane.

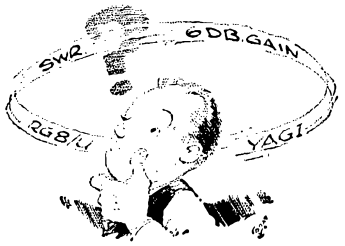
—•••—

W4AX claims that in all his years of hamming, and he's been on the air since 1916, he's never called CQ.



One reason the Navy has permitted amateur radio operation on board its ships is because of the morale factor. The Navy agrees that handling traffic between crew members and their families is great. The USS *Guardian*, pictured above, is a radar picket ship which operates off the east coast, and on board is WA3BIL/MM. W1UEI has been active in establishing a "Guardian Angel" net to handle traffic from the ship, meeting every Sunday morning at 1400Z on 7205 kc. Others in the net include W3JSA, K3QPM, and K2DSO.

Antenna and Transmission Line Quiz



TRUE OR FALSE?

1. V.s.w.r. at the input to a transmission line is normally the same as that at the load.
2. V.s.w.r. on a transmission line is normally different when receiving than when transmitting.
3. V.s.w.r. is the ratio of maximum voltage to minimum voltage on a transmission line.
4. "Reflected power" from an antenna is absorbed in the transmitter final tube and matching circuitry.
5. Feeding a horizontal half-wave dipole directly with coax cable normally results in serious feed-line radiation.
6. Transmission-line loss is independent of the v.s.w.r. on the line.
7. The loss in 100 feet of RG-8/U coax is less than 2 db. in any of the h.f. bands below 30 Mc. if the v.s.w.r. is less than 4:1.
8. A perfectly balanced open-wire transmission line will not radiate.
9. Symmetrical radiation patterns cannot be obtained from a beam antenna unless it is fed through a balun or with a balanced transmission line.
10. There is seldom any justification for reducing the transmission line or antenna v.s.w.r. below 2:1.
11. Coaxial transmission line is preferable to open-wire line for feeding a simple dipole antenna which is to be used on several amateur bands.
12. A transmatch or "antenna tuner" can be used at the transmitter to reduce the v.s.w.r. on the transmission line running to the antenna.
13. The gain of a half-wave dipole antenna can be increased by more than 6 db. by placing it in front of a flat screen reflector.
14. A 5-element 20-meter Yagi on a 48-foot boom can be expected to give more than 3 db. gain over a 3-element Yagi on a 24-foot boom.
15. For all practical purposes a single ground rod is as good as a system of many quarter-wave radials on a quarter-wave vertical monopole antenna.
16. There is no point in using ground radials longer than a quarter wavelength on a quarter-wave vertical monopole antenna.
17. A 40-meter horizontal half-wave dipole 70 feet above average ground has greater gain than a quarter-wave vertical monopole with many quarter-wave ground radials.
18. High antenna efficiency is less important for receiving than for transmitting.
19. The gain of an inductively loaded quarter-wave dipole can be within ½ db. of the gain of a half-wave dipole.
20. The bandwidth of a half-wave dipole is greater than that of a half-wave folded dipole.
21. Ground radials on an h.f. vertical monopole antenna can be buried several inches deep without seriously affecting antenna performance.
22. The gain of a vertically polarized antenna at h.f. is significantly greater if the antenna foreground is sea water rather than ground.
23. The gain of a horizontally polarized antenna at h.f. is significantly greater if the antenna foreground is sea water rather than ground.
24. A horizontal half-wave dipole is nearly 100 per cent efficient if mounted at least a quarter wave above ground.
25. A vertically polarized antenna should be used for best results at h.f. when working DX stations using a vertical antenna.
26. Vertically stacked Yagis may give no improvement in signal-to-noise ratio over a single Yagi when used for receiving.
27. The gain of two vertical monopole antennas side by side can be greater than 3 db. over the gain of a single monopole.
28. The presence of the ground increases the maximum gain of an antenna elevated above ground by up to 3 db. relative to what it would be if the ground were not present.
29. The gain at beam maximum of a horizontal half-wave dipole is independent of the height of the dipole, considering 100 per cent overall radiation efficiency.
30. A half-wave folded dipole gives at least 2 db. gain over a half-wave dipole. QST

Check your understanding of the performance of antennas and transmission lines with this quiz, prepared by Richard C. Fenwick, W5KTR, of the Collins Antenna and High-Power Transmitter Division. Arising from questions asked at radio-club talks, it covers a lot of ground, ranging from things every amateur *should* know to points that will require real thought. Answers next month.

Store-Bought Hardware for the Cubical Quad

BY GLENN FLYNN,* WØMHV

Many antenna builders find themselves thwarted by the lack of boom material and mounting hardware. The author of this article offers a practical solution to this universal problem.

A RECENT *QST* survey indicated that the cubical quad antenna was preferred by many of the world's DX men.[1] The performance characteristics and electrical features of this antenna are outlined in *The Radio Amateur's Handbook*, and in other publications. This article is dedicated to the mechanical aspect of quad construction, which is often left pretty much up to the imagination of the reader. The techniques used by the author, centered around the use of readily-available materials, are applicable to the fabrication of other types of beam antennas as well.

With the frequent appearance of new products on the market, the alert amateur radio operator often discovers hardware items that are useful in home-construction projects. Among these products are a group of metal fittings suitable for use as mounting hardware for the quad antenna discussed in the text. A number of companies have made this material available to the general public.[2]

This material is available in steel or aluminum form, consisting of brackets and fittings of many sizes and shapes. A number of structural configurations for antennas will become apparent as you view the manufacturer's catalog listings and pictures.

The Quad Structure

The boom material for my quad antenna, shown in Figs. 1 and 3, is an 8-foot section of

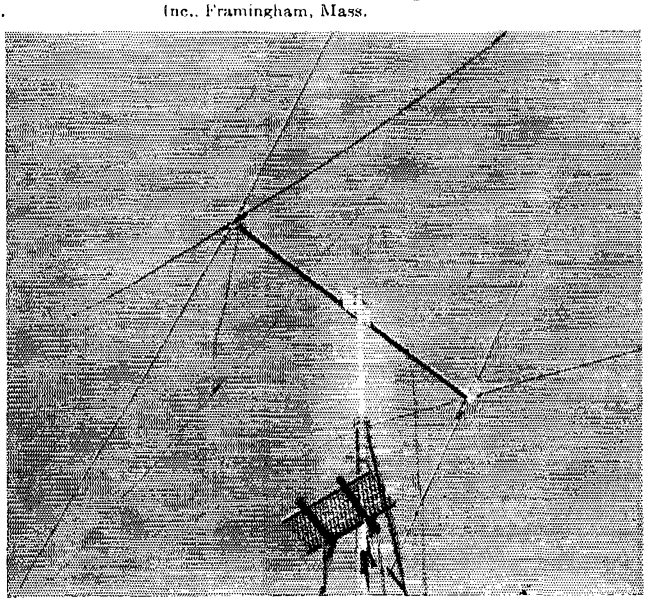


Fig. 1—The 20-meter cubical-quad antenna, whose mounting hardware and boom are made from readily-available material.

* 3335 Summit St., Omaha 12, Nebraska.

[1] Ross, "How DX Kings, Rate Antennas," *QST*, January, 1961.

[2] Multi-Frame, Ainsworth Mfg. Corp., 1471 E. Atwater St., Detroit 7, Michigan; Unistrut Products Co., 1031 W. Washington Blvd., Chicago 7, Illinois; Power Strut, Inc., Framingham, Mass.

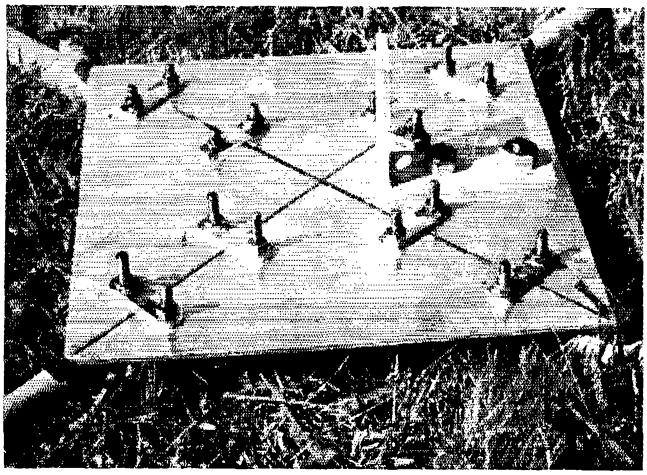


Fig. 2—The support-arm hub plate for the quad antenna. Standard U bolts and brackets are used for mounting the bamboo support arms.

P-1000 Unistrut. The end-plate hubs, for holding the antenna-wire support arms, are fashioned from 12 × 12 × 3/16-inch aluminum plate. Fig. 2 shows the placement of U bolts on these plates, which are used to hold the support arms in place. An angle bracket, used for mounting the hub plate to the boom, can also be seen in the photograph (Unistrut four-hole corner connector). Bamboo poles, cut to 12-foot 6-inch length, are used as support arms for the 20-meter antenna elements. Before mounting them on the hub plates, they should be gone over with sandpaper, then painted with two or three coats of waterproof paint, available from marine-equipment suppliers.[3] After bolting the support arms to the hubs, it is a good idea to coat the U-bolt nuts with automotive Permatex, to prevent them from becoming loose at some future time.

A third 12 × 12 × 3/16-inch plate is used for attaching the boom to the mast (Fig. 3). A pair of U bolts and two Unistrut Z-support fittings are used for this purpose. This completes the mechanical assembly of the antenna.

About the Antenna

Although the purpose of this article was to describe the quad's structure in terms of hardware items, brief mention of the electrical construction and performance may be of interest to the reader.

This particular cubical-quad antenna was cut for the low end of 14 Mc., with each side of the driven element and reflector made from No. 14 wire and cut to a length of 17 feet 6 inches. At the bottom-center of the reflector element, a 7-turn, 1-inch-diameter coil is inserted in place of the more common tuning stub. This coil is wound from No. 14 wire and serves to lower the resonant frequency of the reflector element. The feed line used with this antenna is a length of RG-11/U coaxial cable (72 ohms.)

[3] To prevent damage to the bamboo poles at the point where they are attached to the hub plates, it would be wise to insert short pieces of wooden dowel rod into the bamboo to prevent crushing it when tightening the U bolts. — *Editor.*

Some Final Remarks

The quad antenna was erected in the late months of 1964 and has withstood the strong winter winds of Nebraska, without faltering. Its only use to date has been for weekly contacts with my son, KØMRS, who is attending college in Hanover, New Hampshire. With 90 watts of transmitter power at this end of the circuit, we have never failed during a schedule, even though the signals were several layers deep on many occasions. The forward gain of the antenna seems to be good, although the front-to-back ratio could be improved by adjustment of the reflector coil, which time has not permitted.

In summary, I hope this article will point the way to easy and economical home-construction techniques for the antenna enthusiast. Each state has a franchised Unistrut dealership. The current price for the P-1000 stock is $55.60 per 100 feet. It is available in 20-foot lengths. QST

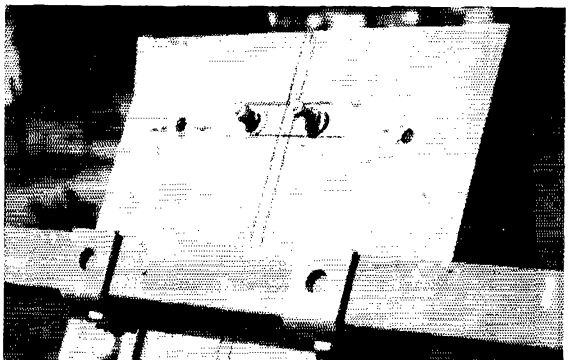


Fig. 3—The mounting plate which is used to fasten the boom to the mast, showing standard fittings described in the text.

A Low-Noise Double-Conversion 144-Mc. Converter

A Practical Approach to Image Rejection for 2-Meter Reception

BY GERALD R. LAPPIN,* W4WQZ

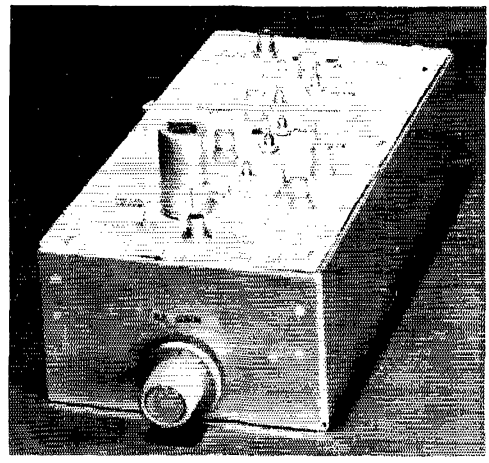


Fig. 1—This low-noise 2-meter converter permits the use of a single crystal frequency to generate the injection signals required by both mixers. Through the double-conversion process, a low i.f. output is practical.

THE use of double conversion in a 144-Mc. converter, to provide good image rejection while still retaining the advantages of a low output frequency, has been discussed by W1EYM.[1] W2ZKF[2] suggested an alternate circuit, using a lower first-mixer output frequency, to improve image rejection still more. Keene also pointed out the improvement in noise figure to be expected from image-noise rejection in such a circuit.

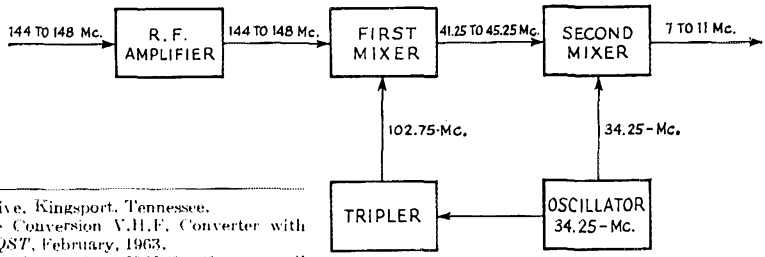
Being blessed with a very good v.h.f. location, a high ridge in the foothills of the Smokies, I am also cursed with a wide variety of strong spurious-response-producing signals from TV, f.m. and aircraft. Attempts to use a conventional converter[3] with a 7- to 11-Mc. output resulted in most of the 2-meter band being obliterated by squeals, squawks, howls and buzzes. Changing to 14- to 18-Mc. output only slightly improved the situation. The advantages previously claimed for the double-conversion principle suggested that experimentation with such circuits might prove fruitful. The converter herein described is the final outcome of this investigation and has resulted in considerable improvement over the one previously used.

Circuit Description

Fig. 2 shows the basic circuit as presented by W2ZKF. The 144-Mc. signal, after amplification, is combined in the first mixer with the third harmonic of the 34.25-Mc. crystal. The resulting 41.25-Mc. signal is fed into the second mixer, with the oscillator fundamental, to give the final 7-Mc. output. In reducing this concept to the functioning circuit shown in Fig. 3, a number of alternatives were investigated with the interesting results noted below.

In the first version, a cascode front end was used but, as usual, it proved hard to neutralize and was sensitive to changes in the impedance seen by the input circuit. This occurred when the antenna relay was switched. Another version used two paralleled 6CW4s in a grounded-grid stage[4] (this accounts for the empty socket in the photographs). The extra 6-db. gain was not worth the troubles caused by the increase in input and output capacitance. The final version uses two grounded-grid 6CW4 stages for 144-Mc. amplification. This configuration provides about the same noise figure as the cascode, with adequate gain to override the noise of the first mixer. It is rock stable if reasonable shielding between

[4] Wonsowicz, "144-Mc. Nuvistor Converter," *73*, October, 1963.



2—Block diagram showing the double-conversion method used with a single crystal.

* 4047 Skyland Drive, Kingsport, Tennessee.

[1] Bishop, "Double Conversion V.H.F. Converter with a Single Oscillator," *QST*, February, 1963.

[2] Keene, "Double Conversion V.H.F. Converters," (Tech. Corr.), *QST*, April, 1963.

[3] *The Radio Amateur's Handbook*, 40th ed., 1963, p. 409.

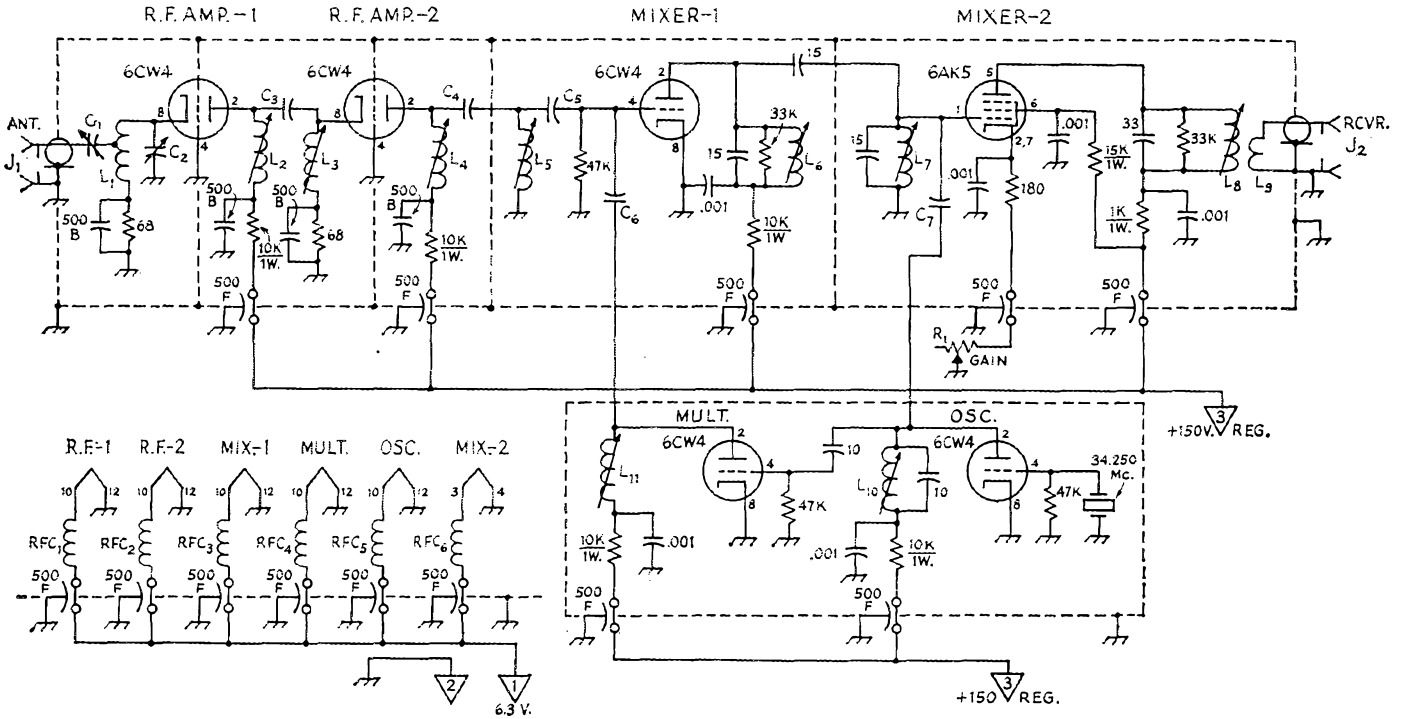


Fig. 3—Circuit of the crystal-controlled converter showing shield partitions in dotted lines. Fixed capacitors of decimal value are disk ceramic. Others are NP0 ceramic, except as noted. F indicates feedthrough and B signifies button-mica. Unless indicated otherwise, resistors are ½-watt composition. Except as indicated, decimal values of capacitance are in microfarads (μf.); others are in picofarads (pf. or μμf.); resistances are in ohms; K = 1000.

C_1—8- to 50-pf. ceramic trimmer (Centralab 822-AN).
C_2—2.5- to 13-pf. ceramic trimmer (Centralab 822-BZ).
C_3, C_4, C_5, C_6, C_7—"Gimmick" capacitor of insulated hookup wire twisted tightly 3 turns.
J_1, J_2—Phono jack or coaxial connector.
L_1—4 turns No. 18 wire, ¼-inch diam., ¾-inch long, tapped ¾ turn from top.
L_2, L_4—4 turns No. 28 enam., close-wound.
L_3, L_5—3½ turns No. 28 enam., spaced wire diam.
L_6—5 turns No. 28 enam., close-wound.
L_7—6 turns No. 28 enam. close-wound.
L_8—40 turns No. 32 enam., scramble-wound.
L_9—5 turns No. 28 enam. on cold end of L_8.
L_{10}—14 turns No. 28 enam., close-wound.
L_{11}—9 turns No. 28 enam., close-wound.
Coils L_2 through L_{11} are wound on ¼-inch diam. iron-slug, ceramic forms.
R_1—20,000-ohm control, audio taper.
RFC_1—RFC_6, INC.—15 turns No. 28 enam. on 100,000, ohm ½-watt carbon resistors.

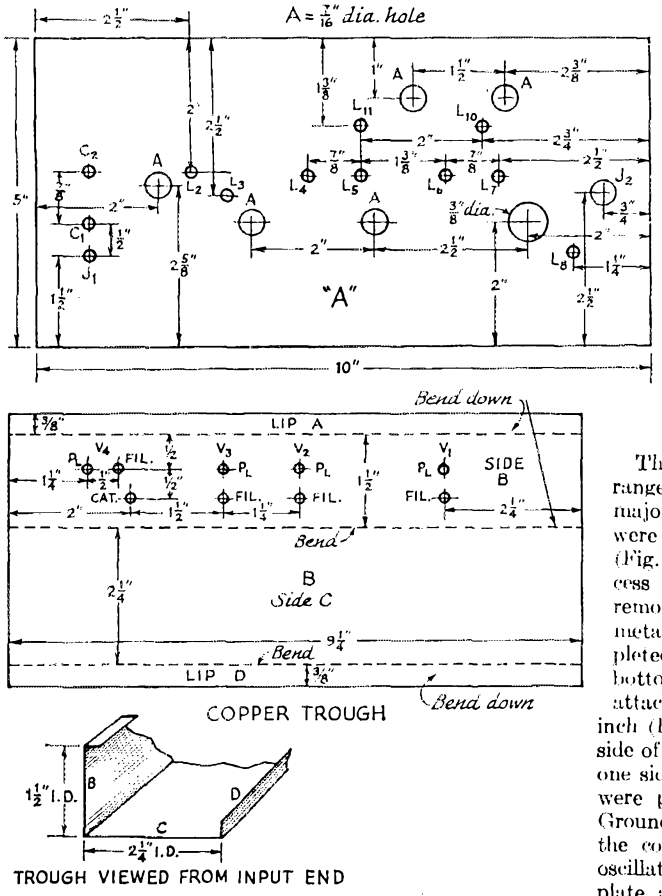


Fig. 4—Details for chassis plate and trough compartment. Hole diameters for coil forms and feedthrough capacitors are dependent upon types used.

input and output is provided. It is unresponsive to changes of input impedance. The signal from the antenna is fed through a variable capacitor, C_1, to a tap on the input coil, L_1. The setting of C_1, and the position of the tap, have a small effect on the noise figure. Performance deteriorates just slightly if the signal is fed into the top of L_1 through a fixed capacitor. The input circuit uses an air-wound, capacity-tuned coil to facilitate changes in the tap position. All other tuned circuits use slug-tuned coils. If tapped-down input is not desired, L_1 could be identical to L_3. Both mixer plate coils are shunted with 33K resistors to give broader tuning and to discourage any tendency toward oscillation. Interstage coupling in the 144-Mc. stages is accomplished by using small gimmick capacitors, with their leads passing through small holes in the interstage shields. The oscillator chain employs two 6CW4s, one as the oscillator and one as the tripler. The first mixer is a 6CW4 in a conventional triode-mixer circuit. Injection to the mixer grid is through a small gimmick, C_6, passing through the shield. The second mixer is a 6AK5 which provides somewhat more gain than a triode mixer. (My junk box provides more 6AK5s than 6CW4s.) It could as well be a duplicate of the first mixer. This stage has a gain control in the cathode return. Injection is provided as in the first mixer. In one version, an amplifier stage at 41.25 Mc. was used between the two mixers. This stage tended to oscillate, and provided more gain than was needed. No advantage from the increased isolation between mixers could be observed. All operating voltages are supplied from a separate power supply with the B+ regulated at 150 volts.

Construction

The photograph Fig. 1, shows the general arrangement and Fig. 5 shows the location of the major components. The r.f. and mixer stages were mounted in a $9\frac{1}{4} \times 2\frac{1}{4} \times 1\frac{1}{2}$-inch trough (Fig. 4) formed from flashing copper. For access during construction, one side was made removable and fastened in place with sheet-metal screws. Shielding of these stages was completed, after wiring and checking, by adding a bottom cover and end pieces. This trough was attached by bolting at the corners to a 5 × 10-inch (Fig. 5) aluminum top plate with the open side of the trough parallel to, and 2 inches from, one side of the plate. All of the mounting holes were punched or drilled through both layers. Ground connections were made by soldering to the copper shield, using a 250-watt iron. The oscillator-tripler unit was assembled on the top plate along the open side of the trough. The oscillator plate coil is adjacent to the second mixer grid coil. The tripler plate coil is next to the first mixer grid coil. The removable side of the trough separates the mixer coils from the oscillator-tripler coils. The injection gimmicks pass through small holes in this shield. The oscillator-tripler unit, including the crystal, is completely enclosed in a separate shield formed from sheet aluminum.

The Nuvistor sockets for the grounded-grid stages were mounted so that a line through Pin

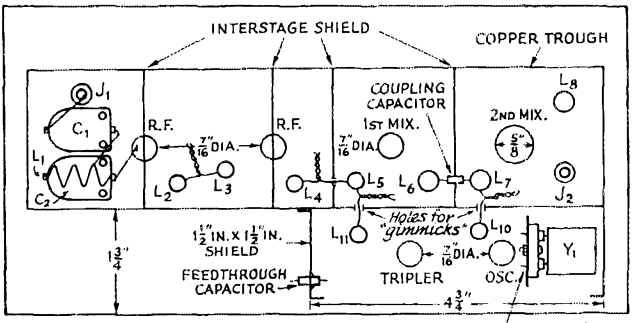


Fig. 5—Pictorial layout of underside of chassis, showing shield partitions and gimmick coupling wires.

4 (grid) and Pin 12 (filament) was perpendicular to the long axis of the trough. Flashing-copper shields, 2¼ by 1½ inches (Fig. 6), were cut to fit closely over the sockets in contact with Pins 4 and 12. These shields were soldered to the grid and filament pins, and to the copper trough. Small tabs were left on the other two sides so that the removable side and bottom plates could be fastened to these shields with sheet-metal screws. Similar shields separate the second r.f. stage from the first mixer, and the first mixer from the second one. These were soldered in place between the respective plate and grid coils. Small holes allow the passage of the coupling capacitors.

All leads not carrying r.f. leave the individual shielded compartments through 500-pf. feed-through capacitors mounted through the fixed side of the trough. Filament connections were made through small r.f. chokes. The plate connections were routed through dropping resistors to improve the decoupling of the various stages. Bypass capacitors in the 144-Mc. sections are all of the v.h.f. button type. Leads, especially in the 144-Mc. stages, were kept to a bare minimum length. Much of the freedom from spurious responses results from the thorough bypassing and isolation between stages.

The coil data given should be considered as a guide only. Variations in lead length, component placement and other uncontrolled variables, make it almost impossible to wind coils for 144 Mc. without recourse to actual measurement in the circuit with a grid-dip meter.

It is strongly recommended that the oscillator be wired first, followed by the second mixer, then the tripler and first mixer, and on back through the circuit. If this is done, the oscillator may be peaked for optimum output. Then, with the converter connected to the receiver, the second mixer can be peaked on a 42-Mc. signal from a signal generator or grid-dip meter. The tripler can then be tuned for maximum 102.75-Mc. output, using a grid-dip meter, in the diode position. A signal at about 145 Mc. can then be fed into the first mixer, and all circuits tuned for peak response. In the same fashion, the r.f. stages can be checked individually. In this way, any malfunctions can be detected and eliminated easily. Upon completion of the wiring, the converter will be ready to use for signals other than the weakest ones.

After wiring and testing the converter, the bottom end plates were fastened in place and the entire unit was mounted in an inverted 5 × 10 × 3-inch chassis, as a protective cover.

Final Alignment

If the order of construction suggested above is followed, alignment consists largely of touching up the front-end tuning to give the best noise figure. This was done in the usual manner, using a diode noise generator. Alignment, using a weak

(*Continued on page 100*)

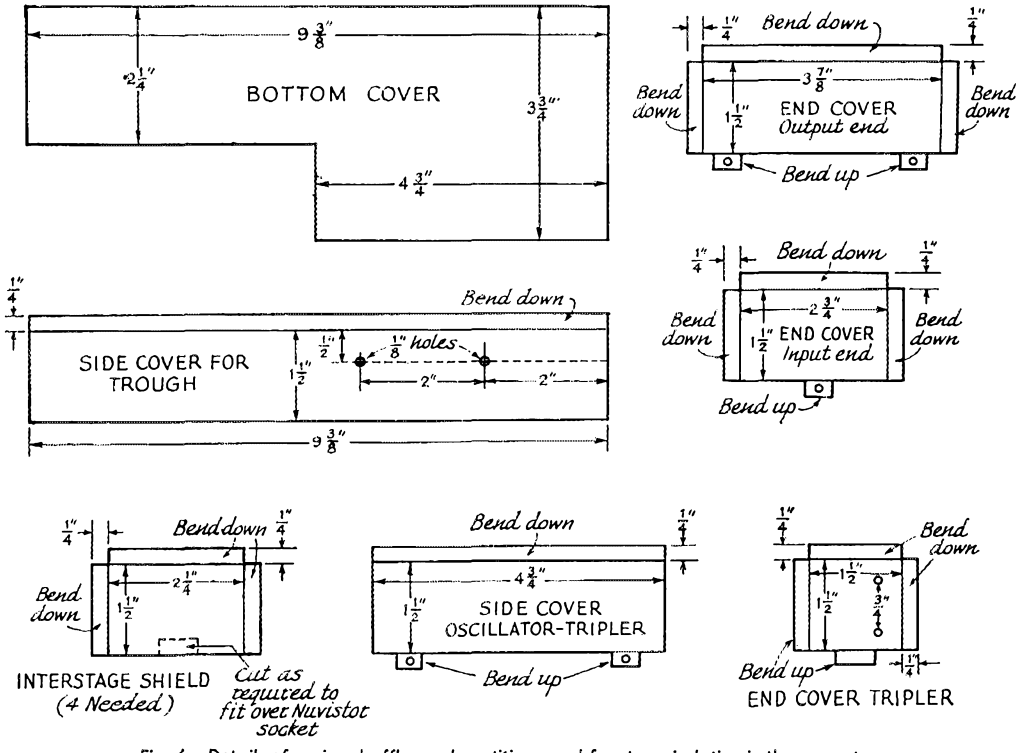


Fig. 6—Details of various baffles and partitions used for stage isolation in the converter, made from brass or flashing copper.

The Anatomy of Public Service Communications

Part 2: The Ins and Outs of John Hamm's Progress.

BY GEORGE HART*, W1NJM

John Hamm is an ideal ARPSC leader, but he doesn't get away without any troubles. In this installment we talk about some of them and show how his local AREC organization is tied into the National Traffic System.

LAST month we left our hero, John Hamm, WA0XHH, all set up in his little town of Southport, ready for any emergency. The Red Cross and civil defense have been integrated into the picture, an amateur radio control center has been established at Red Cross headquarters and a RACES control center at c.d. headquarters. The amateurs in town, infected with John's enthusiasm and vigor, are available to staff these control centers as well as operate their home stations, mobiles and portable stations which can be moved about quickly. John has even set up a technical building program to keep those amateurs busy who are inclined this way. Nets have been established for local coverage, mostly on v.h.f. although a fairly large contingent of 75-meter phone operators is available. From a low ebb of practically nothing, interest and enthusiasm are running high in Southport.

Local Troubles

But we wouldn't be realistic, or even truly illustrative, if we just cheerfully took it for granted that everything went along smoothly from this grand beginning. It never happens that way. In Southport, for example, John Hamm soon discovered that many amateurs who gave lip service to the project were not around when there was work to be done. When contacted, they were inclined to say they did not "have time" to take part in drills or tests, but that they'd be there when an emergency came along.

John did the wise thing — he wrote them off. This, however, reduced his cadre of operators so much that he was forced to give up the idea of an extensive amateur radio control center, and the Red Cross station became just a Red Cross station, while various amateurs around town were assigned liaison duties which the control center had been intended to perform. There weren't enough operators at the RACES control center, either, and the RO was busily trying to train non-amateurs to take up the slack.

In most towns such as Southport, it usually turns out that one man does most of the leading. The RO soon decided he could not handle the job and resigned, so whom do you suppose was asked to take over? Right, John Hamm! Since no one else wanted it, he had to accept or allow RACES to wither on the vine, so the appointment was duly made by the c.d. director 'midst much fanfare.

Far from allowing his two duties to conflict and subject himself to divided loyalties, John made it clear to everybody from the outset that he considered neither job paramount. Equipment and facilities supplied by the Red Cross, by civil defense, by the amateurs themselves, and by everyone else was *pooled*. Oh, the owning agencies kept their identification on it, all right, and occasionally John ran into difficulties with officials concerning who was to use the equipment and for what purpose, but in general his opinions and decisions prevailed because he made his point very strongly that this was an amateur radio facility and it was going to be run *by* amateurs to do the best possible job for all concerned. The amateurs used the gear regularly in tests and drills and were responsible for maintaining it in operating condition at all times.

Although he took his cues from those to be served, John was the "boss" of amateur communicating in Southport, and because he carried it off with an air of dedication and responsibility he became respected by and depended upon by the majority. He didn't just talk, he *performed*.

Snipers? Oh yes, every town has these. As an example, one of the things John did was divorce the public service group from the club and invite all amateurs in town to participate. Some of the club members didn't much care for this, particularly when he designated some assistants from non-members, and a move was started to throw him out of the club. Naturally, it got no-

* National Emergency Coordinator, ARRL

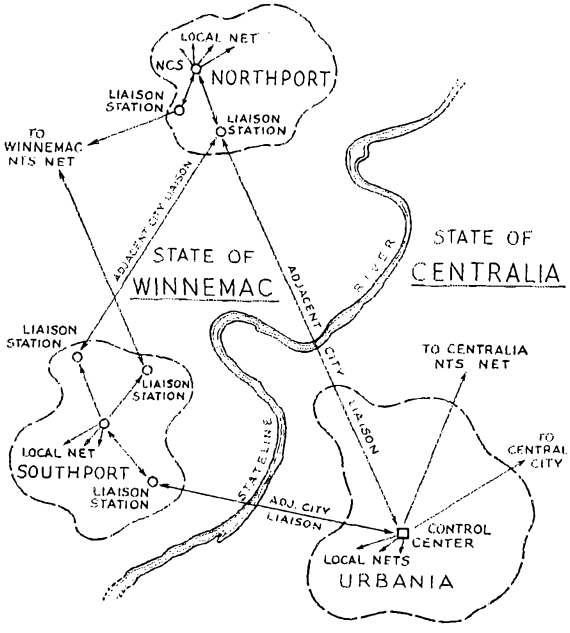
where, because wiser heads prevailed, as they usually do. Two or three amateurs in town started spreading the word that John was "taking over" the whole town and running it to please himself, and insinuated that there was graft in the picture somewhere.

A small minority of officials of served agencies, probably victims of TVI, took an anti-amateur attitude, saying that amateurs were irresponsible and that all emergency communications could be handled by CBers under the supervision of some responsible government official (them, no doubt). But John successfully defended himself against all such attacks and continued to receive majority support.

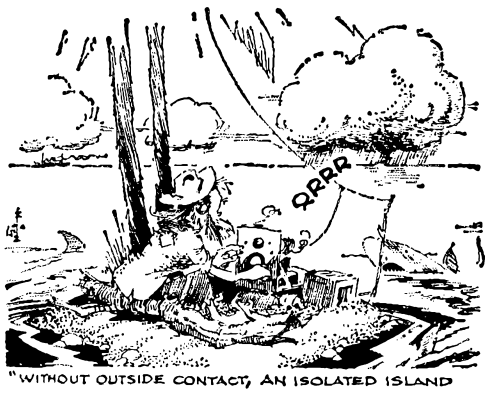
Outside Contact

Along with the developing situation inside Southport was the realization that this was just one small town which, no matter how well organized internally, would be an isolated island without contact with the "outside." Let's assume that John's community of Southport is a small town near the Stateline River in the state of Winnemac (see map). A few miles to the north is Northport. Across the river in the state of Centralia is the large city of Urbania.

We'll develop this fictitious geography in more detail later. What we'd like you to notice here are the connecting lines of amateur radio communication (via ARPSC) between and among these three towns, and the liaison with the Winnemac Section Net. John very early contacted ECs of the adjacent towns and set up these contacts, because in an emergency situation the need for direct contact with an adjacent town is probable. Even across the river into another



The setup in Urbania, Southport and Northport.



"WITHOUT OUTSIDE CONTACT, AN ISOLATED ISLAND OF COMMUNICATION"

state such contact will be needed — because after all, emergencies are no respectors of state boundaries, and besides the Stateline had a bad habit of going on a rampage once in a while and flooding the dickens out of the whole area.

Contact with other cities and towns in the state is maintained via WSN, the Winnemac Section Net, and through it with the entire National Traffic System, by means of which an emergency message can reach any part of the U. S. or Canada in rapid time. The state is not an especially populous one, but there are a few "key cities," such as Eastport and the capital city of Centerport, each of which has its own ARPSC setup and nets for distribution of traffic. Each of these towns also has its own representatives in the section net, and there are single-station representatives from many of the smaller towns and rural areas. The net operates every night at 1900 CST for about 45 minutes, in "directed" session.

In an emergency, of course, it would operate continuously when and as long as needed. Certain key stations of John's AREC group are designated as liaisons to WSN and take turns representing Southport. The Southport v.h.f. nets are therefore Local Nets of the National Traffic System.

The Big Picture

What occurs in Southport and Winnemac occurs in most towns and nearly every section of the ARRL Field Organization (74 in all) in every state of the U. S. and all Canadian provinces. A somewhat extensive system of nets exists above the section level to tie everything together and provide for systematic flow of traffic.

Winnemac, being a north-midwestern state, is in the NTS Tenth Region, which covers most of the 9 call area and part of midwestern Canada. The Tenth Region Net, like all other midwestern Region Nets, first meets of 0145 GMT and contains representatives from each of the Sections in the Region, of which Winnemac is one.

Then at 0230 GMT the Central Area Net meets, containing representatives from each of the Region Nets in that Area. At the Area Net level, traffic headed for points in other Areas is

given to functionaries of the Transcontinental Corps (TCC), other functionaries of which are bringing traffic into the same Area Net from other Areas.

The traffic flows both ways at the same time. For example, in the Region Net the representatives from the Winnemac and Centralia Sections might be dispatched to a side frequency to clear their traffic. One may have traffic for the other or they may both have traffic. Sometimes the Winnemac station may be "receive only," in which case the net will contain another Winnemac station for "transmit only," a fine arrangement if enough qualified stations are available to handle it.

The same sort of thing occurs at the Area Net level, and of course TCC stations are specialized, one to a function, whether this be receiving traffic in an Area Net and later sending it to a distant counterpart in another Area, or receiving traffic from a distant counterpart and distributing it in NTS nets in his own Area.

The NTS nets have to meet sequentially if they are to accomplish the maximum in getting traffic speedily from origin to destination. Since the normal operation of the system is set up for the evening hours, when most amateurs are available, the normal sequence starts with Local Nets on the east coast and progresses through Section, Region and Area Nets at intervals, then goes back through Region and Section Nets the same evening. In the middle west the sequence starts an hour later, on the west coast three hours later.

Section Nets wind up their last sessions fairly late in the evening, usually about 10:30 P.M. local time, depending on what brand of local time is currently being used. Thus, when things wind up on the east coast they are just getting started on the west coast, so while it is practical to deliver east-coast-originated traffic on the west coast the same night, the reverse isn't true in the normal procedure. To help compensate for this delay occasioned by a fact of nature, TCC stations in the Eastern and Central Areas receiving traffic from the Pacific Area are authorized to do what is strictly "taboo" otherwise (except in emergency) — "short circuit" the system by reporting directly into destination nets if possible.

One cycle per day is normal. In an emergency, depending on the extent and intensity of same, NTS nets may conduct two cycles, a dozen, or run continuously upon the instructions of the net managers and at the behest of AREC officials in the areas affected. Thus it can be seen that the Amateur Radio Public Service Corps (ARPSC) consists of the Amateur Radio Emergency Corps, which is an emergency organization with a normal-time function, and the National Traffic System, which is a normal-time organization with an emergency function.

John Hamm Takes a Trip

We suppose all this sounds very complicated, but it's essentially quite simple. On our NTS article a year ago[1], we compared the progress of a message through the system with a traveler on the commercial air lines. Just as NTS is a system for getting masses of messages from origin to destination, the air lines constitute a very similar system for getting masses of travelers from point to point. Let's assume John Hamm is taking a trip to San Goo, Calif., a small town in San Bernardino County, and compare his progress with that of a message originated by him going to a friend of his in the same town. We will see that each move is similar.

John's first step is to call a taxi to take him to the Southport Hotel, where the airport limousine picks up airlines passengers. In the case of the message, WA0XIHH takes it to Section Net, where a "through" station collects all messages going outside the section.

At the hotel, John boards the limousine and is transported, along with a lot of other passengers, to the Southport air terminal, where still more passengers are gathering to board the flight to St. Loo, the nearest large-city terminal. In like manner, the message is taken, along with a lot of other messages, by the liaison station (limousine) to the Region Net, where many other messages are being collected for the Area Net.

At the air terminal, John boards a flight to St. Loo airport, at which place he joins many other travelers on their way to California by transcontinental jetliner. The message is taken to the Area Net where it is placed in the hands of a TCC functionary (jetliner), along with other messages, to make the long hop to the west coast.

The jetliner takes off in a cloud of oil smoke and water vapor and in seemingly no time at all lands at the Los Angeles airport, where the travelers disembark and hurry to their respective destinations or connecting flights. The message is shot to a west coast TCC functionary and taken to the Pacific Area Net (Los Angeles airport) where messages are distributed to the representatives from the various Region Nets.

John has to board a feeder airline to take him to the San Goo airport, along with a few other passengers going to the same area. The message is taken to the Sixth Region Net and given to the representative from the section in which San Goo is located.

John's travels are not yet over. The San Goo airport is quite a way out of town, so his next step is the limousine into town. The message is taken by the section net representative to the section net and given to a station in San Goo.

A taxi then delivers John to his destination. The San Goo station receiving the message delivers it by telephone or by further relay on a Local Net.

There are a few differences between air travel and NTS, one of which is that NTS schedules are arranged specifically for the purpose of making connections, whereas in our experience most

[1] June '64 *QST*, page 43.

airline schedules are diabolically arranged to make connections impossible. Otherwise, the analogy is a fairly close one. For example, suppose John was not going to San Goo, but his destination was Los Angeles. In that case, he would simply "get off" and that point and "be delivered," just as any operator at any level of NTS might deliver a message that happened to be for his own town. The airport limousine might drop John at the front door of his destination if it happened to pass that way, depending on the humor of the driver, just as an operator along the NTS route might deliver a message without its going through the entire chain, if this happened to be convenient.

Many people say that NTS is roundabout and contains many unnecessary relays. So is and does air travel. It would be more convenient and easier and undoubtedly faster for John to charter a plane to fly him direct from Southport to San Goo — *if* he could get one (also *if* he could afford it). In an emergency, it might well be worth while. But in normal travel, it makes sense to follow established routes. The same applies to normal message handling. Nearly any operator along the line can take any particular message out of the normal routes and perhaps get it to its destination quicker than if it followed regular NTS routing. This can apply to one message, or two messages, or a group of them if they all happen to be going to the same place; but how about *all* messages?

The way some messages are routed reminds us of the air travel we used to do in the service. You'd go to the air base and hang around and sooner or later you'd be able to hitch a ride with some pilot headed in the direction you wanted. Maybe you'd be lucky and this would put you near your ultimate destination and you'd be home quicker (not to mention cheaper) than if you'd taken a commercial air line. Also, maybe you wouldn't. Maybe you'd have to cool your heels at operations for hours, or maybe you'd get a ride not quite where you were headed but you'd gamble that you could pick up another ride at this point. The whole thing was a gamble, as hitch hiking always is. You might be lucky and get home in jig time; or you might lose the gamble and spend a miserable couple of days at it. You never knew. If you wanted to be sure, you'd travel scheduled routes.

Of course even regular scheduled routes can be fouled up at times. In the air lines it's the weather, or mechanical failure, or a pilot strike. In NTS it can be bad conditions, operator failure (to

show up as assigned), or just plain forgetfulness or carelessness, or even a rig breakdown. You might say that NTS is even more subject to breakdown than are the air lines, because after all the latter is a paid service. But by and large, NTS is the "scheduled air line" of amateur radio. It's geared to regular, systematic traffic flow. It might not be as fast as an independent route for this or that particular message, but if properly supported it is a whale of a lot more dependable than catch-as-catch-can routings.

John Becomes Prominent

But let's get back to John Hamm, whom we left contacting ECs in adjacent towns and setting up NTS liaison so his AREC group would have outside connections when needed. An amateur such as John is not likely long to be unnoticed by section officials. As a versatile amateur, at home with all modes, John does somewhat more than his share of liaison work to the Section Net — so often and so well, in fact, that he is appointed RM and takes over all c.w. net organization in the section. This makes him active at an even higher level, and first thing he knows he is the Section Net's principal liaison to the Region Net, and Region Nets are no place for beginners.

But John is no beginner. He becomes prominent, by active participation, in Region and Area Nets and in the Transcontinental Corps, serves as manager at a couple of these higher echelons and winds up as Central Area director of the TCC.

So there he is, saddled with three big jobs, two local and one at the national level. Can he handle them all? Will success go to his head? Will he break down under the strain? Tune in next month, same magazine, same title, and follow his further adventures into nationwide traffic handling and an actual emergency. QST

Strays

The Concord (New Hampshire) Bicentennial Committee and the Concord Brasspounders Amateur Radio Club, W1OC, have announced their joint sponsorship of the New Hampshire-Concord Bicentennial Award. The certificate will be awarded, free of charge, to any ham who makes ten contacts with New Hampshire stations during the year 1965. Of these ten contacts, at least three must be with Concord stations. No endorsements except at time of application. Submit a list of confirmed contacts to W1OC, Concord Brasspounders Radio Club, P.O. Box 339, Concord, New Hampshire.

A *Different* Type of V.F.O. Circuit

Push-Pull Colpitts With Push-Push Output

BY JAMES F. GORDON,* W6UCP

THE practice of using the eighteenth harmonic of 8,000- to 8,222-Mc. crystals to cover the 144- to 148-Mc. band is sufficiently widespread to establish the general utility of variable-frequency oscillators which may be directly substituted for the crystal. Many arrangements have been previously described in *QST* as well as in other publications to do this job. The circuit described here, aside from providing excellent performance, has some features that should prove useful in other applications.

The Basic Circuit

A block diagram of the exciter unit is shown in Fig. 1. It consists of a push-pull Colpitts oscillator having push-push second-harmonic output feeding a single amplifier stage. Included in the circuit is a crystal bridge for comparing the exciter output frequency directly with any crystal in the 8,000- to 8,222-Mc. range.

The oscillator uses two type 6AS6 tubes in which the first and second grids function as triode oscillator grids and plates, respectively. The third grid is grounded and functions, in each tube, to isolate the parallel-connected plates from the oscillator circuit. This technique is widely used in single oscillator tube circuits and the advantages are well known. The push-push output connection allows direct second-harmonic output to be generated, without recourse to a resonant circuit. This is advantageous since it is virtually impossible to eliminate completely the pulling effect of a resonant circuit in the plate of an electron-coupled oscillator, even at the third harmonic. As would be expected, the second-harmonic output is low. For the circuit shown in Fig. 2, it is between 1 and 2 volts r.m.s. This requires an amplifier such as the 6BA6 to raise the signal to a useful level.

* Box 1377, Santa Ana, Calif. 92702.

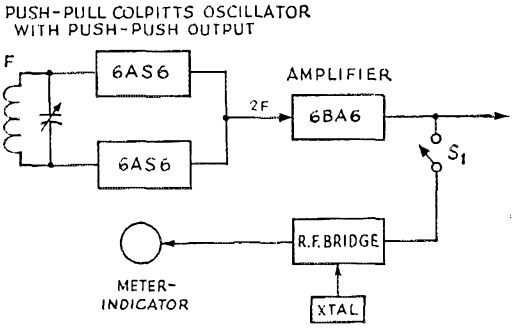


Fig. 1—Block diagram of the variable-frequency oscillator assembly and frequency spotter.

Choice of Oscillator Tubes

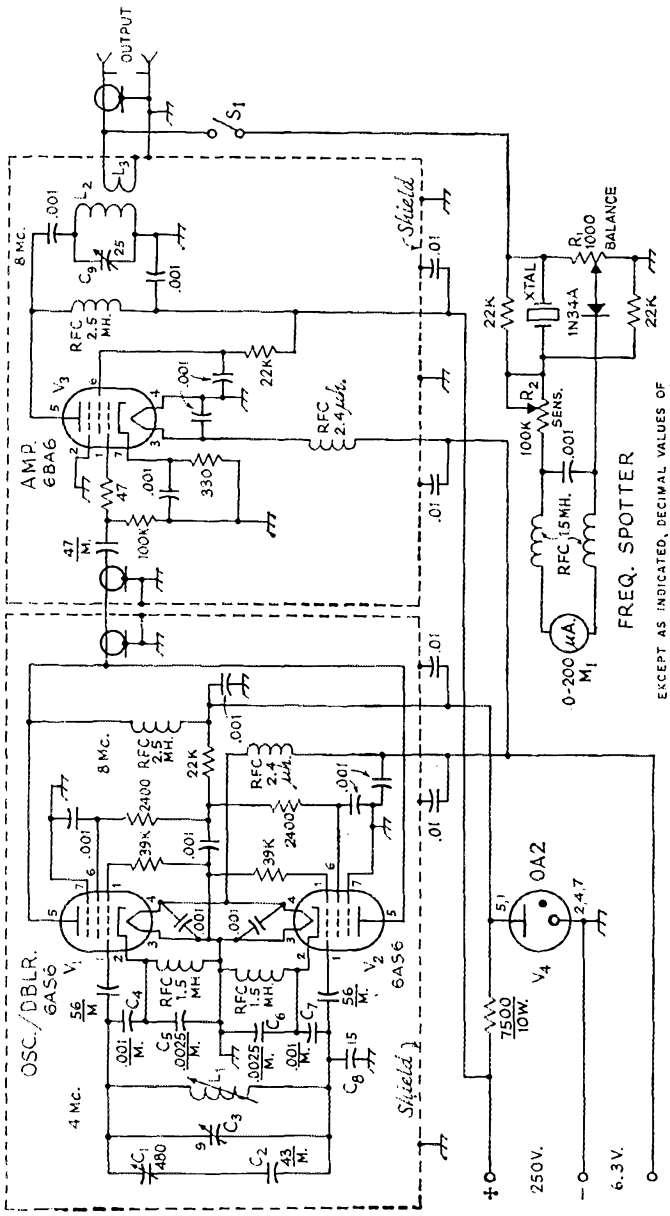
Any of several tube types will function in a push-pull Colpitts oscillator of the type shown. The 6AS6 was chosen because of its small internal element dimensions, relative freedom from microphonics, reasonably high transconductance when used in the triode connection shown, and the useful plate-circuit isolation afforded by the No. 3 grid. The use of vacuum tubes with physically large elements increases the hazards of frequency instability from relative mechanical movement of the elements. Such changes are largely capacitive and are created by shock, vibration, and movement caused by thermal changes. JAN-type tubes are more uniform than commercial types. If a choice is possible, the military version should be used. After assembly the circuit should be carefully tested for such possible unstable symptoms before final calibration and use.

Harmonic Output

Good practice has always dictated that the output of a v.f.o. be taken at twice the oscillator frequency at least. This usually results in a high percentage of the fundamental being present in the multiplied output. This is especially true if the circuit must remain simple. The use of the push-push output tends to cancel the fundamental. If the vacuum tube and circuit components are well balanced the output will be fairly pure second harmonic.

In the circuit of Fig. 2 the output is predominantly second harmonic and the percentage of the fundamental appearing in the 6BA6 amplifier output is negligible.

Although the v.f.o. described here was constructed specifically for replacing 8-Mc. crystals for 144-Mc. operation, the applications of the circuit are not confined to v.h.f.; the same basic arrangement can be used for other frequencies with suitable modification of values. The method of frequency compensation for line-voltage changes is not well known, and the frequency spotter is a handy device.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf.); RESISTANCES ARE IN OHMS; K = 1000.

Fig. 2—Circuit diagram of the v.f.o. and frequency spotter. Fixed capacitors are disk ceramic, except M indicates mica. Fixed resistors are ½-watt composition except as indicated.

C_1—See text; capacitor used is 14-481 pf., ceramic insulation (Radio Condenser Co. series 23, type M).
C_2, C_4, C_5, C_6, C_7—For text reference.
C_3—9-pf. midget trimmer (E. F. Johnson type 160-104).
C_8—NPO ceramic.
C_9—App. 25 pf. max., midget variable.
L_1—13 turns No. 24 enam. spaced approximately wire diam. on ¾-inch diameter slug-tuned ceramic form (National XR-72).
L_2—36 turns No. 20 enam. close-wound on 1-inch diam. form.
L_3—5 turns No. 20 enam. close-wound on same form as L_2, spaced ¼ inch from ground end of L_2.
M_1—0-200 microammeter (higher sensitivity also satisfactory).
R_1—1000-ohm control, linear taper.
R_2—0.1-megohm control, linear taper.
S_1—S.p.s.t. wafer or slide switch.

The Prototype Assembly

The prototype oscillator assembly is shown in Fig. 3. The components are mounted on a single aluminum plate. The active oscillator parts of the circuit are mounted on one side of the plate while the output circuit from the push-push plates is located on the opposite side. The chassis plate functions as an effective electrostatic shield as well as a heat sink to reduce frequency changes caused by abrupt changes in ambient temperature. The parts list shows a specific type of tuning capacitor C_1, and the chassis plate is dimensioned for that type. It is normally difficult to obtain a straight-line-frequency capacitor with precision bearings having both the proper capacitance and mechanical rigidity for this type of oscillator. A good compromise is to use one of the more readily available larger capacitors, such as is shown here, and reduce the tuning range by series fixed capacitance, C_2. If the builder is fortunate he may find one of these capacitors on the surplus market: this particular model has been available from time to time. It is not essential that this capacitor be used, and the builder may elect to take advantage of the most convenient thing available. After all, this is in the tradition of the radio amateur's heritage of innovation.

Frequency Instability

The frequency instability of almost all v.f.o. circuits may be attributed in varying degrees to

the following:

1 — Thermal instability of the components.
2 — Variations in vacuum-tube heater supply voltages.
3 — Variations in vacuum-tube plate supply voltages.
4 — Variations in the relative positions of components due to shock, vibration, and thermal changes.
5 — Variations in oscillator loading.
6 — Undesired feedback from output circuit to oscillator.
7 — Oscillator modulation through unwanted electrical and/or mechanical coupling or excitation.

The obvious way to attain thermal stability is to provide temperature compensation. Most amateurs do not possess the facilities for readily determining the thermal correction requirements for such circuitry, so it is rarely resorted to. However, for those who would like an introduction to such procedures an excellent discussion[1] was published in the December 1963 issue of *QST*. Another compromise is to attempt the use of zero-temperature-coefficient components throughout. The variety of the components required makes this unattractive though some improvement can usually be accomplished. Another approach is to place the sensitive circuit in an oven which is precisely controlled. Again this gets a little out of hand for the average experimenter. Commercially, the problem is solved by using low drift components, applying temperature compensation, and finally placing the circuit in an oven. This would seem to be gilding the lily for most amateurs.

All is not lost, however. It is still possible to obtain pretty good performance by using standard components without recourse to such complicated procedures. Since it is necessary to place the oscillator circuit in a metallic enclosure, this will at the same time reduce the tendency for ambient air circulation around the components. This tends to improve short-term stability. Anything that can be done to reduce the volume of air circulating around the components is usually helpful. This implies the use of small-volume housings. This further improves the effectiveness of the metal chassis plate as a heat sink, and the use of slim mounting posts at the four corners (see Fig. 3) tends to isolate the chassis thermally from the housing. Since the oscillator frequency must be multiplied by 36 times it can be readily appreciated that any instability will be multiplied in frequency by 36 over the equivalent values observed, say, in the 3.5- to 4-Mc. band. Once the oscillator has reached thermal stability (the condition where the components are losing exactly the same amount of heat that is being delivered to them) the frequency will remain relatively constant. Of course there will be an eventual change whenever the room ambient changes sufficiently to react on this thermal balance.

The thermal inertia of the aluminum chassis

[1] Decker, "Tuned Circuit Temperature Compensation," *QST*, December, 1963.

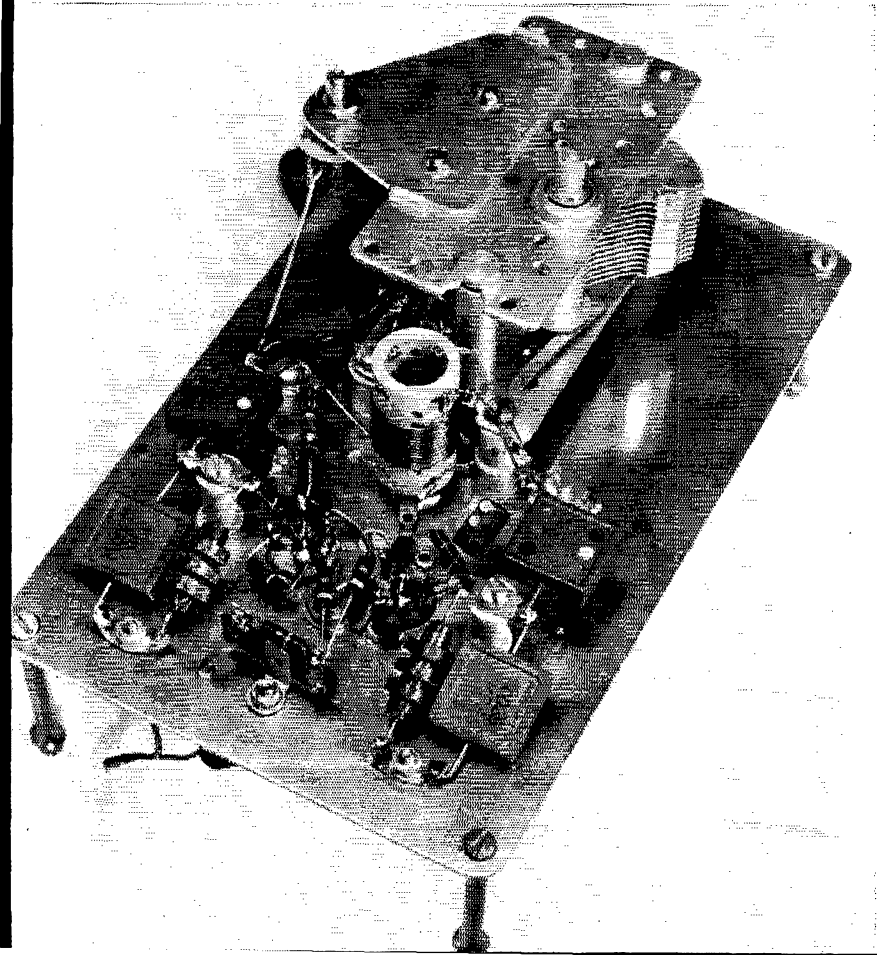


Fig. 3—The oscillator-doubler chassis, showing the layout of the *push-pull oscillator circuit*. Tubes and push-push output circuit are on other side. The parts arrangement is similar to the *circuit layout* in Fig. 2. The two tube sockets are between the ceramic pillars, with resistors and disk-ceramic capacitors clustered around them. V_2 is at the left in this view. C_3 is supported by the triangular plate mounted on the frame of the tuning capacitor, C_1. Ceramic pillars insulate the frame of C_1 from the chassis.

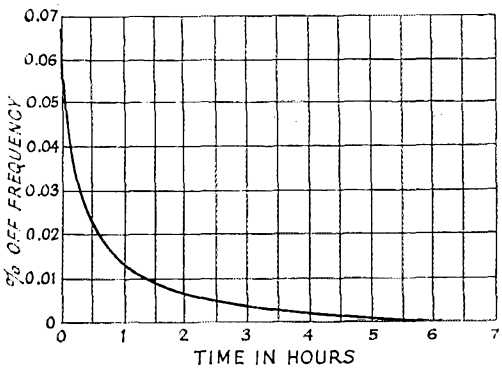


Fig. 4—Warm-up drift characteristic. Total time required to stabilize at the calibrated frequency is 6 hours. Most of the drift occurs within the first half hour or so. No temperature compensation is used, and the construction favors slow warm-up.

plate in this instance is effective in reducing short-term drift under the conditions stated, and ordinary room ambient changes have negligible effect after warm-up. Such procedures tend to extend the initial warm-up period. Fig. 4 gives an idea of what may be expected with unit warm-up in a room at +65° F. The maximum drift takes place in the first hour of warm-up. After the third hour the drift begins to become more linear and eventually approaches 0.001 per cent per hour. After 6 hours the frequency remains quite stable. The long warm-up is also attributable to the fact that the power delivered to the oscillator tubes is low, around 2.5 watts. There are obviously many factors which determine the drift during the warm-up period, not the least of which are the particular structure used and the heating tendencies of any adjacent equipment. The experimenter is thus cautioned to use Fig. 4 as a general guide rather than as absolute design information.

Filament and Plate Voltage

For the circuit shown an increase in heater volts causes a decrease in frequency while an increase in plate volts causes an increase in frequency. Except for the thermal lag in the heater response, there is a compensating affect. It is worthy of note that some measure of improved stability might be achieved by tailoring the resistance of the plate supply to provide best results, when both the heater and plate supply are from a common power-line source. Fig. 5 shows the magnitude of the frequency change for the oscillator of Fig. 2 in response to these varying conditions. The best answer, of course, is to regulate both the heater and the plate source.

Mechanical Considerations

Mechanical instability may contribute considerably to frequency instability. The builder is advised to observe closely the discussion on variable-frequency oscillators in the *ARRL Handbook* (page 146, 1965 edition). This sound information applies equally well to all types of v.f.o. circuits. After construction, the unit should not be sensitive to such things as mechanical vibration and tuning dial and panel pressure. It is usually desirable to use insulated shafts for tuning and trimming drives, or for any other controls that require entrance to the oscillator compartment. A good grade of ¼-inch diameter phenolic rod is satisfactory for most applications.

Unwanted Frequency Modulation

One of the recurring problems in v.f.o. design where the oscillator frequency is multiplied a great many times is the annoying tendency for 60- or 120-cycle frequency modulation of the carrier. (This can sometimes be attributed to plate-supply ripple; the remedy for this is simple and needs no discussion here.) Where the heater is operated on a.c. this can present a problem. The best procedure is to ground one side of the heater directly at the socket with the shortest possible lead to ground. The opposite side of the heater should be by passed with a capacitor of at least 0.001 μf. The capacitor leads should be kept as short as is practicable. It is then desirable to feed the heaters through an r.f. choke close to the socket or sockets, as the case may be. If such an oscillator does exhibit frequency modulation of this type it is a simple matter to operate the heaters on d.c. to see if that is the source of the trouble.

A less common but no less annoying source of frequency modulation is that created by the mechanical vibration of a transformer so situated that energy is acoustically conducted or otherwise coupled to microphonic components in the oscillator such as capacitor plates. Adjacent blower motors can cause similar trouble. These, of course, are good arguments for designing a structure which is not only insensitive to all electrical interference but to acoustic interference as well.

The Amplifier

The amplifier in Fig. 2 is conventional. It uses

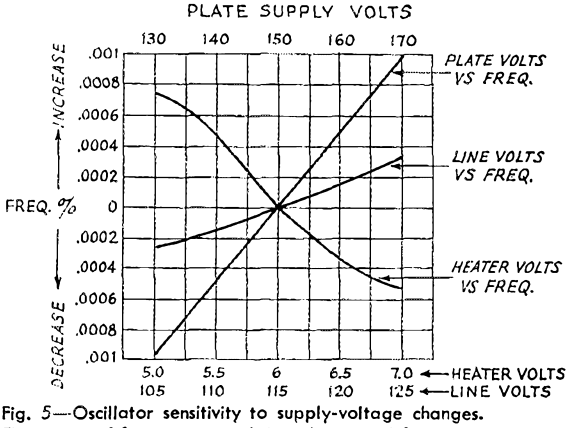


Fig. 5—Oscillator sensitivity to supply-voltage changes. The curves of frequency vs. plate voltage and frequency vs. heater voltage have opposite slopes, leading to inherent voltage compensation when the line voltage is varied.

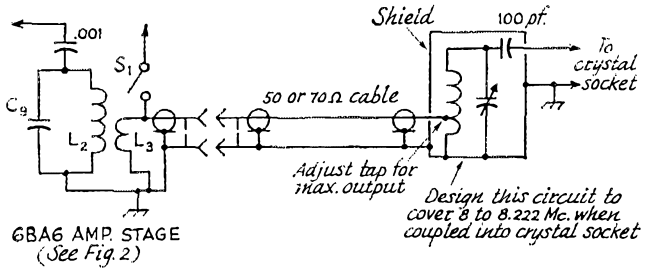


Fig. 6—Suggested method for coupling the output of the v.f.o. unit into the crystal socket of a transmitter. (Note: The crystal oscillator tube will self-oscillate when the tuned coupling circuit is used unless the oscillator circuit is modified to eliminate feedback, or unless the tube is used as a frequency multiplier.)

a 6BA6 biased towards the negative side of the class A characteristic. The input is the untuned and nonresonant output capacitively coupled from the push-push oscillator plates. This untuned input reduces the tendency for the 6BA6 to go into self-oscillation. Good design practice should be observed, nevertheless, in isolating the grid and plate circuits. The amplifier should be mounted in a separate housing adjacent to the oscillator enclosure.

The shunt-fed plate circuit is not essential and is more a matter of individual preference. The output is at low impedance to drive a 50- or 70-ohm line for remote application. The voltage developed across this low impedance will usually require termination in some sort of step-up transformer at the transmitter crystal socket. In this event the circuit of Fig. 6 is recommended. Tuning is not critical, and one or two settings will usually cover the entire band. The low-impedance output is also desirable as a source for the frequency spotter, which does absorb a small amount of power from the output.

The Frequency Spotter

The frequency spotter is extremely useful. It consists of a simple r.f. bridge with a crystal in one leg. Balance is obtained by means of a carbon potentiometer, R_1. The bridge is unbalanced by the crystal at the crystal resonant frequency, causing rectified current to flow in the meter circuit. The schematic of the frequency spotter is included in Fig. 2. All leads should be kept as short as possible and the unit should be enclosed in suitable shielding. The r.f. chokes allow the meter to be positioned anywhere on the panel without interference to the bridge circuit.

The switch S_1 serves to disconnect the bridge from the output circuit during transmission. Aside from absorbing some of the power output, the distortion created by the nonlinear diode rectifier load generates a harmonic spectrum from the 8.0- to 8.222-Mc. source. It is conceivable that in some cases this could cause spurious transmitter output signals. This tendency to generate harmonics may be put to good use for calibrating purposes. If the balance potentiometer, R_1, is rotated to either the maximum clockwise or counterclockwise positions, the 18th harmonic is strong enough to be detected on a receiver of normal sensitivity. If the balance control is set for minimum meter indication the crystal diode current is reduced proportionately and the harmonic strength is reduced. R_1 then serves as a level control for harmonic output. With S_1 open the harmonic output is so low that it cannot be detected. This allows the oscillator to be kept on at all times during reception without interference.

Other Variations

It is possible to use a form of series-tuned Colpitts in a push-pull circuit of the type described. The circuit values must be changed accordingly. In test circuits there did not appear to be any advantage in drift or stability one way or the other. The parallel-tuned circuit oscillates a little more readily unless C_4, C_5, C_6 and C_7 are reduced in value. In the parallel-tuned circuit it was found that these capacitors could be reduced to half the values shown without appreciably changing the stability or drift characteristics. A reduction in capacitance is necessary if the circuit is required to operate at higher frequencies. The circuit has been tested to at least 15 megacycles.

C_8 in Fig. 2 serves to balance the stray capacitance from the frame of the tuning capacitor to ground. It may or may not be necessary to add such a capacitor, depending upon the way the other component values happen to add.

Conclusion

It might be worthwhile to state that after a number of initial warm-up cycles the drift characteristic will probably change. It might get either better or worse. If you are lucky it will get better. This is usually what happens, and in some respects may be attributed to stresses that are gradually relieved in molded capacitors and other components. Final calibration therefore should be postponed until the unit is well broken in. Of course, the crystal spotter and calibration control C_3 make the unit immediately operable regardless of aging or warm-up.

It may be necessary to add some capacitance across the crystal socket in the crystal-spotter circuit, as the crystal will oscillate at a slightly lower frequency in an ordinary oscillator circuit. This should be done by the trial and error method.

Most crystals exhibit more than one resonant frequency. These will show up on the spotter. It is usually the lowest-frequency resonance, showing the greatest magnitude, that determines the crystal frequency. This is immediately recognizable on the spotter. The spotter thus becomes useful as a means of checking and comparing quartz crystals. QST

HIGHLIGHTS OF THE BOARD MEETING

The 1965 Annual Meeting of the ARRL Board of Directors was held May 21 and 22, 1965 at the Chateau Frontenac, Quebec, P.Q. — the first time the Board has met outside the U.S.

The principal agenda item was, of course, FCC Docket 15928, proposing an expansion of the amateur incentive licensing structure. Extensive correspondence in response to the invitation in May *QST*, as well as personal contacts at club meetings and conventions, had equipped directors with substantial knowledge of membership sentiment on the proposals. Directors devoted many hours to this subject — in informal meetings, through discussion in committees set up especially for the purpose of studying specific areas of the Docket, and at the formal meeting itself.

The Board voted unanimously to thank the Commission for its careful and thorough consideration of the League's RM-499 petition, and to support the basic principles of Docket 15928; at the same time, however, the Board offered several alternative approaches and suggestions. The League's comments will ask that Advanced Class (old Class A) licensees be granted the First Class license without further examination. The Board felt that this particular group had shown the incentive to advance when the opportunity was there, and had lost in 1953 the uniqueness of privileges promised to them.

The Board felt that the incentives provided for advancement to First Class were reasonable, but felt that there should be an added incentive for First Class licensees interested primarily in phone to advance to Extra Class; accordingly the League comments will request that the restricted segment of the 21-Mc. phone band proposed by FCC (21.25-21.3 one year after adoption, 21.25-21.35-Mc. two years after adoption) be allowed solely to the Extra Class licenses. The remainder of the phone section, as in other bands, would remain available for use by Conditional, General and First Class licensees.

Quebec Prime Minister Jean Lesage, right, shakes hands with VE2BE, who is flanked by VE2AAH (left) and W6ZH.

PRIME MINISTER WELCOMES BOARD

Dr. Guy Marcoux, M.P. (VE2AMI)
House of Commons
Ottawa, Ontario

Dear Dr. Marcoux:

Thank you for letting me know that the American Radio Relay League is holding, for the first time outside the United States, its annual meeting of the Board of Directors in Quebec City on Thursday, May 20.

I would be grateful if you would extend on my behalf to the Board of Directors and other participants at the meeting a warm welcome and my very best wishes for the success of the deliberations.

Yours sincerely,

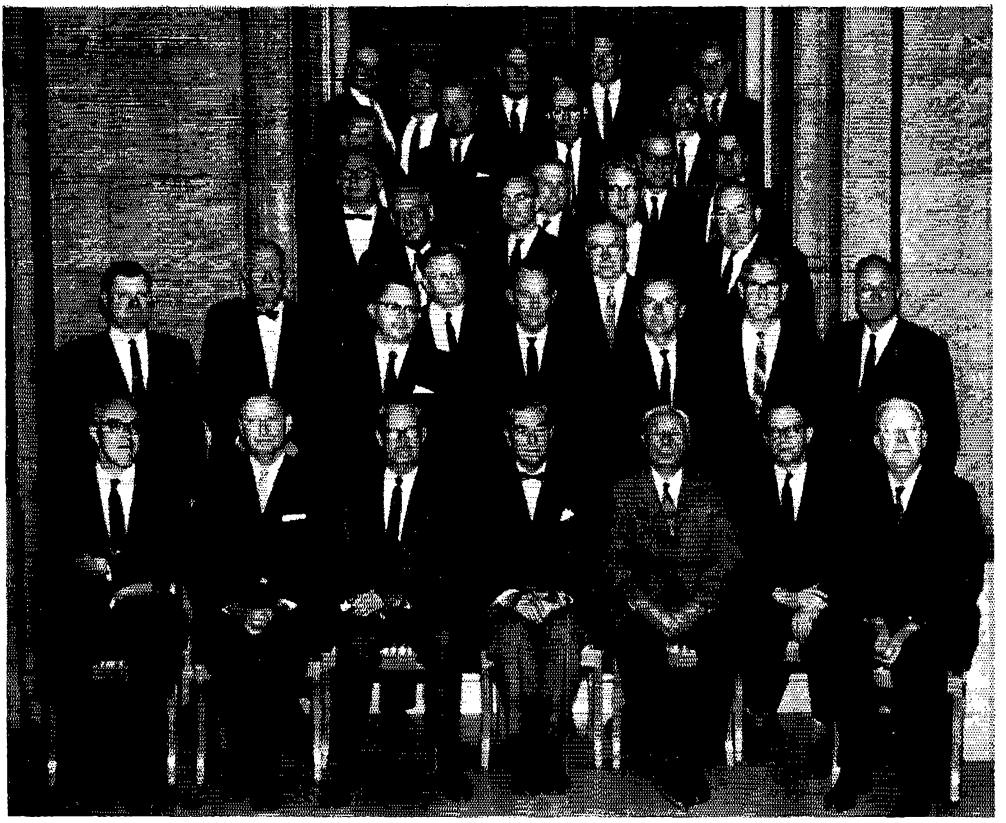
L. B. PEARSON

The directors felt that traditional call signs are regarded by the amateur body as the most desirable, and that therefore the highest class licensees should continue to enjoy call signs bearing the prefixes W, WA, WB or K. If two-letter prefixes are adopted by FCC for identification of license class, the new two-letter prefixes should be assigned to classes of license other than Amateur Extra. The Board also felt strongly that an individual amateur should hold the same numeral and suffix throughout his amateur career, to the maximum extent possible. The Board suggested that if one letter suffixes are used, it should be for special events stations only.

Among the proposed segments to be set aside for Extra and First Class in FCC's docket were 250 kc. on six meters and 1 Mc. on two meters. The ARRL will ask FCC to postpone any such action, and the Board has asked the staff to study the matter of incentives for those operators who are interested only in the bands above 50 Mc. The League will separately request FCC to require two volunteer examiners be continuously present during the supervision of code and theory tests for Conditional and Technician Class licensees.

The Board conferred the 1965 Technical Merit Award on Project Oscar, Inc., in recognition of outstanding achievements embodied in Oscar III. The group had also received the award in 1962. The Board also expressed its continued moral and financial support of the Project Oscar effort.

As concerns League elections, a minor change was made to permit mailing of ballots by Headquarters during the second week in October.



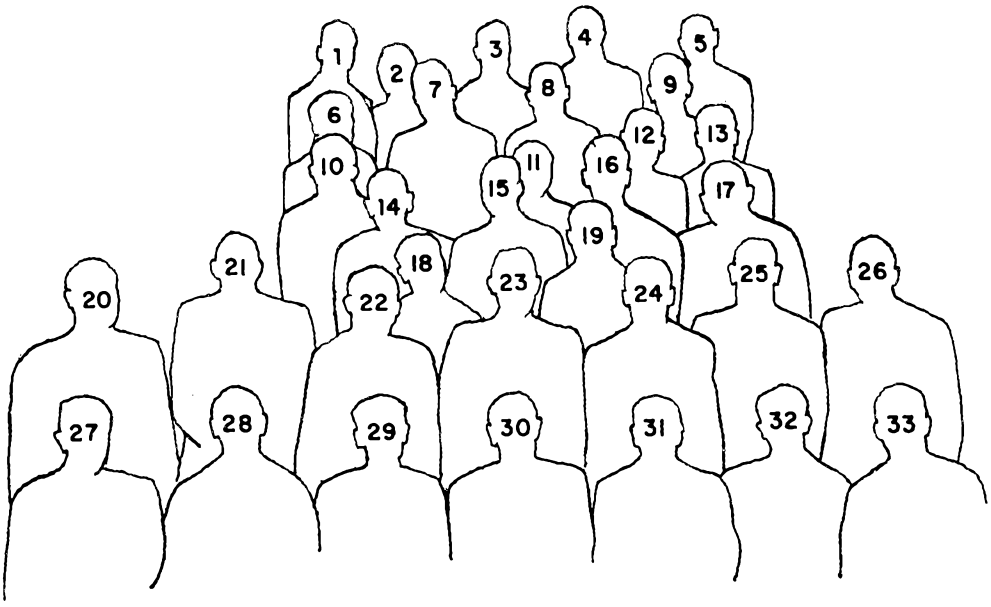
Outer envelopes will be marked to indicate that ballots are contained therein so as to reduce the possibility of a member's family mistaking them for "junk" mail. The envelope will also carry a return postage guarantee. The Board rejected a proposal looking toward runoff elections where there are more than two candidates and none receives an absolute majority.

The president was given authority through an amendment of the By-Laws to fill vacancies on the Executive Committee occurring between meetings of the Board. A proposal to remove the present non-voting members of the Committee and replace them with two additional directors for a total of six was defeated. P. Lanier Anderson, W4MWH, director of the Roanoke Division since 1953, was newly elected to the Executive Committee, and Directors Compton, Denniston and Eaton were reelected. The General Counsel was asked to study the Articles of Association and By-Laws and make recommendations as necessary to the Board. He will also study the matter of "absentee" ballots for amateurs temporarily resident outside their home division, reporting to the Executive Committee.

The rules for National Conventions were changed to make it clear that the management, program and financial plans of every such convention shall be subject to the joint approval of the director concerned and the Executive Committee. The Board approved the holding of the 1966 National Convention at Boston, April 22-24, 1966, and granted preliminary approval of a National at San Antonio in 1968, in connection with the "Hemisfair" to be held there. (The 1967 affair has already been scheduled for Montreal and plans are going forward).

The Board asked the General Manager and the staff to examine the matter of radio frequency interference from non-radio sources and to present some additional material thereon to the members through *QST*. The Executive Committee was given authority to hire public relations counsel for the League at reasonable cost, but particular public relations programs previously offered the League were not accepted because of the high costs.

Studies were ordered on the divisional status of members in the Pacific and West Indies possessions both for operating and administrative matters; the boundaries of Communications Department sections in Florida; extending insurance coverage to SECs and SCMs while traveling for the League; the number of members and physical size of the various divisions in relation to one another; more programming assistance for affiliated clubs; the possibility of moving National Calling and Emergency Frequencies to integral 100-kc. points; and the election of members-at-large to the contest



The officers, directors, vice directors and staff members at the 1965 Board meeting in Quebec (Last names and calls appear below; full name and title appear in the rollcall, item one of the minutes): 1. Meen, VE3RX; 2, Baldwin, W1IKE; 3, Sampson, W7OCX; 4, Booth, W3PS; 5, Grammer, W1DF; 6, Moss, W4HYW; 7. Metzger, W9PRN; 8, Engwicht, W6HC; 9, Williams, W1UED; 10, Chapman, W1QV; 11, Compton, WØBUO; 12, Cassen, W4WBK; 13, Bolvin, W4LVV; 14, Best, W5QKF; 15, Shepherd, W6QJW; 16, Eaton, VE3CJ; 17, Dumbrille, VE2BK; 18, Cartwright, W8UPB; 19, Thurston, W7PGY; 20, Dannals, W2TUK; 21, Van Deusen, W3ECP; 22, Spencer, W5LDH; 23, Smith, WØBWJ; 24, Denniston, WØNWX; 25, Haller, W9HPG; 26, Crossley, W3YA; 27, Handy, W1BDI; 28, Anderson, W4MWH; 29, Groves, W5NW; 30, Hoover, W6ZH; 31, Reid, VE2BE; 32, Huntoon, W1LVQ; 33, Houghton.

committee within the Communications Department. The directors again authorized the travel of SCMs, SECs and QSL managers, as in traditional patterns, and also authorized some travel by 18 volunteer officials of the National Traffic System above the section level. Reimbursement for travel by private car on League business was raised from 8½ to 9¢ per mile.

The League will continue such steps as appear desirable to support the RACES program and to seek ways of eliminating inherent weaknesses in the administration thereof. Reports were heard from Directors Denniston and Eaton on the first meeting of the Executive Committee of the Interamerican Union of Radio Amateurs — Region II of the IARU.

The Board offered its sincere congratulations to the International Telecommunications Union on its 100th anniversary (it having been founded as the International Telegraph Union in 1865). The Board also commended the Radio Amateur de Quebec, Inc. and the Radio Club de Quebec for their warm hospitality and for the completeness and convenience of the physical arrangements for the meeting. The Board also commended the vice directors present at the meeting at their personal expense for their interest in League affairs. Thanks were given to the personnel of the various U.S. and Canadian governmental agencies dealing with amateurs for their continued cooperation in the past year. The Board again expressed its appreciation for the work of the volunteer officials and for the continued contributions to the Building Fund.

The full minutes of the meeting appear at the end of this department.

STAFF NOTES

Headquarters is pleased to announce the addition to the technical staff of M. F. "Doug" De Maw, W8HHS/W1CER. Doug received a B.S.E.E. degree from Lawrence Institute of Technology, Michigan, in 1949. He qualified for an amateur license in 1950, and has been active on all bands from 1.8 through 432 Mc. A builder from the start, Doug has been interested in circuit and antenna development. With three years as editor and publisher of the *VHFER*, he has excellent background for his work at ARRL, which includes the editing of technical articles submitted for *QST* by League members in the field and the writing of technical articles of his own. Watch for forthcoming info on a s.s.b. rig for v.h.f., and for a solid-state v.h.f. mobile rig.

Lillian M. Salter, W1ZJE, recently completed her 35th year on the Headquarters staff. As "first sergeant" of Ed Handy's "troops," she is well-known to club officers, field appointees and SCMs, whose Station Activities copy she edits each month.

Dick and Beth Miller, WA4ECJ and WA4EFP respectively, are shown holding the 1965 Sidebander of the Year plaque presented jointly to them by the South Carolina Single Sideband Net at the annual banquet on May 1. The presentation was made by W4WQM who was, with her OM, K4JVV, the recipient of the 1963 award.

SUSPENSIONS AND REVOCATIONS

In the past year there have been few actions by FCC against amateur licensees. Of approximately fifteen cases, one was settled by payment of a $25 forfeiture, five have been dismissed without disciplinary action, and four have resulted in suspension of the operator license or revocation of the station license. The remainder are still in process.

The station license of Marvin E. Nelson, Jr., WSUNB, of Cleveland, Ohio, was revoked effective October 26, 1964 for failure to reply to correspondence from the FCC. Originally, he had received an Official Notice of Violation mailed January 29, 1964 for radiation of spurious emissions. The station license of Melvin Weiss, W1NME, of Swampscott, Massachusetts, was also revoked for failure to answer FCC correspondence; revocation became effective November 11, 1964.

The Technician Class operator license of Dennis Jay Lazar, KSTSQ, of Groton, Connecticut and Shaker Heights, Ohio, was suspended for the remainder of the license term effective October 29, 1964 upon a finding by the Commission that he had obtained a Novice Class license by fraudulent means on or about July 17, 1963. No request for a hearing was received by FCC.

The Technician Class operator license of Richard A. Wilk, WA2JTE, of Irvington, New Jersey, was suspended for the remainder of the license term, effective April 25, 1965. The Commission found that he had assisted Edwin R. Steinheim of Irvington to attempt to obtain an operator's license by fraudulent means. FCC received no request for a hearing from Mr. Wilk.

EXAMINATION SCHEDULE

For the convenience of those planning to take an FCC examination for General or Extra Class license, we present below a tentative schedule of dates and places for the latter half of 1965. All examinations begin promptly at 9 A.M. except as noted. IMPORTANT: New rules require that an applicant submit his application Form 610 (January, 1964 revision) *in advance*, particularly when he wishes to appear at one of the field points. The application, accompanied by a check or money order for $4.00, should be sent to the Engineer-in-Charge of the district in which the applicant resides. Where the schedule below indicates a choice of dates or places, the applicant may indicate his preference. The District Engineer will then notify the applicant when and where to appear. (Applicants for Novice, Technician or Conditional Class licenses should follow the procedures outlined on page 79 of December, 1963 *QST* or in current editions of the *License Manual.*)

Albuquerque, New Mexico: October 9, 1:00 P.M.
Anchorage, Alaska, Room 55, U.S. Post Office Building: By appointment.
Atlanta, Georgia, 2010 Atlanta Merchandise Mart, 240 Peachtree Street NE: Tuesday and Friday, 8:30 A.M.
Baltimore, Maryland, 415 U.S. Customhouse, Gay and Water Streets: Monday and Friday, 8:30–10:00 A.M., and by appointment.
Beaumont, Texas, 301 Post Office Building, 300 Willow Street: Tuesday and Thursday by appointment.
Birmingham, Alabama: September 2 and December 2, 1:00 P.M.
Boise, Idaho: Sometime in October.
Boston, Massachusetts, 1600 Customhouse: Wednesday, Thursday and Friday, 8:30–10:00 A.M.
Buffalo, New York, 328 Post Office Building: First and Third Friday.
Charleston, West Virginia: Sometime in September and December.
Chicago, Illinois, 1872 U.S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in August and November.
Cleveland, Ohio: Sometime in September and December.

Finally after years of work, reciprocal operating becomes a practical reality. Here, Mrs. Grace Glorioso, TI2MAG/W5 received the first permit granted to an alien under Public Law 88-313 (The "Goldwater Bill") and Subpart G, Part 97 of the FCC rules, from William J. Simpson, W5DQB, Engineer-in-Charge of the FCC office at New Orleans (right). ARRL Delta Division Director Philip P. Spencer, W5LDH (left) and Angelo Glorioso, W5KSI, OM of TI2MAG/W5, look on happily.

The Washington Television Interference Committee has been especially commended by Frank M. Kratokvil, W3BA, Chief, Field Engineering Bureau, FCC, for their outstanding work over a twelve-year period. Here courtesy of K3QDC, is a photo of the group hard at work, with the following people present, not necessarily in order: W3AIR; K4SYP; K3OSZ; KKI2232; Frank Wright of WTTG-TV; Dewey H. Redden, Potomac Electric Power Co.; W3USW; K4HTA; W3FMC; K3EYU (guest); W3GCO; W4DNI; WA4THX; K3HFV, W3EPC, W4CIZ of FCC; K3QDC; W3AFV of WTOP; K3GSQ of American Technical Services; K3TGY; K3PAP; K3PZM of WTTG and W3AKB.

Columbus, Ohio: Sometime in July and October.
Corpus Christi, Texas: September 2 and December 2.
Dallas, Texas, Room 707, 1314 Wood Street: Tuesday, 8 A.M.–1 P.M.
Davenport, Iowa: Sometime in July and October.
Denver, Colorado, 521 New Customhouse: First and second Thursday, 8:00 A.M.
Des Moines, Iowa: Sometime in September and December.
Detroit, Michigan, 1029 Federal Building: Wednesday and Friday.
El Paso, Texas: November 16.
Fairbanks, Alaska: Sometime in November.
Fort Wayne, Indiana: Sometime in August and November.
Fresno, California: Sometime in September and December.
Grand Rapids, Michigan: Sometime in July and October.
Great Falls, Montana: Sometime in September.
Hartford, Connecticut: September 15.
Hilo, Hawaii: October 5.
Honolulu, Hawaii, 502 Federal Building, 335 South King Street: Tuesday, Wednesday and Thursday, 8:00–9:30 A.M. and by appointment.
Houston, Texas, Room 5636, New Federal Office Building: Tuesday.
Indianapolis, Indiana: Sometime in August and November.
Jackson, Mississippi: December 1, 1:00 P.M.
Jacksonville, Florida: October 13 and 14.
Jamestown, North Dakota: October 13, 1:00 P.M.
Kansas City, Missouri, 3100 Federal Office Building, 911 Walnut Street: Thursday and Friday, 8:30–11:00 A.M.
Knoxville, Tennessee: September 15 and December 15, 1:00 P.M.
Lihue, Kauai, Hawaii: November 2.
Little Rock, Arkansas: August 4 and November 3, 1:00 P.M.
Los Angeles, California, Room 50, 849 South Broadway: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Kentucky: Sometime in August and November.
Lubbock, Texas: November 11.
Memphis, Tennessee: July 15 and October 7, 8:30 A.M.
Miami, Florida, Room 919, 51 S.W. First Avenue: Thursday.
Milwaukee, Wisconsin: Sometime in July and October.
Mobile, Alabama, 439 U.S. Court and Customhouse: Wednesday by appointment.
Nashville, Tennessee: August 4 and November 3, 1:00 P.M.
New Orleans, Louisiana, 829 Federal Office Building South, 600 South Street: Monday, 8:30 A.M.
New York, New York, 748 Federal Building, 641 Washington Street: Tuesday through Friday, exam must be started by noon.
Norfolk, Virginia, 405 Federal Building: Friday, 9:00 A.M. to 4:30 P.M.
Oklahoma City, Oklahoma: July 16 and October 15.
Omaha, Nebraska: Sometime in July and October.
Philadelphia, Pennsylvania, 1005 New U.S. Customhouse: Monday, Tuesday and Wednesday, 9:00–10:00 A.M.
Phoenix, Arizona: Sometime in July and October.
Pittsburgh, Pennsylvania: Sometime in August and November.
Portland, Maine: October 12.
Portland, Oregon, 441 New U.S. Courthouse, 620 S.W. Main Street: Friday.
Roanoke (Salem), Virginia: October 6.
St. Louis, Missouri: Sometime in August and November.
St. Paul, Minnesota, 208 Federal Courts Building, Sixth and Market Streets: Friday, 8:45 A.M.
Salt Lake City, Utah: September 10 and December 17, 1:00 P.M.
San Antonio, Texas: August 5 and 6, and November 4 and 5.
San Diego, California, Fox Theatre Building, 1245 Seventh Avenue: Wednesday by appointment.
San Francisco, Calif., 323A Customhouse, 555 Battery Street: Friday, 8:30 A.M.
San Juan, Puerto Rico, 322-323 Federal Building: Friday.
Savannah, Georgia, 238 Post Office Building: By appointment.
Schenectady, New York: September 15 and 16, and December 1 and 2; 9:00 A.M., and 1:00 P.M.
Seattle, Washington, 806 Federal Office Building, First and Marion Street: Friday.
Sioux Falls, South Dakota: September 14 and December 14, 1:00 P.M.
Spokane, Washington: Sometime in October.
Syracuse, New York: Sometime in July and October.
Tampa, Florida, 738 Federal Building, 500 Zack St., By appointment.
Tucson, Arizona: Sometime in October.
Tulsa, Oklahoma: July 14 and October 13.
Wailuku, Maui, Hawaii: October 19.
Washington, D.C., Room 204, 521 12th Street, N.W.: Friday, 9:30 A.M., and 1:00 P.M.
Wichita, Kansas: Sometime in September.
Williamsport, Pennsylvania: Sometime in September and December.
Wilmington, North Carolina: December 1.
Winston-Salem, N. C.: August 4 and November 3.

The Quebec hosts check last minute arrangements for the Board meeting. Left to right, VE2NK, VE2LG, VE2AAH and VE2AB.

Minutes of the 1965 Annual Meeting of the Board of Directors

The American Radio Relay League, Inc.
May 21-22, 1965

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in annual session at the Chateau Frontenac, Quebec City, P.Q., on May 21, 1965. The meeting was called to order at 9:55 A.M., with President Herbert Hoover, Jr., in the Chair and the following directors present:

P. Lanier Anderson, Jr., Roanoke Division
Roemer O. Best, West Gulf Division
Dana E. Cartwright, Great Lakes Division
Robert Y. Chapman, New England Division
Charles G. Compton, Dakota Division
Gilbert L. Crossley, Atlantic Division
Harry J. Dannals, Hudson Division
Robert W. Denniston, Midwest Division
Noel B. Eaton, Canadian Division
Harry M. Engwicht, Pacific Division
Philip E. Haller, Central Division
Thomas M. Moss, Southeastern Division
Howard F. Shepherd, Southwestern Division
Carl L. Smith, Rocky Mountain Division
Philip P. Spencer, Delta Division
Robert B. Thurston, Northwestern Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, First Vice President; Alex Reid, Vice President; F. E. Handy, Vice President; John Huntoon, General Manager. Also in attendance, at the invitation of the Board as non-participating observers, were Atlantic Division Vice Director Edwin S. Van Deusen, Canadian Division Vice Director Colin C. Dumbrille, Central Division Vice Director Edmond A. Metzger, Delta Division Vice Director Franklin Cassen, Rocky Mountain Division Vice Director John H. Sampson, Jr., and Southeastern Division Vice Director Charles J. Bolvin. There were also present Treasurer David H. Houghton, General Counsel Robert M. Booth, Jr., Associate Counsel for Canada Arthur K. Meen, Assistant General Manager Richard L. Baldwin, Technical Director George Grammer and Assistant Secretary Perry F. Williams.

2) On motion of Mr. Crossley, unanimously VOTED that the minutes of the 1964 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) On motion of Mr. Haller, unanimously VOTED that the Annual Reports of the officers to the Board of Directors are accepted and the same placed on file.

4) Mr. Anderson, as Chairman, presented the report of the Finance Committee; Mr. Crossley, as Chairman, presented the report of the Planning Committee; Mr. Best, as Acting Chairman, presented the report of the Membership and Publications Committee; on request of Mr. Compton, as Chairman, RULED by the Chair that the report of the Public Relations Committee goes over to Item 10 of the agenda; Mr. Groves, as Chairman, presented the report of the Merit and Awards Committee; Mr. Compton, as Chairman, presented the report of the Special Committee on Election Procedures.

5) On motion of Mr. Denniston, unanimously VOTED that the Annual Reports of the directors to the Board of Directors are accepted and the same placed on file.

6) At this point the Chair read a telegram conveying news of the passing of Commander Charles Winnette, a former Chief of Navy MARS; the Board unanimously requested the transmittal of a message of sympathy in recognition of Commander Winnette's long record of unselfish devotion to the advancement of the Military Affiliate Radio System and his long-standing cooperation with the League and the Amateur Radio Service.

7) At this point, supplementary oral reports were rendered by the officers of the League and the General Counsel.

8) There followed a discussion of the incentive-licensing proposals in FCC Docket 15928; whereupon, with unanimous consent, the Chair appointed the following committees to examine specific areas of the proposal, confer with other directors, and present recommendations to the Board:

a) As concerns the status of the Advanced Class license — Messrs. Anderson (Chairman), Denniston and Smith
b) As concerns call signs — Messrs. Compton (Chairman), Cartwright and Crossley
c) As concerns all other matters — Messrs. Best (Chairman), Engwicht and Groves

9) On motion of Mr. Compton, unanimously VOTED, at 10:50 A.M., that the Board now recess to permit the named committees to undertake their assignments and prepare recommendations to the

His Worship Mayor Wilfrid Hamel greets W6ZH while VE2NK and VE2BE await their turns.

Board. The Board re-assembled at 10:00 P.M., with all persons hereinbefore mentioned in attendance.

10) On motion of Mr. Moss, after discussion, unanimously VOTED that the Communications Manager continue his study of possible revisions in the section boundaries within the State of Florida.

11) On motion of Mr. Moss, after discussion, unanimously VOTED that the Planning Committee shall undertake a study of the status of amateurs licensed by the United States in the Caribbean and the Pacific areas as concerns their status both in the field operating and administrative functions of the League.

12) Moved, by Mr. Moss, after extended discussion, that the Planning Committee undertake a study to determine whether director elections should be on the basis of a simple majority vote, instead of a plurality, of the full members voting in the election; but, after discussion, the motion was REJECTED, 4 votes in favor to 12 opposed.

13) Moved, by Mr. Moss, that By-Law 14 be amended so as to provide that ballots in elections for director, vice director and section communications manager be dispatched by first-class mail. On motion of Mr. Smith, VOTED, 15 in favor to 1 opposed, that the matter be laid on the table until the Board has acted on the report of the Special Committee on Election Procedures.

14) On motion of Mr. Groves, unanimously VOTED that the Board now takes up Item 10 of the agenda, concerning reports of its standing committees.

15) On motion of Mr. Anderson, unanimously VOTED to accept the report of the Finance Committee.

16) On motion of Mr. Crossley, unanimously VOTED to accept the report of the Planning Committee. Moved, by Mr. Crossley, that the last line in Section 4 of the Rules and Regulations concerning ARRL conventions be made to read: "The management, program and financial plans of every such convention shall be subject to the joint approval of the director concerned and the Executive Committee." After extended discussion, on motion of Mr. Spencer, VOTED, 10 votes in favor to 4 opposed, that the matter is laid on the table.

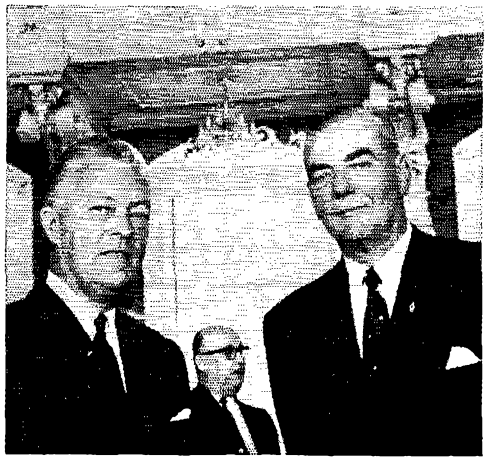
17) On motion of Mr. Best, unanimously VOTED to accept the report of the Membership and Publications Committee.

18) Mr. Compton, as Chairman, presented the report of the Public Relations Committee, and on his motion, the Board unanimously VOTED to accept the report. On motion of Mr. Spencer, after extended discussion, unanimously VOTED that the Executive Committee is authorized to employ public relations counsel and to expend such monies as may be necessary for such purposes.

19) On motion of Mr. Groves, unanimously VOTED to accept the report of the Merit and Awards Committee. On motion of Mr. Smith, unanimously VOTED that the word "technical" be inserted in the title of the ARRL Merit Award to clarify that this award is for recognition of amateurs chosen for outstanding technical contributions to the art of amateur radio communication.

20) The Board was in recess from 11:07 P.M. to 11:27 P.M.

21) On motion of Mr. Moss, unanimously VOTED that Project Oscar, Incorporated, be awarded the ARRL Technical Merit Award for 1965 in recognition of its Oscar III amateur space communications achievements. Messrs. Engwicht and Shepherd, as members of the Board of Project Oscar, wished to be recorded as abstaining.



Quebec Prime Minister Jean Lesage and ARRL President W6ZH.

22) On motion of Mr. Compton, unanimously VOTED to accept the report of the Special Committee on Election Procedures. On further motion of Mr. Compton, unanimously VOTED that the Secretary is instructed to mail director, vice director, and SCM ballots in envelopes imprinted with the words "Official Ballot Enclosed" and "Return Postage Guaranteed."

23) Moved, by Mr. Smith, that By-Law 14 be amended by deleting the word "first" and substituting therefore the word "second", thereby changing the fourth sentence to read as follows: "If there be more than one eligible nominee, then during the second week of October the Secretary shall send by mail to every person who on the 20th day of September of that year was a full member of the League in the divisions in which elections are being held, a ballot listing the candidates for director in his division, and a return envelope, soliciting a vote for one name." The ayes and nays being ordered,

One of the features arranged by the Quebec hosts for the Board included a visit to the Provincial Parliament, a standard item for visiting convention groups. In this instance, however, the visit was far from standard. Quebec's Prime Minister Jean Lesage addressed the group for about 10 minutes and then took the ARRL visitors on a personally guided tour of the parliamentary building, concluding with coffee in the official dining room. A portion of his remarks is reproduced below:

"You amateurs deserve commendation from all those responsible for the conduct of public affairs. You have rendered immense service in various fields of endeavor — e.g., emergencies — and thus service to humanity. Amateur radio is the human side of technology, and very important as such. We are often so busy with our day-to-day scientific achievements and progress that we at times forget the social and human side."

W6ZH and W1LVQ

the question was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 12; ayes, 16; nays, 0. All the directors voted in the affirmative. So the By-Law was amended.

24) On motion of Mr. Groves, unanimously VOTED that the Board now proceed to hear and consider the reports of the three special committees appointed by the President concerning proposals in FCC Docket 15928. Whereupon the Board heard the reports of its special committees.

25) On motion of Mr. Anderson, unanimously VOTED that the League expresses its appreciation to the Federal Communications Commission for its careful and thorough consideration of the League's incentive licensing proposal, RM-499, and endorses the principles of incentive licensing included in the Notice of Proposed Rulemaking in Docket 15928. (Mr. Eaton abstained, in accordance with the By-Laws.)

26) On motion of Mr. Anderson, after extended discussion, the following resolution was unanimously (Mr. Eaton abstaining) ADOPTED:

> WHEREAS, every present Advanced Class licensee operated for at least one year with a lower class of license and with restricted frequency privileges before becoming eligible for the Advanced Class license, with a limited number of exceptions; every present Advanced Class licensee upgraded his license from General (Class B) to Advanced (Class A) by passing a written examination involving elements more difficult than those of lower classes; and holders of Advanced Class (who formerly held Class A) licenses reached the highest grade license attainable under the incentive licensing system then in effect,
>
> NOW, THEREFORE, BE IT RESOLVED, that the American Radio Relay League, by its Board of Directors assembled, recommends to and requests the Federal Communications Commission to issue First Class licenses to any Advanced Class licensee at his request or at his next application for modification or renewal, and that until such issuance, the Advanced Class licensee should have all privileges of the First Class licensees.

27) On motion of Mr. Compton, after extended discussion, unanimously (Mr. Eaton abstaining) VOTED that the General Manager and General Counsel file with the Federal Communications Commission comment concerning the call-sign proposals in Docket 15928 based on the following principles:

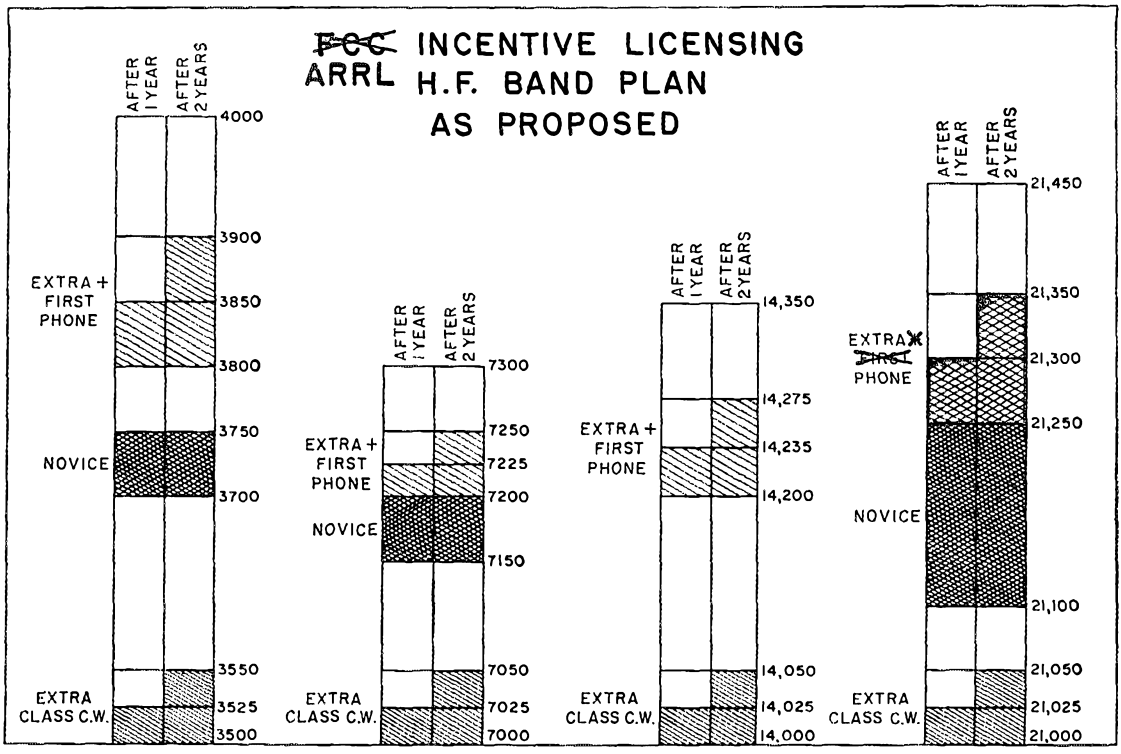
a) An amateur should retain the same suffix throughout his amateur career, if he so desires, by use of prefixes to denote the class of license.
b) Amateur Extra Class licenses should bear one of the following prefixes: K, W, WA and WB.
c) Single-letter suffix call signs should be assigned only to special event stations.

28) On motion of Mr. Best, after extended discussion, unanimously (Mr. Eaton abstaining) VOTED to adopt the following recommendations concerning other aspects of Docket 15928:

a) That the Amateur Extra Class license be retained and continued.
b) That the League support the proposal to establish the First Class license.
c) That the Federal Communications Commission be requested to postpone the adoption of restrictions on operation in the 50- and 144-Mc. bands, pending further study and recommendations of the League.
d) That the League supports the proposals concerning the Novice Class.
e) That the Federal Communications Commission be requested to modify its proposals concerning operating privileges in the 21-Mc. band to provide that only the Amateur Extra Class be permitted to operate radiotelephony in the band from 21,250 to 21,300 kc. beginning one year after adoption of the new rule, and from 21,250 to 21,350 kc. in addition, beginning two years after adoption of the new rule.
f) That, WHEREAS, in 1933 the Federal Radio Commission downgraded Amateur Extra First Class licensees, who had passed a 20-word-per-minute code test and a written examination corresponding to the written examination of the present Amateur Extra Class examination to Class A and later Advanced Class,

NOW, THEREFORE, BE IT RESOLVED that the American Radio Relay League, by its Board of Directors assembled, recommends to and requests the Federal Communications Commission to issue Amateur Extra Class licenses to former Amateur Extra First Class licensees who have had continuous amateur service (licensed) since the Amateur Extra First Class license was discontinued, upon appropriate application and payment of a reasonable fee without further examination.

WØBUO and W8UPB



The chart shows in black the FCC proposals for restricted subbands and in red the ARRL suggestions for modification thereof.

29) On motion of Mr. Moss, unanimously (Mr. Eaton abstaining) VOTED that, in the interest of creating appropriate operating activities and the training of new amateur radio operators, the headquarters staff is requested to make a study of possible authorizations for c.w. telegraphy operation by Novices within the 28-Mc. band, and make recommendations to the Board thereon.

30) On motion of Mr. Shepherd unanimously VOTED that the General Manager is directed forthwith to institute a staff study of possible incentive proposals for the 6- and 2-meter amateur bands, with special consideration given to satellite operations, and the report thereon to be made available to the members of the Board.

31) On motion of Mr. Shepherd, after discussion, unanimously (Mr. Eaton abstaining) VOTED that the League petition the Federal Communications Commission requesting that the amateur rules be amended to provide that the examination for Conditional and Technician Class licenses shall be conducted and supervised by two volunteer examiners with respect to both the code test and written portions.

32) On motion of Mr. Shepherd, after discussion, unanimously VOTED that the General Manager shall conduct such investigations and take such steps as he shall deem necessary to aid amateurs in detecting and reducing radio frequency interference (RFI) arising from non-communications equipment, including but not limited to radiation from power distribution services, electrical appliances, and similar spurious radiations.

33) On motion of Mr. Best, unanimously VOTED that the Board expresses its sincere thanks and appreciation for the untiring work and devotion to the League and to amateur radio by the vice directors, assistant directors, SCMs, SECs, QSL managers, and all other members of the League, and it is the sense of the Board that their contribution to amateur radio has done much to enhance amateur radio in the field of public service, convenience and necessity.

34) On motion of Mr. Best, unanimously VOTED that the Board expresses its deepest appreciation to the several vice directors present for the demonstration of interest in League affairs by their attendance at this meeting, since vice directors incur the expense of attendance out of their own pockets and are to be commended for their interest in the American Radio Relay League and actions of the Board, their attendance and interest as well as their devotion to the League going beyond the call of duty.

35) On motion of Mr. Best, unanimously VOTED that the Board commend the General Counsel and the Associate Counsel for Canada for their extensive efforts beyond the call of duty in assisting the League members and the local attorneys involved in regulatory difficulties encountered during the past year, and to commend Mr. Booth for his continuing regular representation of the League in its Washington affairs. (Applause)

36) On motion of Mr. Best, unanimously VOTED that preliminary approval be granted for the holding of an ARRL National Convention, with the San Antonio Radio Club as sponsor, in San Antonio, Texas, in 1968, in connection with their "Year of the Hemisfair," a world fair to be held in San Antonio in 1968.

37) Moved, by Mr. Eaton, that By-Law 26 be amended by adding the following at the end of the present By-Law: "Any vacancy occurring from

BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, assistant directors, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

time to time by death, resignation or incapacity of any member of the Executive Committee, may be filled by appointment made by the President, for the balance of the original term of such member." After discussion, the ayes and nays being ordered, the question was decided in the affirmative; whole number of votes cast, 16; necessary for adoption, 12; ayes, 16; nays, 0. All the directors voted in the affirmative. So the By-Law was amended.

38) On motion of Mr. Haller, unanimously VOTED that the General Manager is requested to investigate arrangements to bring the Section Communication Managers and Section Emergency Coordinators into the League's travel insurance plan.

39) Mr. Spencer moved the adoption of the following resolution:

WHEREAS, the Articles of Incorporation of the American Radio Relay League have a provision presently for four elected voting directors on the Executive Committee; and WHEREAS, the growth and needs of the League have greatly increased since the creation of the present composition of the Executive Committee; and WHEREAS, the Board of Directors of ARRL recognizes that more representation on the Executive Committee by the elected directors is both desirable and in keeping with the long-range objectives of ARRL; and WHEREAS, modern advances in transportation make it possible to replace the present non-voting representatives of the Executive Committee with two additional elected voting directors; and WHEREAS, the Board of Directors of ARRL has been unjustly accused of not being fairly represented on the Executive Committee as to reflecting the policies of the Board and feeling that the addition of two additional members of this group would enhance both the efficiency of the Board and the amateur image of the Executive Committee;

NOW, THEREFORE, BE IT RESOLVED, that the second sentence of Article 7 of the Articles of Association be changed to read as follows: "The Board of Directors, in its discretion, may also appoint from amongst its members not more than six additional members of the Executive Committee to serve for fixed terms between regular meetings of the Board of Directors," and that the third sentence of Article 7 be deleted.

After extended discussion, the ayes and nays being ordered, the question was decided in the negative. Whole number of votes cast, 14; necessary for adoption, 11; ayes, 3; nays, 11. Messrs. Best, Moss and Spencer voted in the affirmative. Messrs. Anderson, Cartwright, Compton, Crossley, Dannals, Denniston, Eaton, Engwicht, Haller, Shepherd and Smith voted opposed. Messrs. Chapman and Thurston abstained. So the resolution was rejected.

40) On motion of Mr. Smith, unanimously VOTED, at 12:56 A.M. May 22, that the Board now recess until a time set by the Chair. The Board reassembled at the same place at 9:25 A.M. on May 22, with all persons hereinbefore mentioned in attendance except Vice Director Sampson.

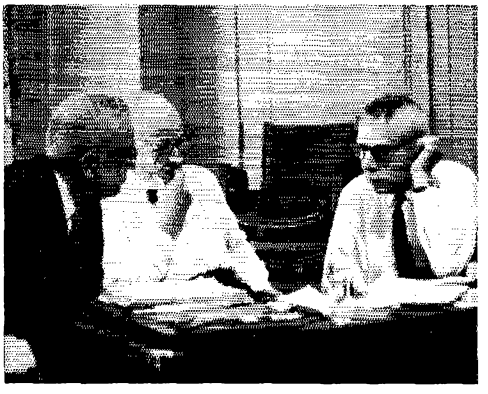
41) On motion of Mr. Spencer, unanimously VOTED that the General Counsel and the Associate Counsel for Canada are authorized to make a study of the Articles and By-Laws and make recommendations at the next annual meeting of the Board of any changes deemed advisable, with emphasis on eliminating any inconsistencies or omissions.

42) On motion of Mr. Spencer, unanimously VOTED that, because of his necessity to depart from the meeting shortly, the Board now take up items 9a and 11 of the agenda, relating to director administrative expense authorizations and the selection of members of the Executive Committee.

43) On motion of Mr. Thurston, after discussion, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1965, in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$1500
Atlantic Division Director	2400
Central Division Director	2500
Dakota Division Director	800
Delta Division Director	2400
Great Lakes Division Director	2300
Hudson Division Director	2000
Midwest Division Director	900
New England Division Director	2000
Northwestern Division Director	1800
Pacific Division Director	2500
Roanoke Division Director	750
Rocky Mountain Division Director	1600
Southeastern Division Director	2300
Southwestern Division Director	2500
West Gulf Division Director	2200

44) On motion of Mr. Shepherd, unanimously VOTED to authorize the payment of $50.69 to the West Gulf Division Director, and $285.23 to the Canadian Division Director, for unreimbursed expenses incurred in the administrative affairs during 1964 over the originally authorized amounts.



W3YA, W3ECP and W7OCX

45) The Chair announced the opening of nominations for appointment of additional members to the Executive Committee. Mr. Smith nominated Mr. Eaton; Mr. Spencer nominated Mr. Best; Mr. Anderson nominated Mr. Denniston; Mr. Dannals nominated Mr. Compton; Mr. Shepherd nominated Mr. Engwicht; Mr. Cartwright nominated Mr. Anderson. On motion of Mr. Smith, unanimously VOTED that the nominations are closed. The Chair appointed Messrs. Bolvin and Cassen as Tellers. The Tellers announced the result of the balloting as follows:

Mr. Eaton.....	14	Mr. Compton..	11
Mr. Best.....	5	Mr. Engwicht..	5
Mr. Denniston...	15	Mr. Anderson..	14

Whereupon the Tellers declared Robert W. Denniston, P. Lanier Anderson, Jr., Noel B. Eaton and Charles G. Compton elected as members of the Executive Committee. (Applause)

46) The Chair announced the opening of nominations for the appointment of special members of the Executive Committee. Mr. Anderson nominated Mr. Houghton; Mr. Crossley nominated Mr. Handy. On motion of Mr. Chapman, unanimously VOTED that the nominations are closed. It was thereupon VOTED, 15 votes in favor to none opposed, that Francis E. Handy and David H. Houghton are declared elected as special members of the Executive Committee. Mr. Spencer wished to be recorded as abstaining.

47) At this point the Chair announced the following committee appointments for the coming year.

Finance Committee:	Mr. Anderson, Chairman
	Mr. Shepherd
	Mr. Chapman
Planning Committee:	Mr. Crossley, Chairman
	Mr. Thurston
	Mr. Eaton
	(Mr. Denniston, Alternate)
Membership & Publications Committee:	Mr. Best, Chairman
	Mr. Engwicht
	Mr. Spencer
Public Relations Committee:	Mr. Compton, Chairman
	Mr. Haller
	Mr. Dannals
	(Mr. Cartwright, Alternate)
Merit & Awards Committee:	Mr. Groves, Chairman
	Mr. Smith
	Mr. Moss

48) Moved, by Mr. Dannals, that the Board approve the increase of travel rate reimbursement for privately owned vehicles used on official League business from 8½ cents a mile to 10 cents a mile. After discussion, on motion of Mr. Compton, VOTED, 12 votes in favor to 4 opposed, to amend the motion to read 9 cents per mile. Whereupon the question being on the motion as amended, the same was unanimously ADOPTED. On motion of Mr. Thurston, unanimously VOTED that the increase in mileage reimbursement becomes effective July 1, 1965.

49) Mr. Denniston moved the adoption of the following resolution:

> WHEREAS, Project Oscar, Inc., has conceived, constructed and recently orbited an internationally successful 2-meter translator, its third amateur radio satellite, for use of the amateur service throughout the world in furtherance of its aim of extending the art and science of amateur radio in space communications,

W9PRN, W5LDH, and W2TUK

> NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the American Radio Relay League, assembled in annual meeting, does hereby extend to Project Oscar, Inc., the Board's heartiest congratulations for its Oscar III achievement, and assures the continued interest and support of the ARRL in the amateur space communications effort, and directs that a copy of this resolution be presented to Project Oscar with the Technical Merit Award.

Whereupon the resolution was ADOPTED, unanimously except for Messrs. Engwicht and Shepherd, who, while expressing their gratitude, felt it in order to abstain because of their membership on the Board of Directors of Project Oscar.

50) On motion of Mr. Denniston, unanimously VOTED that, after the Federal Communications Commission has made final disposition of Docket 15928, the Communications Manager is requested to make a study of the advisability of moving the National Calling and Emergency frequencies to integral 100-kc. points.

51) On motion of Mr. Chapman, unanimously VOTED to take from the table Mr. Crossley's motion relating to the amendment of paragraph 4 of the Rules and Regulations governing ARRL conventions. Whereupon, after discussion, the original motion was unanimously ADOPTED and the rule amended. During the course of this matter, Messrs. Spencer and Cassen, under the necessity of returning to their homes, departed the meeting at 10:38 A.M.

52) On motion of Mr. Chapman, unanimously VOTED that the Board grants approval to the holding of an ARRL National Convention on April 22-24, 1966, in the City of Boston, Massachusetts.

53) Moved, by Mr. Chapman, that the Board go on record as favoring the establishing of official visiting hours and the programming of an organized guided tour of the ARRL Headquarters Office, Laboratory, Antique Library and W1AW, this program to include the scheduling of tours at fixed hours during weekdays and in addition on weekends in the summer months. After discussion, on motion of Mr. Smith, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: "That the Headquarters staff is commended for and requested to

W4LVV and W7PGY

continue its welcoming of visitors to and tours of the Headquarters offices and W1AW." Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

54) Moved, by Mr. Chapman, that the Board go on record as favoring additional support of affiliated clubs by having League management work closer with the clubs in such a manner as maintaining a roster of available speakers for club programs, listing of clubs scheduled activities, etc., and perhaps the publishing of a monthly club bulletin by the Communications Department. After discussion, moved, by Mr. Shepherd, to amend the motion by striking the text and substituting therefor the following: "That the Board commends League policy of publishing hamfest notices in *QST* and expresses a desire that such activity be expanded as far as practicable both in *QST* and Communications Department publications." But there was no second, so the motion to amend was lost. After further discussion, on motion of Mr. Smith, unanimously VOTED that the matter is laid on the table.

55) At this point the Chair announced that the Roanoke Division had just achieved its quota in the Building Fund drive, and expressed appreciation on behalf of the Board to Director Anderson. (Applause)

56) On motion of Mr. Anderson, after discussion, unanimously VOTED that the Planning Committee continue to study the problem of divisional geographical limits and membership proportion therein.

57) On motion of Mr. Anderson, after discussion, unanimously VOTED that the Board establish a policy of reimbursing National Traffic System officials above the section level for certain approved travel in furthering ARRL organizational activities, and that the General Manager is hereby authorized to pay during the year 1965 a total amount not to exceed $6000 under terms prescribed by the Communications Manager following the general pattern established by the Board for reimbursement of SCMs, SECs, and QSL managers.

58) On motion of Mr. Anderson, unanimously VOTED that the Planning Committee is requested to study the feasibility of adding ARRL member participants to the Contest Committee.

59) On motion of Mr. Smith, after discussion, unanimously VOTED that the General Counsel is requested to study the matter of absentee ballots for amateurs temporarily residing outside of the division of their permanent residence, and report to the Executive Committee.

60) On motion of Mr. Smith, unanimously VOTED to take from the table Mr. Chapman's motion on assistance to affiliated clubs. On motion of Mr. Shepherd, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: "That the General Manager is requested to study ways and means of increasing services to affiliated clubs, particularly with respect to coordination of activities, program materials and similar matters." Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

61) On motion of Mr. Smith, unanimously VOTED to take from the table Mr. Moss' motion concerning the mailing of ballots by first-class mail. Mr. Moss, in view of earlier action taken on ballot procedures, and with unanimous consent, withdrew the motion.

62) On motion of Mr. Eaton, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1965, but not to exceed amounts as follows:

Planning Committee	$2000
Finance Committee	1000
Membership & Publications Committee	1000
Merit & Awards Committee	400
Public Relations Committee	1000

63) On motion of Mr. Cartwright, unanimously VOTED that to continue the Board's policy of reimbursing Section Communications Managers and QSL Managers of the League for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1965 a total amount not to exceed $12,500 under terms prescribed by the Communications Manager following the general pattern established by the Board.

64) On motion of Mr. Denniston, unanimously VOTED that to continue the Board's policy of reimbursing Section Emergency Coordinators for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1965 a total amount not to exceed $9500 under terms prescribed by the Communications Manager following the general pattern established by the Board.

65) On motion of Mr. Best, after discussion, the following resolution was unanimously ADOPTED.

WHEREAS, in the 74 sections of the League's field organization only about half the sections show the expected status and progress in public service and emergency communications through

VE3CJ, VE3RX and W4HYW

the reports of the Section Emergency Coordinators, and WHEREAS, the responsibility for such reports is among the duties of each SCM office,

NOW, THEREFORE, BE IT RESOLVED, that to achieve the proper filing of all such reports and assist to the end that our Public Service Corps may obtain its full capacity, the Communications Manager is directed to place emphasis on the filings of satisfactory reports by the Section Emergency Coordinator, or the Section Communications Manager responsible, and report to the Board at its next meeting so that the suitability of present travel reimbursement provisions for SCMs and SECs might be considered by the Board in the light of a further year's experience.

66) On motion of Mr. Compton, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1966 and the 1966 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amounts than 1965 authorized amounts.

67) At this point the General Manager reported receipt of a request from the Department of Army, OCD, to bid on a project involving an extensive study of the Radio Amateur Civil Emergency Service. After extended discussion, on motion of Mr. Compton, unanimously VOTED that the General Manager is encouraged to continue staff efforts to advance and improve the Radio Amateur Civil Emergency Service, and authorized to take any steps necessary to this end.

68) At this point, Messrs. Denniston and Eaton reported to the Board on the results of the meeting of the Executive Committee of the Inter-American Union of Radio Amateurs, the Region II Division of IARU, recently held in Lima, Peru.

69) On motion of Mr. Moss, unanimously VOTED that the Board extends its appreciation to the Field Engineering Bureau and the Amateur and Citizens Radio Division of the Federal Communications Commission, and to the Telecommunications Division of the Department of Transport, for their continuing assistance and cooperation in administering affairs of the amateur body during the past year.

70) On motion of Mr. Best, unanimously VOTED that the Board extends its sincere appreciation to the many League members and clubs who have so generously contributed to the Building Fund, and that the Board requests continued support of this project until the goal has been reached.

71) On motion of Mr. Eaton, unanimously RESOLVED that, on the occasion of the 100th anniversary of the founding of the international regulatory agency now known as the International Telecommunications Union, the Board transmits its sincere congratulations to the Union, its commendation for many achievements in the development of telecommunications progress, and extends its hearty good wishes for the coming years.

72) On motion of Mr. Haller, after discussion, unanimously VOTED that the Federal Communications Commission is requested to re-examine the licensing and operator privileges of club stations.

73) On motion of Mr. Anderson, the following resolution was unanimously ADOPTED (by a rising vote with applause):

WHEREAS, David H. Houghton has served the American Radio Relay League faithfully and well as Circulation Manager for nearly 44 years; and WHEREAS, he has been throughout that time an example of integrity and devotion to duty and thereby has contributed much to the growth and stature of the League; and WHEREAS, he is to retire from the League staff in 1965; and WHEREAS, he has served for almost 25 years in the additional honorary post of Treasurer, in which office he continues to make available to the League his wise council and long experience,

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the American Radio Relay League, Inc., in annual meeting assembled, do hereby express to:

DAVID H. HOUGHTON

their deep appreciation of his long and diligent service to the League and its membership.

74) On motion of Mr. Groves, the following resolution was unanimously ADOPTED by acclamation:

WHEREAS, at the suggestion and invitation of Vice President Reid, VE2BE, this annual meeting of the Board of Directors is being held for the first time in our history outside the continental United States, at the City of Quebec, Canada, and, WHEREAS, Radio Amateur de Quebec, Inc., and Radio Club de Quebec, have graciously served as hosts for this 1965 annual meeting of the Board, and, WHEREAS, we were made most welcome by our hosts and through them by the Honorable Jean Lesage, Prime Minister of the Province of Quebec, and by His Worship, Mayor Wilfrid Hamel, of the City of Quebec,

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors in annual meeting assembled this 22nd day of May, 1965, that an expression of sincere thanks and appreciation be extended to our hosts for the gracious hospitality which contributed so much to our enjoyment of this visit.

Mr. Reid spoke in appreciation, but stated that most of the credit for the arrangements was due Vice Director Dumbrille, in which Mr. Eaton agreed; whereupon a rising vote of thanks was given Mr. Dumbrille.

75) Whereupon, on motion of Mr. Shepherd, the Board adjourned *sine die* at 1:12 P.M.

76) (Time in session, 7 hours 38 minutes; total authorizations, $64,185.92.)

JOHN HUNTOON
Secretary

OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members, in a volume which also includes reports of the directors. The cost price is 75 cents per copy, postpaid. A copy of the financial statement only is available without charge. Address the General Manager at Newington, Conn.

I.A.R.U. News

AMATEUR TELETYPE

Due to the increasing availability of surplus equipment RTTY has become more and more popular in Region 1, especially in Europe. A survey by Region 1 Division of the Union came up with some most interesting information, subsequently reported in the Region 1 Bulletin which may be helpful to other areas investigating RTTY possibilities.

Italy

A.R.I. reports that about 50 RTTY stations are active at present, with about 150 expected to be active by the end of 1965. Olivetti T2 teleprinters are in general use but the Postal authorities are expected to release about 600 old type machines soon. Special licenses are not required and interest in this mode is, in fact, encouraged. Radio teletype is expected to be used extensively in the Italian Amateur Radio Emergency Network.

Germany

D.A.R.C. reports about 100 RTTY stations active in Germany with various machines including: Hell, Siemens, Standard Electric, Lorenz and, occasionally, Olivetti. A special permit is necessary and valid for one year at a time. RTTY may be used only between 3575–3625, 3725–3775, 7025–7050, 14075–14110, 21075–21125, 28100–28150 Kc., and 145.8–145.9 Mc. The only types of transmission permitted are Hell and C.C.I. T.T. code 2. Keying — particularly with A1 — must be soft. With F1 operation the frequency deviation must not exceed 450 c/s (shift 900 c/s). The call sign of the home station and of the station being worked must be transmitted every ten minutes.

VK5FH, one of our active friends from "down under," was a visitor to the headquarters in April. Fred used to be OE1FH, back in 1938.

Flash: Just at press-time comes word of a reciprocal operating agreement between the U. S. and Portugal.

During March ARRL/IARU headquarters had the pleasure of a visit by Osmo Wiio, OH2TK, president of the Finnish amateur radio society. He spent a day with us, discussing various aspects of international amateur radio, and above we see him (r.) with ARRL General Manager and IARU Secretary John Huntoon, W1LVQ.

Denmark

E.D.R. reports about 20 RTTY stations active with much new interest. Creed 7B machines and Siemens perforators are favored by availability. No special license is required.

Austria

Oe. V.S.V. reports six RTTY stations active with Creed and Olivetti machines available. No special license is required where permission has already been granted to use A2 and F2.

France

R.E.F. reports 6 active stations with a number of interested listeners. Creed 7B machines are available. No special license is necessary provided the PTT is informed of the station's intention to use the mode. International Code 2, 50 Bauds, with a tolerance of 0.75% is the only one in use.

United Kingdom

The R.S.G.B. reports just under 200 active teletypers with most activity divided between 3.5 and 144 Mc., and a few on other bands.

Creed 3N. 44 perforators and 7B printers are the most available machines. No special license is required but operation is restricted to the No. 2 International Code. Contacts must be signed off in plain language or Morse code and speeds allowed are 50 or 45 Bauds. Most U.K. machines have two-speed governors which permit their operators to switch between the two speeds.

Sweden

S.S.A. reports three RTTY stations with several others building K6IBE terminal units in anticipation of securing surplus machines. One model 15 and two Creed 7B's are in use. Swedish amateurs may use the mode in any band 3.5-28 Mc. S.S.A. recommends 45 Baud operation in accordance with C.C.I.T.T.

Switzerland

U.S.K.A. reports four stations equipped to operate RTTY, using either the Lorenz or the Siemens machines. Special licenses are required which may be secured upon successful completion of a test which includes sending 600 words in five minutes with no more than five errors.

The Netherlands

V.E.R.O.N. reports 10 active teletypers most of whom are active on 145.8 Mc. The society believes that the v.h.f. bands are the appropriate areas for this mode and encourages its usage there. No special license is required but a maximum of 900 c/s deviation is permitted.

With all of this interest RTTY is expected to come in for its full share of consideration at the upcoming Region I Executive Committee meeting scheduled for July 10-11 at the Hotel Kvarner in Opatija, Yugoslavia. One important point sure to be discussed is the Baud rate. European machines vary from 45 to 50 Bauds while U. S. machines operate mostly at the 45 rate. The R.S.G.B. is pressing for a 50 Baud standard. If the British view prevails, more than 5000 U. S. and Canadian machines will have to be changed in order to work the Europeans.

A recent visitor to ARRL/IARU Hq. was the General Secretary of the Portuguese amateur society, CT1JJ. He was in this country on a six-week study of U. S. banking procedures, and had an opportunity to visit many of the friends he has made on 14-Mc. phone. On his visit to ARRL we were able to discuss many matters of common interest concerning international amateur radio.

BI-LINGUAL INSTRUCTIONS

The U.S.K.A. has produced an excellent 36 page introduction to amateur radio written in both French and German. The book is illustrated and answers a good many pertinent questions for would-be radio amateurs in Europe. It is available for 2 IRC from the Union Schweizerischer Kurzwellen-Amateure, Sekretariate, 6233 Buron (LU) Switzerland. Ask for '*Was ist Amateur-Radio.*'

(Continued on page 162)

DX OPERATING NOTES

United States Reciprocal Operating Agreements currently exist *only* with: Canada, Costa Rica, Dominican Republic, Ecuador, Portugal and Bolivia. Several other foreign countries grant FCC licensees amateur radio operating privileges on a courtesy basis; write headquarters for details.

Third-Party Restrictions

Messages and other communications — and then only if not important enough to justify use of the regular international communications facilities — may be handled by **U.S.** radio amateurs on behalf of third parties *only* with amateurs in the following countries: Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru, and Venezuela. **Canadian** radio amateurs may handle these relatively unimportant third-party messages with amateurs in Bolivia, Chile, Costa Rica, El Salvador, Honduras, Mexico, Peru, U.S., and Venezuela.

DX Restrictions

United States amateur licensees are warned that international communications are limited by the following notifications of foreign countries made to the International Telecommunications Union under the provisions in Article 41 of the Geneva (1959) conference.

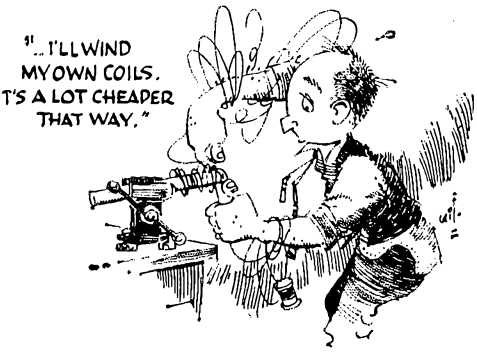
Cambodia, Indonesia (including West New Guinea), Thailand and Viet Nam forbid radio communication between their amateur stations and amateur stations in other countries. **Canadian** amateurs may not communicate with Cambodia, Indonesia, Laos, Thailand, Viet Nam and Jordan.

When I Get My Mind Made Up

BY VICTOR MAYEV,* K9TON

ALTHOUGH I was a very devout a.m. man, I finally became aware of the fact that the sideband boys may have a good thing. Not that s.s.b. is any better than a.m. in any way, but a small experimental sideband rig might not cost too much to build, and I would see how the boys on the other side of the fence are doing.

At first, I decided to build the S.S.B., Jr. using a commercial audio phase-shift network. This unit wouldn't cost much and it would really be a neat rig. But the idea of being limited to one band didn't quite appeal to me. Suppose I didn't



like the band I was on; then what? Build a new exciter? That was out of the question. It would simply cost too much. So I started to explore the prospect of building a multiband rig from one of the articles in *QST*. In fact, I could even design the exciter myself. It would be so simple to design a rig that generates a signal on 9 Mc. and then heterodynes it to all of the ham bands. I would only have to add two more tubes to a 9-Mc. exciter: an oscillator and a mixer. I could even combine the two and use a 6U8 as oscillator mixer. That wouldn't cost very much at all. But could I cover 80 through 10 meters with just one mixer and an oscillator? I guess everyone else uses two mixers. That would mean a crystal controlled oscillator. Crystals aren't too expensive anyway. But what could I use for a v.f.o.? Can't use a BC-458. They're too expensive. I'll wind my own coils. It's a lot cheaper that way. They say that s.s.b. equipment has to be stable. Oh well, the guys will never know the difference. Now how about the final? I really don't have any tubes that are linear except a 6AG7. But who wants to run 5 watts? Say, that ham down the road said he had a couple of 807's. Maybe I could trade one of my modulation transformers for . . . no, come to think of it, he works sideband, doesn't he? Well an 807 can only run 75 watts input anyway. Wonder what the guys will think of me running 75 watts input to a bubble-gum machine when I usually run a kilowatt a.m.? Say, this surplus ad says that they have 813s for $12. With a pair, I can run a full kilowatt input for only $24. That's not bad at all. Well, that's it for the rig itself. But some of the guys I talk to say that the main pleasure in operating sideband is the use of VOX break-in. Why, with only two 12AU7s, I could build a first class VOX. I don't really need an anti-trip circuit. Never run the volume up that high. But still, considering the programs I sometimes listen to, it might be embarrassing if they got on the ham bands through my transmitter. Well, I'll only have to add a 6AL5 and I'll have anti-trip protection. Looks like that's the whole rig. And according to my calculations, it will only cost $135. But for only $50 more, I can buy a Manyphase exciter kit. Of course, I'll have to design my own linear . . .

And that is the way my reasoning went. I finally took the big step and bought a Crawlins SWK-10 all-band 2-kw. transmitter for only $3753.26 (it was on sale). Then I bought a Goosenet QRY-1 super deluxe receiver that features six conversions, four audio stages, three r.f. stages, and a total of sixteen i.f. stages. All this for only $2734.00! I won't be able to rent a room until I get all of this paid for but shelter isn't a problem. I live in the Crawlins SWK-10. As soon as I get all this equipment paid for, I think I'll try building a simple 2-meter converter, just to see how the band sounds. QST

* 628 Pierce Court, Grayslake, Ill.

OUR COVER

A final reminder — the 1965 ARRL National Convention gets underway Friday, July 2, in San Jose, California. There'll be plenty of technical talks, displays, sightseeing tours, a barbecue, contests, a golf tournament and a great many other activities during the four-day convention period, July 2 through 5. For details, see May and June QST, or write ARCs, P.O. Box 6, San Jose, California 95103.

NEXT MONTH

The popular series on RTTY by Irvin Hoff, K8DKC, begun in January *QST*, is interrupted this month to allow needed time for putting the finishing touches on the next article. This seventh article will be, in a very real sense, the high spot of the entire series — a complete description of the Mainline TT/L f.s.k. demodulator, using the most advanced detection techniques and incorporating new last-minute features never before published. No RTTY devotee can afford to miss it.

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

DOCKET 15928

¶ Congratulations on your success in obtaining an FCC proposal to revise amateur licensing and incentive proposals. Put me on record as agreeing that the FCC Docket #15928 even exceeds in quality your suggested basic proposals.

As an amateur of over 25 years, it has always been my opinion that any higher class license should include stiffer c.w. requirements as well as technical ones. I believe that the greatest justification of the amateur in the eyes of the government is not emergency communications, however useful this may be, but that in wartime the amateur fraternity furnishes thousands of ready-trained c.w. operators for the armed services. — *W4KLD*

¶ The new proposals smell! How can you people be so asinine as to create restrictions on c.w. bands? This is utter idiocy. Phone restrictions, yes, but no c.w. restrictions. Also, what a fraud! I had to take an exam for old Class "A". It did not pay off.

I operate 5% phone and 95% c.w.! My license was issued April 1935. Come on! Let's be real and fair — think. — *W2IIIE*

¶ I am in complete agreement with your Docket of Proposed Rule Making No. 15928. Obviously a great deal of thought went into the preparation of this proposal to upgrade the Amateur Radio Service, and I'm certain that the proposal as it stands will accomplish this end in an admirable fashion. It provides incentive to advance, without, at the same time, making any ham's equipment or favorite modes of operation obsolete.

I have held an Amateur Extra Class license for the past nine years, partly in hopes of extra privileges "someday," but mostly because it was "there" and because it was a challenge. I had to learn a lot of electronics at the tender age of 17 to pass the examination, but in the process of learning and understanding radio I came to appreciate it a great deal more than I had previously. As a mathematician and computer programmer, I am certainly not a "professional" in the electronics field, but the knowledge gained in attaining my Extra Class license was sufficient to allow me to design and build most of my own equipment, to feel comfortable about it, and enjoy it much more than buying it and plugging it in. Admittedly, many of the things I build don't work the first time, but rather than toss it out when it doesn't work, I have the background to find out why it doesn't work and then to make it work — learning still a bit more in the process.

There are probably many people in amateur radio who regard it only as a medium for their own personal communications and could care less for its technical aspects. The proposal as it stands will still allow these people to operate. This is as it should be — communicators are important. But, I'm certain that with the new incentive licensing system, far more amateurs will find that electronics is interesting and that amateur radio is more than talking into a microphone and throwing the appropriate switch.

Though there will undoubtedly be much carping over the proposal, I'm sure that most will praise you, FCC and amateur radio will be much the better for it. — *K6TZX*

¶ In disregarding past recommendations of the ARRL, the FCC has followed a vacillating course which has been highly damaging. In this time of crisis we should study our past, analyze the present and plan for the future.

The current problems of amateur radio have great range and depth. The proposed ways and means are not on target. The downgrading and banishment of the tried and true advanced class to accommodate the super superlative licensing structure is wrong. — *W0CSZ*

¶ Gee whiz, fellows, I'm all for an incentive program.

That's why, after holding a Class B license for a long time, I had an incentive to get a class A (Advanced) — so I could have more operating privileges.

So I earned my Advanced.

Is it logical to take the privileges of Advanced Class operators and give them to the Generals after requiring us to take a further exam?

And not only that — we lose our status as Advanced and get put back to General!

What do you mean incentive? What goes? — *W8CSL*

¶ I do not feel that imposition of upgrading licenses by giving the Extra Class should prove too harsh a test on a person interested in improving himself and the amateur service. The extent of my formal education was to finish grade school in 1917, and by diligent study, I was able to obtain not only the Extra Class license, but also the ARRL Certificate for having copied code at the rate of 35 words per minute. — *W5JA*

¶ The nearly complete reliance on commercial equipment has contributed greatly to the decline of amateur abilities. In the not too distant past it was necessary for the amateur to construct, and thus understand, much of the equipment that he used. A return, if only partial, to this system would contribute a great deal to the sagging technical competence. It would provide the "doing" to go with the "reading".

In view of the above, the following requirement is hereby proposed:

"It shall be required that a radio amateur use a transmitter of his own construction for his first year of operation. The aforementioned transmitter shall not be of kit-type construction,

but be built up from the individual component parts."

A rule such as this would insure that the new ham would undertake at least one construction project early in his amateur career. The incentive generated would go a long way toward influencing him to undertake similar future projects, and to read more, to understand more, to round out, and fill out, his technical abilities. The incentive would thus be directed toward the desired technical escalation. — *W9MVM*

¶ While we fully support ARRL and this docket as now written, if any further changes were to be made I would suggest making it possible to hold the same amateur call signs "for life" regardless of subsequent geographical moves by the individual. This could be done by considering the suffix numeral indicating area of present operation as normal and by not requiring modification of license to a new (and frequently temporary) home location. — *W6CIW*

¶ I think the FCC has a good point in making the different classes of license to each have a distinctive call sign. This makes for better policing and easier monitoring, but, I also think it would be good if a "ham" could keep the call that he has perhaps held for many years. These two points are obviously in conflict so it leaves the door open for possible compromise. My suggestion would be that the prefixes be assigned in large enough blocks so that a license could at least carry the suffix of his call along with him throughout his "ham" career. A novice who started out as WV would progress through WO, WL, WF, WA; one who started as a WX would go up through WS, WN, WH, WC, etc. By using K as a second starting letter, it would open a second series of blocks. The present holders of two letter calls could be allowed to retain them and the single prefix "W" type of call could be reserved for "special" calls such as clubs, short term licenses, such as fairs, hamfests, etc. — *W2NYH*

¶ Amateur radio is a fascinating hobby which many Americans enjoy. It took me three years to acquire my General license. I had to go to Boston from Providence at least 15 times to pass the General test.

Now the ARRL and a certain group would like to eliminate the great majority of hams because they find the frequencies crowded. They would like special privileges.

This group and ARRL are really professionals. They work at radio and most are actively engaged in radio business, or they are the younger people who go to schools and are now studying electronics.

There are many men of 50 years and over who had to study two to three years to get their licenses. Now, only because of the selfishness of the professional hams, we are going to lose our hobby. — *K1AJC*

¶ I feel that the proposed schedule of calls will turn any present organized amateur activity (nets, etc.) into chaos, at least for a while. I question the simplification of the monitoring chore — as amateurs take up little of the FCC's overall monitoring time. Secondly, anyone who seriously plans to operate out of band would simply bootleg the appropriate prefix or call. The penalties provided for out of band operation should be sufficient to keep all but the very few in line. If there is to be a scheme wherein the call identified the class of licensee, it would be arranged such that a given operator retains his existing suffix while rising through the ranks, having only the prefix changed. Groups of second letters in the prefix could be assigned to each class. It would then be possible to identify what old call the new one corresponded to, at least in many cases. — *K1KKP*

¶ In reference to the FCC proposal for incentive licensing, I favor the idea in general, but object to the fact that the c.w. man must go up two grades to get all his old operating privileges back, whereas the phone man must go up only one grade to regain his old status. This seems unfair, and illogical, especially in view of the fact that the c.w. man is keeping up a special skill and taking up less bandwidth than his phone buddy. — *W.14WBM*

¶ I am very much opposed to this business of incentive amateur licensing. Your organization is supposed to represent the radio amateur, yet it seems to me that a few warped idiots are running the whole organization. I have been licensed for 10 months. I worked very hard to get my General ticket. Now you idiots are trying to ruin the bands. From what I have heard on all the ham bands, I am not the only ham who is opposed to your "pollicy." I was going to join the League, but now I want no part of this funny farm. All you seem to do is agitate hard feelings. — *W.11CPC*

¶ Keep up the good work and don't let these loud-mouthed blowhards sway you from your, this far, good policy stand: i.e., incentive licensing. Specifically, it is going to be hard to beat the proposal made by the FCC. It will be effective; yet is most painless. I'm for it! Let's push for it! Let's save amateur radio. I'm pleased to renew my membership for another year. — *W9IILQ*

¶ It is human nature to resist change which will result in a disruption of the status quo. However, it appears certain that some change is going to be made in our testing levels and it would behoove us to accept that proposal which would create the least disruption for all.

This Docket 15928 appears to be the most equitable yet presented. — *W7EMU*

¶ Incentive licensing is a necessity and the proposals contained in Docket No. 15928 appear to be thorough, comprehensive and generally satisfactory. However, we are all aware of the fact that amateur radio is only one of a multitude of radio services administered by the FCC and that it is desirable to adopt the least elaborate licensing program possible so that the usefulness of this service will not be outweighed by its being an excessive administrative burden to the FCC. — *K4YDE*

¶ Re incentive licensing — personally, I'm not unwilling to study for a higher level technical examination, but I don't like to think of practicing code to bring my speed up to 16 w.p.m. — *W7SCU*

¶ Since the proposed code speed of 16 w.p.m. is very close to the arithmetical mean, 16.5, and the geometrical mean, 16.12452, of the code speeds for the General Class and the Amateur Extra Class, I feel that it is all right for the Amateur First Class.

The only thing that I urge, is that the proposed call letter assignment should be weighed and different schemes be considered. — *K9QVC*

¶ I am in favor of incentive licensing for the amateur service.

The proposed regulations described in *QST* are somewhat extreme, and I think some details will have to be negotiated, but the basic philosophy of a strong incentive system is good and proper. I believe amateur radio has suffered somewhat over the past several years by the lack of such incentive for the individual amateur to better himself.

I hold an Advanced Class license (based on an older Class A) and realize that I will lose privileges under the new regulations; nevertheless, I endorse the proposed new regulations as sound, and hope they are adopted in essentially the form proposed — *W2OWO*

¶ I have been licensed since 1951 and in the past ten years my logs show I have used two of the reserved band segments, a total of about a dozen times. While this does not necessarily mean that I, or others in similar circumstances, would not obtain an Advanced license, I feel that the incentive is not sufficient to encourage such advancement. — *W1WFL*

¶ Holders of Radiotelegraph First and Second Class, and Radiotelephone First Class licenses have passed a comprehensive examination in both theory and code. They are qualified to operate commercial and government electronic equipment, and therefore should have the necessary knowledge and skill to operate a First Class or Extra Class amateur radio station.

It is proposed that as an added incentive for amateur operators to raise their licenses status and privileges that the Federal Communications Commission recognizes a holder of a Radiotelegraph First or Second Class license and/or Radiotelephone First Class license as qualifying for either the Amateur First Class and/or Amateur Extra Class licenses. — *W2APR*

¶ To date the only favorable part of these proposals appear to me to be the extension of the Novice ticket to two years. This is good and I am for it for numerous reasons. In short it encourages the young fellows in the hobby and gives them more time to obtain either a General or Technician ticket.

To me the balance of the program does not appear to be for the majority but, for a few. Why should anything in amateur radio be for the few. It is a hobby and should be regarded as such. To take parts of the existing bands from the General and Technician and give these parts to a new class (for a few) is by no means democratic. How this can be justified I do not know and hope that these factors be looked into further. — *W15GVV*

¶ The FCC deserves praise for including in its proposals a prohibition of Novice phone. This is certainly consistent with its policy of upgrading amateur radio. However, it is disturbing that the Commission would double the term of the Novice license to two years. The only incentive incoming Novices would then have would be to sit tight for a year and a half, then buckle down for a few months to pass the General. The "why study, I still got another year?" attitude would be only too evident. Surely a year, even six months, is enough time in which to increase your code speed by 8 w.p.m. Why should Novices glut frequency space even more desperately needed than before? Why should we put up with it? — *W19PEF*

THE AMATEUR IS FRIENDLY

¶ The two acid letters appearing in the May issue of *QST* which expressed the disgust of two hams at the possibility of CBers becoming amateurs (however legally) has prompted me to write my first "letter to the editor." I presently hold valid Novice and Technician licenses, am a female, and was first interested in hamming four years ago by W8EWP (then K3BWI) who was then helping my husband get his license. Recently, with the help of the OM (WB6BTE) and W6YOB at Santa Monica City College, my licenses were obtained. Only the advent of a brand new boy harmonic has interrupted the 13 w.m.p. code study towards that General ticket.

Since first becoming interested in ham radio, I was never rebuffed, never ridiculed, and never refused help in studying this fascinating hobby. The letters from WB2CNB and WB6ARP cannot be from the same kind of sincere amateurs who have helped me. To refuse anyone the opportunity to become a radio amateur is contrariwise to the very spirit of the amateur's code. To even suggest trying to put a quota on the number of hams allowed to hold a license (per WB2CNB) brings to mind words that are not printable. I wonder if he is also against women in the amateur ranks.

The attitude reflected by these gentlemen (really?) is one that could ruin amateur radio. After all, no one suggested that we turn over the frequencies to a bunch of kids, but rather it was just recommended that we hams help the CBers who are interested to legally procur the same kind of licenses through the same kind of tests we have now. True, there is an equally antagonistic attitude among CBers toward hams, but I feel that too many of us are to blame for that by acting "holier than thou" just because we have passed a code and theory test. If I had met this kind of opposition while trying to learn electronics theory, it would certainly have left me feeling most antagonistic toward hams. What kind of selfish attitude is it to refuse someone the enjoyment of this hobby by knocking his efforts to learn about it? The OM and I are now encouraging two more neophytes to join the ham fraternity.

CB has its place and, to be sure, hamming is not its place. Nevertheless, if a CBer sincerely wants to become an amateur, let's encourage him along the proper guidelines. Don't revile him with such malevolent attitudes as represented by these and other envenomed writers. Who knows? Perhaps with a little help and tolerance, amateurs will come through (as in other times of the past) and help the CBers clean up the present mess that Citizens Radio is in. It would certainly mean powerful public relations if both fraternities stopped this ridiculous animosity towards each other and banded together to inform the public of what we are capable of doing in harmony. — *WB6NOE*

THE SCHIZOID "WE"

¶ This letter is inspired by a very embarrassing explanation which I recently had to give to a listener who asked me why, in better than two hours of QSO's that all the operators had invariably referred to themselves in the first person plural. After

assuring him that as a rule it didn't take more than one person to operate the t.r. switch, and that as a rule amateur operators are not subject to split personalities, I proceeded to give a rather weak explanation of the situation.

Why this use of "we?" I offer two explanations. The first is that it is picked up as a matter of habit from the "old timers" who use it on the bands. The new operator can come to believe that any referral to himself alone is against the etiquette of hamdom. The second reason is that it is a cover for a lack of self-confidence. If an operator is unsure of himself on the bands, if he faces a lack of intelligent conversation beyond the profound "By-Golly," then it seems natural to hide behind the impersonal and ambiguous "we." By using the we, he subconsciously feels that no charge can be pinned on him — whether it be poor operating procedure, inane conversation or poor grammar.

What to do about the "we?" Because it is only a reflexion of deeper problems I say; fellow amateurs, project yourselves! Practice good operating procedure and have confidence in your skill. Kill the senseless QSO and leave the space in the ether given to us for conversations befitting the purpose of the amateur airways. If this is done, then each and every operator can claim his signal and intelligent modulation with a very proud and resounding "I"! — *W15GOW*

SAY IT WITH WORDS

¶ I was very impressed with the June 1940 article by K. B. Warner, "Say it with Words." I have faithfully followed the phone operating procedures described therein. In recent years I have the feeling that my use of "calling any amateur phone station" is looked upon with curiosity in some cases and open rebellion in other cases. I have received replies from amateurs wondering why I was using that expression rather than saying "calling CQ."

Last week after completing a contact with a WA0 I overheard him in conversation with another station. He thought I was some sort of a kook because I said "calling any amateur phone stations" and the crowning blow was when I said "goodbye" to him instead of saying "73."

In a way I am pleased that the younger amateurs are being so conscientious about operating procedures. However, I don't like to be thought of as a kook.

It is my recommendation that the article "Say it with Words" be repeated for the education of newer amateurs in using plain English while operating radio telephone stations. — *W2JKH*

HOT TOPIC

¶ I just thought I'd tell you guys how much I like reading about ideas and experiences as written in this column. But, I also want to make some noise about the way some of you like to grind up your fellow hams in this magazine, which has worldwide circulation. If you want something to squawk about, try sitting on your soldering iron and talking about that. — *WA2YZF*

AIRTIGHT CASE

¶ Yesterday the local Highway Patrol officer showed me the trunk of his 1965 Ford patrol car which had been wrecked by explosion and fire. The blast occurred when he was driving to his regular patrol station and tried to check in by radio.

Just what caused the blast is not certain. The radio was blown apart with great force. The top cover was blown off and slammed against the trunk lid so hard that the print of the cover was stamped in the metal. There were three holes punched in the trunk also. The inside of the trunk was blackened by the fire that followed.

Patrolman C. M. Metts stated that the blast came as he pushed the transmit button and the car filled with smoke before he could stop.

Gasoline fumes in the trunk, set off by the relay or other spark inside the radio, seem to be the explanation. Perhaps this letter will cause mobilers with equipment in the auto trunk to check on the "gasoline fumes" theory. It might prevent an accident or even save a life. — *K4DTT*

THANKS

¶ We appreciate your sending us the book of compiled information concerning the historical data of the past 50 years of ARRL. — *Ursuline High School A.R.C.*

July 1940

. . . The editorial this month discussed the threatening war situation in Europe and the position of U. S. radio amateurs working stations in Europe. It was recommended by the editor that no European amateurs be contacted until the conflagration subsided. About two thirds of the way through the editorial, the text suddenly was interrupted with a *FLASH!* On June 5, the FCC issued Order No. 72 which ordered all amateur radio amateurs to suspend "communications with operators or radio stations of any foreign government or located in any foreign country." The order was received just in time to make the June issue of *QST*.

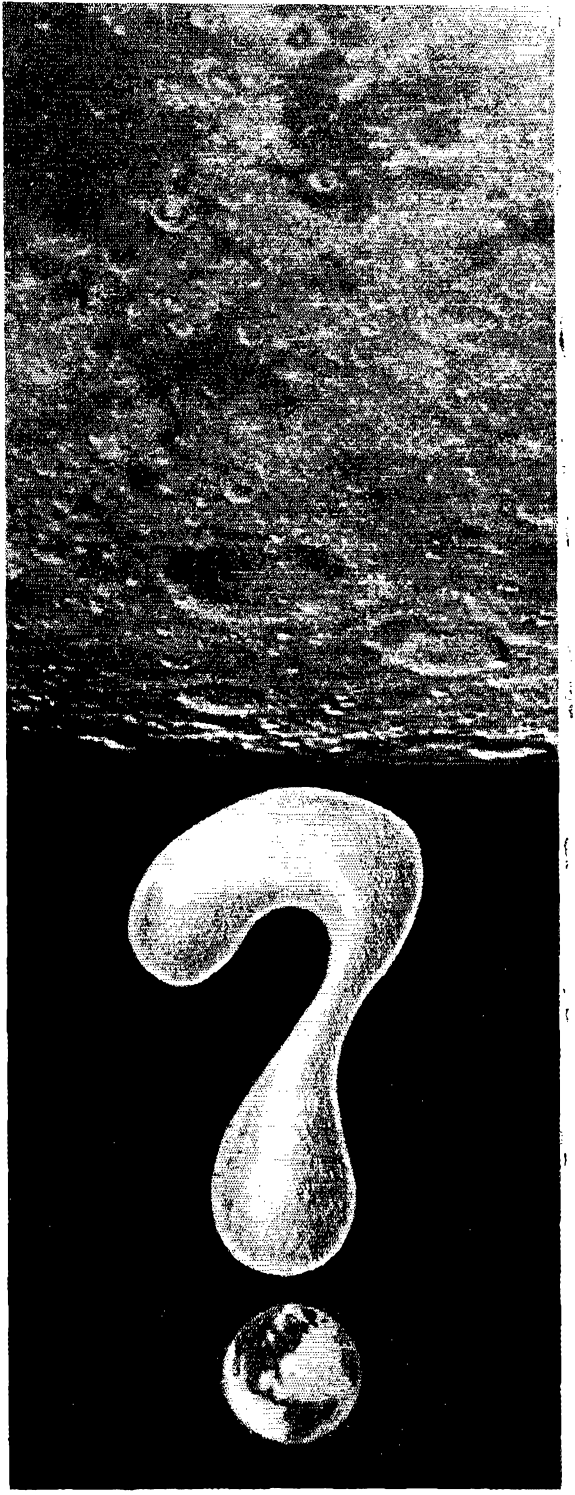
. . . Technical articles included a "Stabilized Variable-Frequency Oscillator" by G. M. Brown, W2CVV; "Counting Words Per Minute Electrically" by M. J. Larsen (the operator's sending speed was read out on a calibrated 0–1 ma. meter, with 40 w.p.m. full scale); "An Efficient U.H.F. Unit for the Amateur Television Transmitter" by L. C. Waller, W2BRO; "A Different Portable-Emergency Transmitter" by R. P. Austin, W3EVA; "A Heterodyne Exciter" by W. R. Bliss, W1FMZ and P. A. Rehm, W2HNY; and "A Portable Transmitter-Receiver" by L. M. Hildebrand, W6QUE.

. . . An article entitled, "Portable Kinks" by H. W. Dryer, W1ANC, contained a collection of useful suggestions, chiefly in connection with portable operation under conditions where good antennas cannot be secured.

. . . A new Transmitting Pentode, the 829, was announced in the "New Apparatus" column. QST—

How High the Moon

BY DON LUND,* WAØIQN



THE YEAR 1964 will long be remembered by v.h.f. moonbounce enthusiasts. First, the patient work of Bill Conkel, W6DNG, and Lenna Suominen, OH1NL, paid off with the first two-meter moonbounce contact, and then KP4BPZ really showed the possibilities of such work. Postmortems on the week end of June 13 and 14 were held wherever v.h.f. men gathered, but one aspect of our participation seems clear. Many groups and individuals depended upon their ability to visually align their antennas on the moon. Cloudy weather meant failure; partly cloudy weather meant disastrous breaks in tracking the moon.

Getting around this trouble is really pretty easy. First, you need to know where your antenna is pointed. If you're using good rotators, the indicators tell you. If you're using an "Armstrong" system, attaching "setting circles," which are circular dials with 360-degree markings, will tell you. Now the only thing you need to know is where in the heck the moon is!

The purpose of this article is to show two ways of calculating where the moon will be in the sky at a given time on a given date. The first way is quick and dirty. With no mathematics and no references other than this article, it will predict the moon's position to an accuracy of 5 degrees or so for observers within the United States. Since an antenna with an honest 20-db. gain will have a half-power beam width of about 13 degrees, 5-degree accuracy should be acceptable for most applications. If this isn't good enough, a second way is described. It is both accurate and tedious. To use it, one needs a table of trigonometric functions and one reference book. Either of these methods will help you aim your antenna at the moon in fair weather or foul.

All of this discussion will be in terms of elevation and azimuth coordinates. Elevation is the height in degrees of the center of the moon above the horizon. Azimuth is the bearing of the moon, measured clockwise from North. For example, the elevation of the horizon is 0 degrees, and the elevation of a point directly overhead is 90 degrees. The azimuth of the eastern horizon is 90 degrees, while the azimuth of the southern horizon is 180, and so on. We are going to stick to "az-el" coordinates because this is the simplest type of mounting for an amateur to build and align. Also, because of the moon's rapid motion in declination (declination is the same, in celestial coordinates, as latitude in geographical coordinates), other types of mountings do not offer the advantage for the moon that they do for heavenly bodies with fixed declinations.

The Moon's Position; Quick Way

If we watch the moon's path across the sky for a month or so, we see that it shows a cyclic variation. The moon might, on the first night, rise quite high in the sky. The next night it would not rise quite as high, and the next night it would be even lower. After about 13 days it would be lowest in the sky, and the next night it would be

* 430 S. 45th St., Boulder, Colorado.

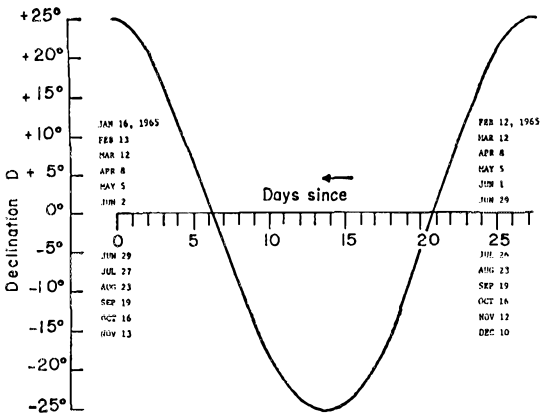


Fig. 1—The average declination of the moon during 1965.

higher again, until after about 27 days, it would be at its highest again. This is because the moon wobbles in declination. The wobble is almost sinusoidal, with a period of about 27 days, as shown in Fig. 1. The dates given are the starting dates for the oscillation. Since the period isn't exactly 27 days, it is necessary to slip a day every so often, as on September 18–19. The maximum amplitude changes about 1½ degrees during 1965, so the curve shows the mean declination, D, during 1965. Thus on July 26, 1965, the moon's declination is + 25 degrees. On August 2, seven days later, the declination is 0, while on August 3, D = − 4 degrees.

Knowing the moon's declination, we may compute its path across the sky (see Fig. 2). We see that when the moon's declination is most positive, it passes highest in the sky; when the declination is most negative, it is lowest in the sky. At some time, call it T, the moon is due South. At $T - 1$, that is one hour before T, the moon is on a solid line corresponding to the declination from Fig. 1, where it crosses the dashed line marked "$T - 1$." An hour and a half later, the moon is still on the same solid line, and is where the dashed line marked "$T + 1\frac{1}{2}$" crosses it. At $T - 1$ and $T + 1\frac{1}{2}$, we can read the moon's azimuth and elevation off the bottom and side scales. One word of caution about Fig. 2: It has been computed for an observer whose latitude is 40 degrees North, which is on a line passing through San Francisco, Indianapolis and Philadelphia. For observers north and south of this line, the elevation scale is squeezed or stretched. However, for the kind of accuracy we need, the curves will produce acceptable results over most of the continental United States, except Texas, Florida and Maine.

All that is needed now is to find the time, T, at which the moon is due South. This is shown in Fig. 3. Again, the dates are the starting times of the periods, which are about 29 days long. The time can then be read directly in local standard time. For example, the moon is due South at midnight on July 12, 1965. On August 3, 22 days later, the moon should be due South at about 4:40 P.M. local standard time. As before, Fig. 3 represents an average curve for 1965, computed for an observer at the middle of the United States. East and West Coast times may be off by several minutes.

In summary, the complete procedure is:

a) Given the date, find D from Fig. 1.

b) Given the date, find T from Fig. 3.

c) Knowing D and T, enter Fig. 2, reading off azimuths and elevations at hourly intervals before and after T. For illustration, let's say we want the azimuth and elevation of the moon on August 3, 1965. From Fig. 1, $D = -4$ degrees, and from Fig. 3, T = 4:40 P.M. In Fig. 2, the $D = -4$ degrees curve must lie a sixth of the way down from $D = 0$ degrees to $D = -25$ degrees. Pencilling a curve like that in, at $T - 3$, that is at 1:40 P.M., the azimuth is 127 degrees and elevation is 29 degrees. At 2:40 P.M., the azimuth is 141 degrees, and elevation 32 degrees. Following along, we can find elevation and azimuth every hour. Sounds a little complicated at first, but with some practice, it becomes quick and easy.

The Moon's Position: Exact Way

For the man who has everything — a 300-foot dish and an IBM computer — the easy way may be neither satisfying nor accurate enough. For the man with such excellent capabilities, we offer a cookbook which shows one way of computing the moon's elevation and azimuth. We won't define things like hour-angle, for these definitions would constitute a full course in astronomy. Rather, we will just tell you how to compute, and let you study the references if you wish.

The first step is to compute the local sidereal time, which we call T_s. Pick a Greenwich Mean Time, T_g, for which we want to compute the moon's position in the sky. At this point we must refer to *The American Ephemeris and Nautical Almanac, 1965* (or whatever year you wish) which is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. Copies are often available at nearby observatories, and occasionally at nearby universities. In the *Ephemeris*, under the section

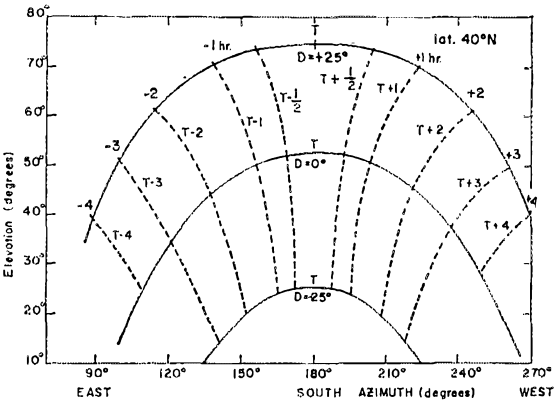


Fig. 2—Azimuth and elevation of the moon.

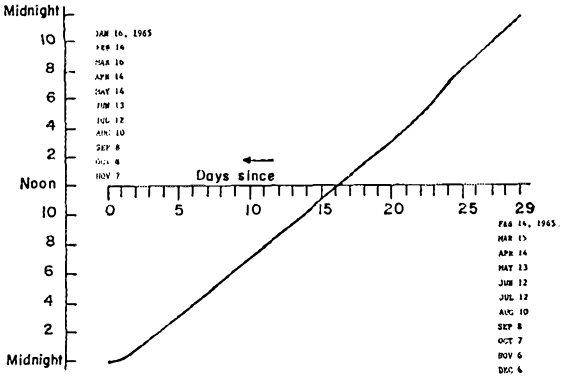


Fig. 3—The average local standard time at which the moon appears due south.

titled "Universal and Sidereal Times, 1965" there is a column called "Sidereal Time, Hour Angle of the First Point of Aries — Apparent." One entry is given for each day of the year. Look up the value for the date you wish, and call the value T_a. Then the local sidereal time may be computed from

$$T_s = 1.002778T_g + T_a - 24\frac{l_1}{360}$$

where l_1 is your longitude in degrees, west of Greenwich. Next, compute the hour angle of the moon; call it *h.a.m.* To do this, in the *Ephemeris*, in a section titled "Moon, 1965, For Each Hour of Ephemeris Time," for each date there is a column showing "Apparent Right Ascension" for each hour of time. Look up the Apparent Right Ascension for the date and time of interest; call it *r.a.m.* Then the hour angle of the moon, in degrees is:

$$h.a.m. = (T_s - r.a.m.)\frac{360}{24}$$

Next, we compute the elevation of the moon; call this angle E. This is computed from

$$\sin E = (\sin D \times \sin l_2) + (\cos D \times \cos l_2 \times \cos h.a.m.)$$

where l_2 is the latitude of the observer and D is obtained from the column "Apparent Declination" which is just to the right of the "Apparent Right Ascension" column in the *Ephemeris*. Having found E from the tables of trigonometric functions, look up cos E. Then the azimuth, A, can be computed from:

$$\cos A = \frac{\sin D - \sin l_2 \times \sin E}{\cos E \times \cos l_2} \text{ and}$$

$$\sin A = \frac{\cos D \times \sin h.a.m.}{\cos E}$$

From the trigonometric tables, we can then look up A.

For the person who needs this accuracy, and has access to an IBM computer, a Fortran program for the above may be obtained by writing the author.

Summary

To permit aiming antennas at the moon through cloudy skies, we have shown two ways of computing the position of the moon in the sky. The first way is as simple as we know how to make it. Its accuracy is poor by astronomical standards, but should be sufficient for most amateur applications. The second way is more accurate, but involves tedious computations. We comment that we have ignored certain fine points in the second method, such as the difference between Ephemeris and Greenwich Mean Time and the fact that the Ephemeris values of right ascension and declination are as seen from the center of the earth. Such refinements can be introduced if the need for ultimate accuracy arises.

References

For a general reference which provides an excellent introduction to the terms and ideas used here, we would recommend *Astronomy*, by R. H. Baker (D. Van Nostrand Co., Inc., 1960). For more detailed information, which includes the derivation of expressions like those which we have used in the Exact Method, we could recommend *Elementary Mathematical Astronomy*, by C. W. C. Barlow and G. H. Bryan, as revised by H. S. Jones (University Tutorial Press, Ltd., 1961). Tables in Figs. 1, 2 and 3 were supplied by the High Altitude Observatory, Boulder, Colorado.

Strays

We regret to report that the Radio Amateurs' Notebook, a weekly amateur radio program produced by W2BAK and announced by W2SKE over VOA, has been discontinued.

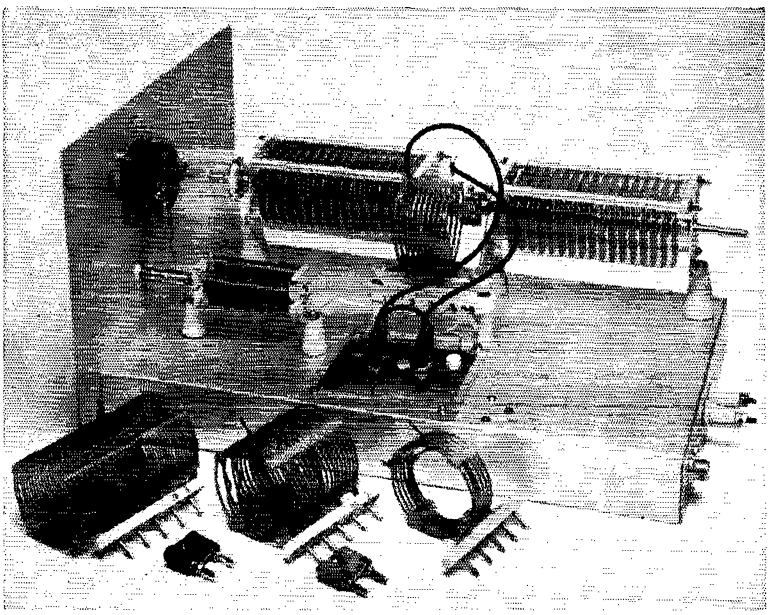
—•••—

Here's a good public relations idea for progressive clubs to note. The Orlando Amateur Radio Club this year awarded cash prizes and ribbons at the Orange County Regional Junior and Senior High Schools Science Fair. Winners were selected in the communications category in the physics classification. The club's first- and second-place selections also received first- and third-place prizes in the overall physics classification.

For over 25 years W9YOM and W9OTL have kept weekly skeds, except for wartime shut-down. The skeds started out on 1805 kc. in 1938, and now are on 3900 kc. How many other of our readers have kept schedules for so long a period?

—•••—

Kiwanis International is undertaking a program to foster person-to-person contacts internationally, and to establish Kiwanis clubs overseas. All ham members of Kiwanis who would like to participate in this program, establishing district nets and contact with business and professional men here and overseas, are asked to get in touch with Judge Leon T. David, W6QFA, 10633 Le Conte Ave., Los Angeles, Calif.



Here is the completed transmatch. On the far side are the ganged capacitors, C_2 and C_3. The jack bar for the plug-in coils is mounted on one-inch isolantite standoff insulators. When mounting the jack sockets in the Lucite panel be sure to allow at least ¼-inch clearance from the chassis. In the foreground are the 80-, 40-, and 15/10-meter coils. Also shown are the connecting bars for the series tuning configuration.

A Versatile Transmatch

Plug-In Coils for Better Circuit Operation

BY LEWIS G. McCOY,* W1ICP

NEARLY all bandswitching transmitters cover the 80- through 10-meter bands, and a very large number of them are designed to work into 50-ohm loads. In some of these transmitters there is no adjustment provision in the final amplifier for handling other than 50 ohms. Unfortunately, very few, if any, antennas will provide a purely resistive 50-ohm load across an amateur band. This means that an adjustable coupling network is required between the final amplifier of the transmitter and the feed line — namely, a transmatch. Basically, a transmatch is a tunable matching circuit that goes between the transmitter/receiver combination and the antenna system.

The transmatch will do several things for your station. First — and most important, to the Novice — it will attenuate harmonics coming out of the transmitter. Second, it will provide an adjustable coupling circuit so your transmitter can work into a proper load. Third, it will add selectivity in receiving; in many instances a strong local broadcast station will overload the receiver's front end, causing a lot of cross-modulation or "hash." A transmatch will help prevent this type of overloading.

About a year ago, we described a transmatch [1] designed to cover the 80- through 10-meter bands. The inductance used in this unit consisted of a single length of coil stock 2½ inches in diameter and having about 80 turns. In order to change bands, unused portions of the coil were shorted out. On 20, 15 and 10, a lot of unused coil stock had to be shorted out, and while the transmatch would work, adjustment was very critical.

The best way is to have a separate coil for each band. However, if bandswitching is used, the transmatch becomes bulky and a complex switching arrangement is required. In addition, if high-power operation is contemplated, the switch has to be rugged to withstand the high r.f. voltages developed in the circuit. High-power wafer-type switches are available, but the cost is prohibitive. The obvious answer is to use plug-in coils. It is simple to come up with a plug-in coil design that allows fast band changing and which therefore should satisfy any user.

* Beginner and Novice Editor.

[1] McCoy, "A Completely Flexible Transmatch for One Watt to 1000," *QST*, June, 1964.

Before going into the construction details of the transmatch let's discuss antenna-system loads and what's involved.

Multiband Antenna-System Loads

Fig. 1 is a drawing of a simple dipole, center-fed, with a balanced feeder. We have shown an open-wire feeder but it could just as well be a good grade of 300-ohm TV-type Twin-Lead. This antenna system is an excellent one for multiband operation.

You'll note that no dimensions are given for length of the antenna or feeder. In theory, the antenna can have any convenient over-all length and it will still work as a multiband antenna. However, in practice it is a good idea to make the antenna at least ¼ wavelength long at the lowest operating frequency — for example, about 60 feet if 80-meter operation is planned.

How long should the feed line be? Long enough to reach from the antenna to the transmatch in the shack!

Now we get to the meat of the problem. Note that nothing has been said about antenna impedances, s.w.r., and so forth. Believe it or not, the antenna impedance and the s.w.r. are of no real concern in this case. First, we are using a low-loss type of feed line, and consequently can

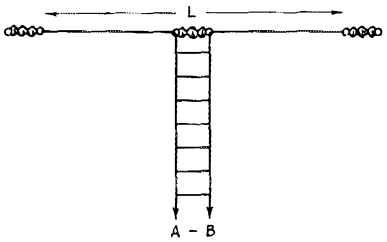


Fig. 1 — A typical center-fed dipole with balanced feeders. As mentioned in the text, the length L is not critical but preferably should be at least ¼ wavelength at the lowest operating frequency.

tolerate a high s.w.r. without having any appreciable power loss in the system. The fact that we can have a high s.w.r. without loss means, in turn, that we don't need to be concerned about the match between the feed-line impedance and that of the antenna.

It would be wise to point out that such an antenna could not be used as a multiband job if fed with *coax*, because the s.w.r. on some bands will be very high. Coax is not a low-loss line, and when the s.w.r. is high the losses can be excessive.

With open-wire feed, the only real problem is getting the transmitter to work into a 50-ohm load when the antenna system can, and probably

Before any of you complete bandswitching modernists throw up your hands in horror at the thought of plug-in coils, give us a minute or two of your reading time. A "horse-and-buggy" type transmatch may be the best answer to your coupling problems.

does, offer an actual load much different from 50 ohms. This is where the transmatch comes into the act. We don't know what the impedance is across points A and B in Fig. 1, and for that matter, we don't really care. All we have to do is couple this unknown load through the transmatch so that the transmitter "sees" a 50-ohm load. The unknown load can be very low impedance, as low as 10 ohms, or it can be very high, on the order of 4000 ohms. Some newcomers have the mistaken idea that if you use a 450-ohm line (a common value for TV "ladder line") the load will be 450 ohms. It *can* happen that the load would be exactly the same as the line impedance but it is very unlikely. In any case, if the transmatch is designed to handle a wide range of impedances it can be adjusted so that the transmitter is working into a 50-ohm load.

How does one go about determining that the transmatch is properly adjusted so the transmitter sees a 50-ohm load? Fig. 2 shows a typical installation where 50-ohm coax is used to connect the transmitter to the transmatch. A Monimatch is inserted in the coaxial line, and the transmatch is adjusted so that the Monimatch shows a 1-to-1 standing-wave ratio on the coax line. When the transmatch is so adjusted, the transmitter is working into a 50-ohm load.

Circuit Details of the Transmatch

Fig. 3 shows the three arrangements that can be used in this transmatch: parallel tuning at A and B, and series tuning at C. As you'll see in a moment, when we discuss adjusting the transmatch, the feeders are tapped on the secondary coil when parallel tuning is used. If the load impedance to the transmatch is low, the taps will be across only a few turns at the center of the coil. If this low load impedance is highly reactive, as may be the case with some feeder lengths, a great deal of current can flow through these few turns, causing a large amount of heat to be generated. With high power, this could destroy the coil. By using series tuning with such "poor" low-impedance loads, this problem is eliminated.

The high- and low-C arrangements (A and B, respectively) for parallel tuning widen the tuning

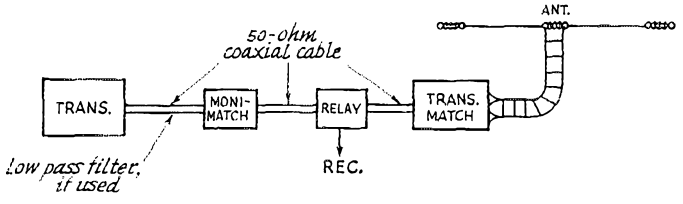


Fig. 2—This drawing shows a typical station setup.

range of the transmatch. For example, with the 80-meter coil specified in Table I you can tune the MARS frequencies both below and above the 3.5-Mc. band.

The process of setting up the transmatch for the three conditions — parallel tuning with low C_1, parallel tuning with high C_1, and series tuning — is accomplished by using shorting bars which are plugged into jacks. The complete circuit is given in Fig. 4.

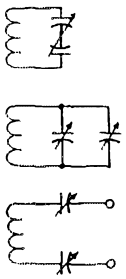


Fig. 3—The three possible configurations of the transmatch. (A) parallel tuning, low C_1 (B) parallel tuning, high C_1 (C) series tuning.

An important advantage in using plug-in coils is that the link circuit (L_1C_1) can be properly designed for each band. In this unit, the link is designed so that C_1 has the proper range for each band.

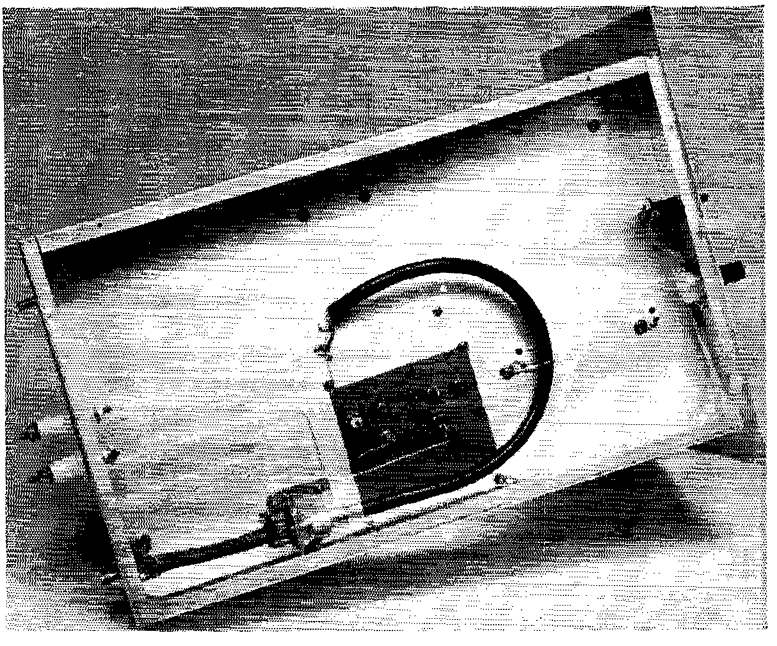
One other feature of this transmatch is the inclusion of a Monimatch built into the chassis. In addition to its use in adjusting the transmatch, the Monimatch also will serve as an output indicator for the transmitter. Of course, if you already have a Monimatch or similar s.w.r. bridge this one can be omitted from the unit.

Construction

The transmatch shown in the photographs is designed for 1-kilowatt input on c.w. or 2 kilowatts p.e.p. on single-sideband, and about 500 watts on a.m. The two capacitors in Fig. 4, C_2 and C_3, have 0.125-inch spacing between plates. We tested the unit at a full kilowatt input under a wide range of conditions, and in no instance did the capacitors arc over from high r.f. voltages. For Novice powers and the popular 150- to 250-watt class, capacitors with smaller plate spacing could be used. A plate spacing of 0.075 inch is adequate for these lower power levels. The stators and rotors of C_2 and C_3 must be insulated from each other. The Johnson types used have enough rotor shaft extension in the rear so that an insulated shaft coupling can be used. If capacitors without a rear shaft extension are used, they could be coupled together by means of a right-angle drive. Although C_2 and C_3 as specified have approximately 150-pf. maximum capacitance, 100-pf. units could be used with a small sacrifice in tuning range.

Banana plugs and jacks, Johnson types 108-301 and 108-901 respectively, are used for the feeder taps and for changing from series to parallel tuning. The jacks are mounted on a piece of Lucite 4½ inches square and ¼ inch thick. A 4-inch-square hole is cut in the chassis top and the Lucite plate is mounted over the hole. Leads from the capacitors and the coil jack bar go through holes in the Lucite plate and are soldered to jack bases.

C_2 and C_3 are mounted on 1½-inch isolantite standoff insulators. The rotor of C_1 can be grounded directly to the panel, if desired, but we mounted it on 1-inch standoffs to get a better panel arrangement for the controls. Two isolantite feedthrough insulators for the antenna feeders are mounted on the rear of the chassis, and leads from the feedthroughs go to two jacks on the Lucite plate.



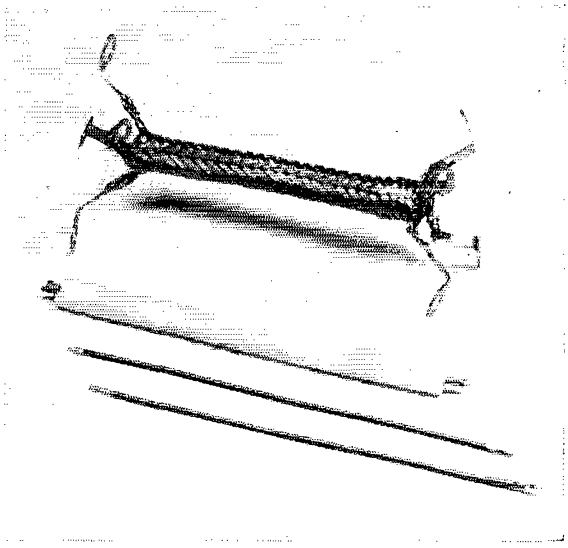
This view shows the method for installing the Monimatch which is visible at the lower left-hand corner. A length of coax is used to connect from the Monimatch over to L_1 (above chassis). The outer shield of the coax is grounded to the chassis near the hole for the inner conductor.

Monimatch Details

Following an article on the Monimatch Mark III and IV,[2] George Schleicher, W9NLT, came up with an excellent design that eliminated stray coupling.[3] The Monimatch used in this transmatch is an extension of his design. To differentiate between the two, his will be designated Mark V, and this later version Mark VI.

In the Mark VI, a 4-inch length of RG-8/U coax cable is used. First remove the black outer covering and then slip the outer braid off the piece. Cut away enough insulation to leave the inner conductor exposed for ¼ inch at each end. Next, tape two pieces of No. 14 solid wire, 4 inches long, on opposite sides of the polyethylene that surrounds the inner conductor. Then slip the outer braid back over the assembly and connect four soldering lugs at each end as shown in the photograph. These lugs will be mounted under the screws holding the coax fittings. The ends of the No. 14 pickup wires are bent ⅛ inch outward at each end for connecting the diodes and terminating resistors. If you happen to use enameled wire don't forget to remove the enamel from the ends before soldering the diodes and resistors! And be sure to use long-nose pliers to hold the lead of the diode being soldered, in order to keep the heat from the soldering iron from reaching the diode and ruining it.

The leads between the diodes and the meter should be shielded to prevent stray r.f. pickup.



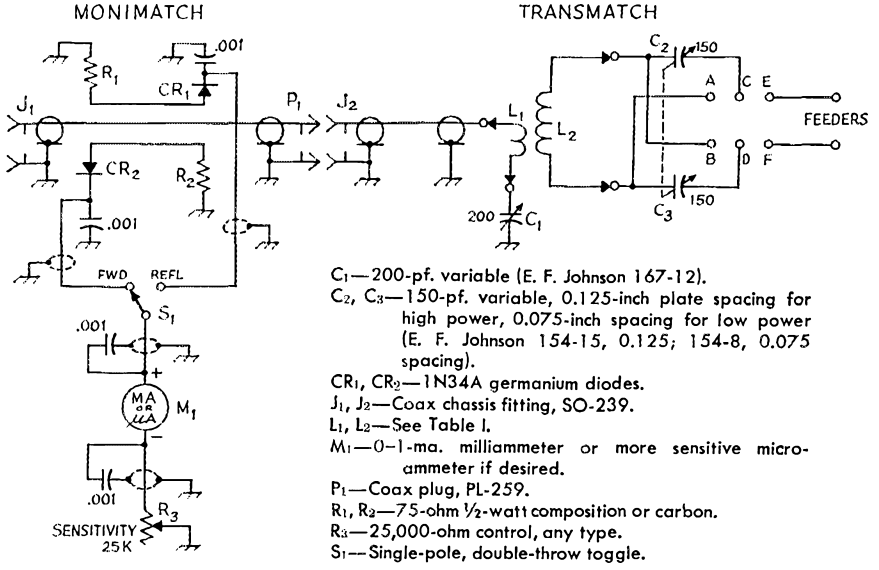
This shows the method for making up the outer shield covering for the Monimatch section. Four soldering lugs are soldered on each end of the braid and the lugs are mounted under the four nuts holding each of the coax chassis connectors. Shown below the braid section is the inner conductor with its insulation and the two pickup wires.

Coil Information

L_1 and L_2 are made from standard coil stock (Table I). The coil assembly is mounted on a Millen type 40305 plug. No special support is required for the coil as the stiffness of the coil leads is sufficient. The link, L_1, is mounted in the center of L_2 and is held in place by connecting the support bars together with Duco. Spaghetti tubing should be slipped over the link leads where they go through L_2 to the plug. Before soldering the ends of the coil leads to the plug, file the ends of the plugs lightly as the nickel coating is difficult to solder to. The jack bar for the coils is a Millen type 41305.

[2] McCoy, "Monimatch Mark III and IV," *QST*, October, 1964.

[3] Schleicher, "Technical Correspondence," *QST*, March, 1965.



C_1—200-pf. variable (E. F. Johnson 167-12).
C_2, C_3—150-pf. variable, 0.125-inch plate spacing for high power, 0.075-inch spacing for low power (E. F. Johnson 154-15, 0.125; 154-8, 0.075 spacing).
CR_1, CR_2—1N34A germanium diodes.
J_1, J_2—Coax chassis fitting, SO-239.
L_1, L_2—See Table I.
M_1—0–1-ma. milliammeter or more sensitive microammeter if desired.
P_1—Coax plug, PL-259.
R_1, R_2—75-ohm ½-watt composition or carbon.
R_3—25,000-ohm control, any type.
S_1—Single-pole, double-throw toggle.

Fig. 4—Circuit diagram of the transmatch. All 0.001-μf. capacitors are disk ceramic.

Table I

	L_1				L_2			
Band	*Turns*	*Wire Size*	*Diam. Inches*	*Turns per Inch*	*Turns*	*Wire Size*	*Diam. Inches*	*Turns per Inch*
3.5	10	16	2	10	44	18	2½	10
7	6	16	2	10	18	16	2½	6
14	3	16	2	10	10	16	2½	6
21/28	2	16	2	10	6	16	2½	6

Note: L_2 for the 3.5-Mc. coil can be made from Illumitronic Air Dux type 2010T. The remaining L_2 coils can be made from a single length of Air Dux 2006T or B & W type 3905-1.
All the L_1 coils can be made from a single length of Air Dux 1610T or B & W 3907-1.

Adjustment Procedures

Once the transmatch is completed and your antenna system is installed, you are ready to check out the entire system. Referring to Fig. 4, and using the 80-meter coils, connect your feeders to the feedthrough insulators mounted on the chassis rear. Connect a jumper between terminals C and D on the Lucite plate. This will set the tuner up for parallel tuning with low C. The clips for tapping the feeders on L_2 should be connected to terminals E and F. Connect the clips a few turns each side of the center of L_2. Tune up the transmitter on 80, and feed enough power through to get a reading on M_1 with S_1 in the "forward" position. Next, switch S_1 to "reflected" and adjust C_1 and the C_2C_3 combination for the lowest meter reading. You may have to retune the final amplifier for a sufficient "forward" reading as you make these adjustments. In *any* case, you want to shoot for a minimum "reflected" reading while maintaining a fairly high "forward" reading. Once you find this setting, try moving the taps from E and F farther apart and matching again. The farther apart they are, the broader the tuning of the transmatch will be, which means you can QSY farther in the band without readjusting the transmatch.

If you find that you cannot get a match unless the taps are very close together, or when you increase power to normal input the center of the coil gets hot, switch to series tuning. Remove the tap leads from the coil and terminals E and F, connect jumpers from E to C and D to F, and try matching again. You'll quickly find a setting of C_1 and C_2C_3 that will give a match.

The same procedure should be followed in tuning up on the other bands. For the small expense involved, it is probably best to use a separate set of tap leads for each band, leaving them permanently connected to the coils, when parallel tuning is used. This speeds up band changing.

In some instances, you may find that with low-C parallel tuning C_2C_3 reaches maximum capacitance just as you approach a match. In such case try high C. For this arrangement connect jumpers from terminals A to C and B to D.

We have purposely discussed only center-fed, balanced-line antennas. In talking to many hams who use random-length "long-wire" antennas fed at one end with a single wire, we have always found that center feed could have been used. Admittedly, it is very nice if you can bring your feeder straight away from the antenna, but even if the feeder has to parallel a portion of the antenna, the center-fed antenna is a much better performer. If you insist on using end-fed random-length wires, there is a transmatch designed for that purpose in the transmission-lines chapter of *The Radio Amateur's Handbook*.

On the other hand, some amateurs are reluctant to use anything but coaxial line because they believe that TVI is worse with open-wire or Twin-Lead feeders. This is false. If your transmitter is adequately shielded — and in an area where TVI is likely to be a problem the rig *should* be shielded — and you use a low-pass filter, you have no harmonics coming out of the transmitter and you can use any kind of feeder. However, low-pass filters shouldn't be operated in lines that have an s.w.r. of more than 2 or 3 to 1 because the voltage developed in the line may be high enough to ruin the filter components. With a transmatch this is no problem, because the short section of coax line where the filter is installed can always be properly matched — another reason for using a transmatch! QST

Strays

Stolen Equipment

HE-45 6-meter transceiver, serial No. T45576, with squelcher and Turner 350-C microphone. Contact Ron Kushnier, K3JGD, 5870 Overbrook Ave., Philadelphia, Penn. 19131.

Don Wright, W7HH, is the new amateur radio operator on the Hospital Ship *S.S. Hope*, currently located at Conakry, Guinea. Don sends word that he will monitor 14.250 Mc. for any traffic to the *Hope* at the following times (GMT): Daily 1230–1330, 1400–1500, 1900–2000.

That's a Hot One

BY JOHN G. TROSTER,* W6ISQ

CHARLIE . . . my gosh, Charlie . . . what happened around your shack here? Looks like a tornado hit."

"Naw . . . just rebuilding a part of the final."

"Yeah, but all them bits and pieces and stuff lying around all over the place, I thought an explosion or . . . you say you're *whaaaatt?*"

"I'm rebuilding a few interesting new features into my old final. Just took it apart this morning and . . ."

"You mean . . . you mean you unscrewed all them tubes and pieces outa the box . . . and . . . now you're gonna put 'em all back in?"

"Well yes, that's the general idea. Only I'm going to put some *different* pieces back in. Like I said, I'm changing a few things . . . update it a bit . . . you know . . ."

"Oh yeah . . . yeah, sure. Well, now . . . been thinkin' of doing that at my place too . . . soon's I get a free afternoon."

"Good idea. You ought to get in there once in a while and clean it up a bit . . . lube the fans, test a few tubes, might even change things a bit like I'm doing here."

"Yeah Charlie, guess I should rewind a coil or somethin' like that. Suppose things get rusty after a while . . ."

"Ahhhh . . . well, at least blow the dust off now and then."

"Hey, you got awful big resistors in this thing, Charlie."

"That's a coil."

"Ohhhh . . . I *thought* it was kinda round for a resistor. Guess resistors are a lot more zig-zag shaped than coils . . . like it shows in the diagrams . . . yeeeeeaaahh. Well, now, that sure is a fancy lookin' tube ya got there, Charlie. Looks like it's got a handle on it."

"That's not a tube . . . it's a vacuum variable condenser."

"What happened to all them plates that used to weave in and out?"

"Oh, they still use 'em all the time. Only I just decided to use these vacuum variables for this special rig."

"And what's this round little frilly-lookin' can? Looks like a inverted mushroom."

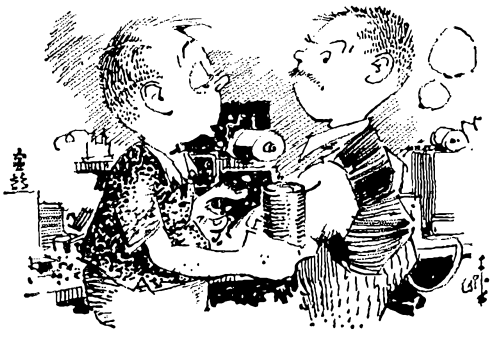
"*That's* the tube."

"But there ain't no glass on it. How they tell when the light goes on inside?"

"Snap the switch and watch the meters."

* 45 Laurel Ave., Atherton, Calif.

YOU GOT AWFUL BIG RESISTORS IN THIS THING, CHARLIE...



"That's the trouble with this stuff. They're always trying to complicate it up so's ya can't tell what's going on."

"Oh noooo . . . some of these newer things make the whole rig much easier, simpler, safer, better, more powerful, more efficient . . . don't you think so?"

"Well . . . sure I agree. And, of course, I'd of rebuilt my *whole* entire rig a long time ago, but there's no use makin' all them changes and improvements if it's gonna be out of date even before I get it finished. How long they been makin' tubes in cans?"

"Ohhhh . . . 20 . . . maybe 25 years."

"Hmmmm . . . well, naw, I definitely decided I'm not gonna rebuilt until they make up their heads if tubes is glass or not, and if condensers has plates or looks like a model ship in a bottle."

"Yes . . . I understand *your* problem. Ok, stand back and we'll hook on the power supply . . . the wires here . . . dummy load . . . and throw the . . ."

"WAIT WAIT . . . hold on . . . *don't throw the switch.*"

"Ahhhhhhhhhaaaaaa . . . who . . . wha . . . what happened . . . get your hand caught in the power . . . ?"

"Noooo, but look here Charlie old man . . . ya forgot to put one of the biggest parts back inside your box . . . might wreck things."

"Where? . . . I don't see any extra parts . . ."

"This thing . . . right here."

"*Don't touch it* . . . it's still hot. That's the soldering iron." QST

A Sweep-Tube Linear Amplifier for 75 Meters

BY LYMAN H. WOLFLA, II,* K9LZJ

MANY amateur radio operators using low-power s.s.b. and c.w. exciters would like to increase their transmitter power output to the 200- to 300-watt level. In order to meet this need, and keep cost as low as possible, I designed the amplifier described in this article. I have a Heath HX-20 s.s.b. transmitter which operates at 90 watts p.e.p. input. The addition of the sweep-tube amplifier helped to make my signal better heard on 75 meters.

I wanted to build a grounded-grid amplifier because it offered low cost and simplicity. My biggest problem was in choosing a tube type that would operate with low plate voltage and still be capable of reasonable power output in Class B grounded-grid configuration. I also wanted to feed the excitation from the Heath exciter into the cathode circuit of the amplifier.

I received a technical bulletin from RCA which described their new 6JB6 beam power tube. After looking over the "specs," I knew the 6JB6 would be the tube for my amplifier. I designed the circuit around two of these tubes, which helped to keep cost as low as possible.

* 8333 Park Ave., Indianapolis, Indiana.

The Power Supply

The power supply is located at one end of the chassis and can be seen in Fig. 1. Solid-state rectifiers are used in a bridge configuration, aiding in heat reduction and requiring less space than vacuum-tube types. The power transformer can be removed from an old TV set and should provide 6.3 volts a.c. at 4 amperes and have a high-voltage winding capable of delivering 700 volts, center-tapped, at between 200 and 300 milliamperes. The silicon rectifier diodes I used were surplus units purchased from a nearby radio store. They are rated at 750 ma. and are 400-p.i.v. units. A 0.3-megohm resistor is paralleled with each diode to provide correct voltage division, helping to protect the diodes from damage. Three 20-μf. 450-volt filter capacitors are series-connected in the power supply to provide adequate voltage rating.[1] A 56,000-ohm 2-watt resistor is placed across each capacitor to provide voltage equalization, and to serve as a bleeder network. The 5-volt winding on the transformer is not used.

The Amplifier

External excitation is applied to the cathode circuit of the amplifier through a 0.0012-μf. capacitor. The cathodes of the 6JB6s are placed above r.f. ground through a 2.5-mh. r.f. choke. Examination of Fig. 2 will show how the grids of both tubes are connected together and bypassed to ground through a 0.004-μf. capacitor. This was necessary so that 9 volts of negative bias could be used to keep the no-signal plate current down, and to establish the operating parameters I desired. A 9-volt transistor radio battery was used for this purpose and can be seen in Fig. 3. Each 6JB6 plate lead contains a parasitic suppressor composed of five turns of No. 18 enamel wire, space-wound over a 100-ohm

[1] Additional power-supply filtering may be desired by the builder. The filter capacitors could be replaced by 100-μf. units. — *Editor.*

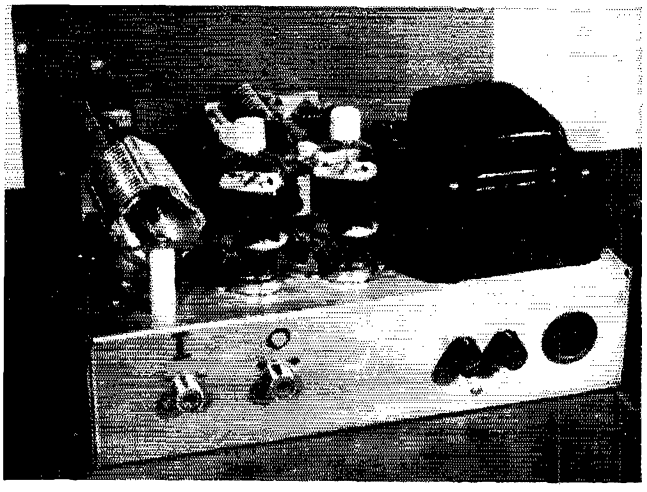


Fig. 1—Rear view of the linear amplifier showing the placement of power supply and amplifier components.

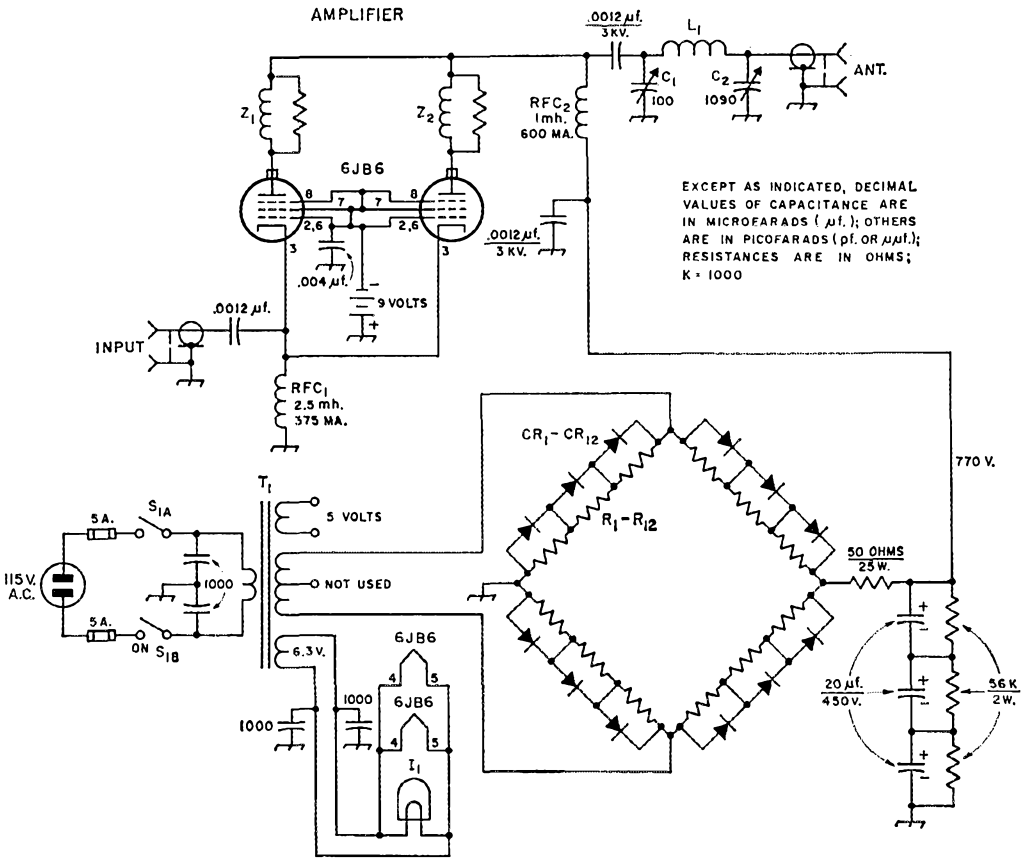


Fig. 2—Schematic diagram of the 80-meter linear amplifier.
Capacitors are disk ceramic; resistors are 1-watt composition unless otherwise stated.

C_1—100-pf. variable capacitor, 0.125-inch spacing (E. F. Johnson 154-14 usable).
C_2—3-gang broadcast-type variable capacitor (all sections in parallel).
CR_1–CR_{12}—Silicon diodes, 750 ma., 400 p.i.v.
L_1—Air Dux coil No. 1411-A (18 μh.).
I_1—6.3-volt pilot lamp.
R_1–R_{12}—0.3 megohm, 1 watt.
Z_1, Z_2—Parasitic choke (see text).
T_1—See text.

2-watt resistor. The suppressors are connected between the tube plate caps and the choke, RFC_2. The output circuit of the amplifier consists of a conventional pi-network tank made from a No. 1411A Air-Dux coil. The plate tuning capacitor is a war-surplus, 100-pf. unit.[2] The pi-network output capacitor is a 3-gang broadcast-receiver type, with all three sections in parallel.

Layout and Wiring

The general layout can be seen in the photos. The important consideration is to keep the leads short, while providing ample room for all of the components. The silicon diodes and filter capacitors are mounted under the chassis as shown in Fig. 3. The diodes and their associated resistors are mounted on a piece of fiberboard about 3 by 5 inches in size. Solder lugs, held in place with 6-32 bolts and nuts, are used as tie points, permitting the diodes to be placed above the board and the resistors across them on the opposite side of the board.

A short length of coaxial cable is connected between the pi-network output capacitor and the coaxial antenna terminal at the rear of the chassis. An additional coax connector is mounted on the rear apron of the chassis, from which excitation is supplied to the amplifier input circuit through the 0.0012-μf. capacitor. A pair of fuse holders and a chassis-mounted male a.c. power connector are also located on the rear wall of the chassis. A front panel has been added and contains the pilot-lamp assembly, amplifier tuning controls, and the "on-off" switch. The layout is not critical and can be changed to suit your ideas and parts sizes.

Final Adjustment

After the amplifier has been assembled and checked for wiring errors, the exciter should be

[2] With the capacitance value given for C_1, the tank circuit Q will have an approximate value of 3. If difficulty is experienced with antenna coupling, a higher capacitance value can be used at C_1 (a 200- to 300-pf. value in combination with fewer turns at L_1), to increase the Q. — *Editor.*

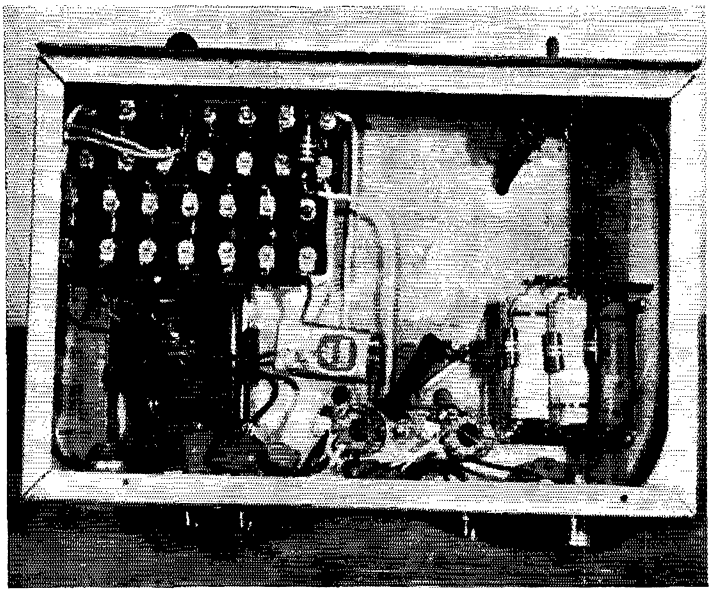


Fig. 3—Bottom view of the amplifier, showing placement of power-supply components.

connected to the input terminal at the rear of the amplifier chassis through a short length of coaxial cable. With the linear amplifier's power supply turned on, the no-signal plate current should be appropximately 2 ma. Next, an s.w.r. bridge is connected between the output terminal of the amplifier and a suitable dummy load. A small amount of signal is applied to the amplifier from the exciter and the pi-network plate tank is tuned for maximum forward power indication on the s.w.r. bridge. For c.w. operation, the drive is increased until the plate current reads approximately 420 ma. Tune-up is the same as with other linear amplifiers, and maximum plate current on voice peaks, when operating s.s.b., should be 180–200 ma. If an iscilloscope is available, proper adjustment of the amplifier can more readily be assured. For s.s.b. operation, I adjust the excitation to the amplifier so that I have 40 per cent of the power output obtainable with full carrier insertion.

In Conclusion

It is obvious that a number of improvements could be made to make this amplifier more versatile. I did not make provision for switching bands, nor was a plate-current meter included, in an effort to minimize cost.

The amplifier was designed for operation in the 80-meter band, but by using a short length of heavy, insulated wire with alligator clips attached to each end, portions of the plate coil can be shorted out. This will permit the unit to operate in the 40- and 20-meter bands.

I have used this amplifier during the past year for 80- and 40-meter c.w. and s.s.b. operation. I have experienced no trouble with it, and the original battery and tubes are still being used, apparently in perfect condition.

I wish to thank Mr. D. J. Angus for his help with the photos used in this article. Additional credit is due for ideas supplied by other friends. Could your low-power s.s.b. exciter use a pair of inexpensive "shoes"? This little amplifier could be the answer to your need for a moderate boost in signal! QST

Strays

Even W6MLZ (whose weekly column on ham radio appears in the Los Angeles *Herald-Examiner*) is subject to those typographical errors that creep in from time to time. A recent description of an old-time station mentioned that the receiver used a Chrysler detector!

—•••—

From a letter addressed to our Technical Information Service. "I built the monitor-oscillator written up in January *QST*, but when I turn off my transmitter it keeps practicing. What do I do now?"

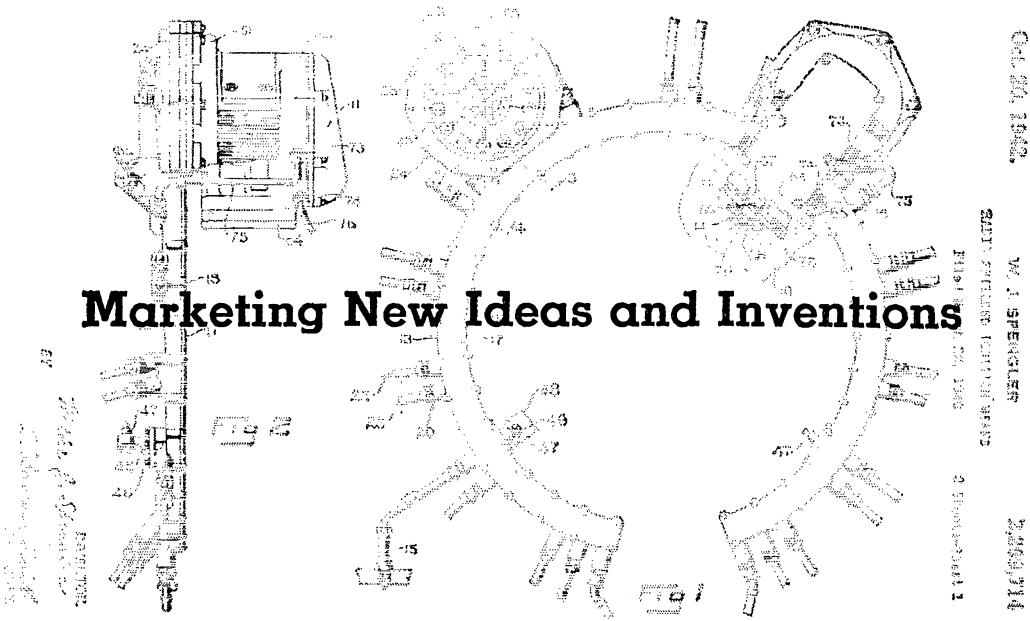
—•••—

VE3GG tells us that CFCL-TV, Timmins, Ontario, has a weekly ham program, each Sunday at 12:15 local time, which will run all through 1965.

—•••—

Apparently not by prearrangement, WØMOW had his first c.w. QSO with WØBFV, his first a.m. QSO with WØBFV, and similarly his first s.s.b. QSO. No, they're not next-door neighbors!

WA5DCH (l.) of the Arlington (Texas) RC presents the Ham-of-the-Year Award to W5LNF for his work in teaching code and theory classes.



Marketing New Ideas and Inventions

BY JOSEPH F. VERRUSO * K2THV

TODAY there exists a need for more new ideas and inventions, for as man progresses further into space and electronics, new and more difficult problems will arise. Some of these problems will require a great deal of technological skill and will therefore have to be solved by private industry. However, there may be some problems that can and should be solved by the independent inventor and researcher.

Prospective inventors may not know how to market a new idea or invention. The inventor's first concern before marketing any invention is to provide himself with the greatest possible protection against loss or infringements on his invention. This protection is only afforded by a patent grant issued by the Federal Government, which gives the inventor and his heirs exclusive rights to his invention. However the patent system is a slow process. It often takes from three to three and one half years before a patent is issued and in some cases the inventor may find his invention is not patentable.

Should the inventor decide to market his invention without a patent grant, there are certain precautions that must be observed in order to protect his rights. The Federal Government has established an agency which affords the inventor maximum protection for his invention and assists him in its marketing. The name of this agency is the National Inventors' Council. It will evaluate the ideas and inventions of independent inventors and pass this information to the proper military facilities or to other Government agencies. Should the military or other Government agencies wish to use the invention, the result will be a profit for the inventor. It is important to remember that the key to the successful marketing of any item is the *need* for that particular item, for a profit can only be obtained from an invention when that invention has features that are outstanding enough to attract the government, industry, or the general public.

This article discusses the task of the National Inventors' Council and the procedure used in submitting new ideas and inventions for evaluation, and tells the prospective inventor what steps to take in the advancement of his ideas.

National Inventors Council

Although problems concerning space travel are glamorous and exciting, the layman inventor should focus his attention to some of the other problems now confronting the National Defense Program. Today more than ever before, the government is in dire need of any information that may help strengthen the national defense of our country. Since the National Inventors' Council was first formed, thousands of ideas have come from inventive citizens across the nation and it has been these ideas that have helped to shape our present-day armed forces.

The idea of such a council was first conceived in 1940 by Lawrence Langner, an international patent attorney, who felt that an agency should be established to evaluate the ideas and inventions of independent inventors and researchers. With the assistance of well-known inventors and with strong support of the military, the idea of forming a council was brought before the Secretary of Commerce. In the fall of 1940, with the approval of the President, the National Inventors' Council was formed as a civilian agency of the Government. It was given the task of evaluating all ideas or inventions which are submitted for review and to forward to the military any information, ideas, or inventions that may be of value to the national defense. The Council is not limited to the military alone, but also refers information to other Government departments or agencies responsible for the national welfare.

A membership-board was established to govern

* Westrex Comm. Div. of Litton Systems, One Le Fevre Lane, New Rochelle, N. Y.

the Council and assist in the evaluation of information. The board consists of a number of prominent people, each an expert in his own field. All board members serve without pay.

The N.I.C. is primarily interested in information, ideas, and inventions that may be of value to the national defense or welfare and is unable to evaluate inventions of a civilian nature. The National Defense Program isn't limited to weapons alone, but also includes the normal, everyday items that are used by servicemen. Industry and the general public are informed of the problems facing the Government through publications such as *Inventions Wanted By the Armed Forces and Other Government Agencies*, which can be obtained by writing to the U. S. Department of Commerce, Washington 25, D. C. This pamphlet will enable prospective inventors to direct their attention to specific problems which are of current interest to the armed forces. Inventors working on their own projects may also submit their ideas and inventions and, in this way, avoid having to contact each branch of the service individually. The Council, with its various facilities, is able to evaluate all information with the utmost of efficiency and forward any ideas or inventions of value to the appropriate service or agency.

Although the solution to some of the technical problems of the armed forces may require a specialized background, there are many which can be solved by an imaginative layman. Some of the most difficult problems encountered during World War II were solved by free-lance inventors. The solutions to these problems were so simple that it was hard to figure out why no one had thought of the answer before. For example, during World War II there was a need for a simple means of communications between men adrift at sea and rescue or passing aircraft. The solution came from a California scoutmaster who used the principle of signaling by means of a mirror. The solution was a simple one which saved the lives of many servicemen. This is only one example, but it shows that a little imagination can achieve a great deal.

Proposal Application

An invention doesn't have to be patented before submission to the Council, for it has been found that a large percentage of the inventions submitted are not patentable. According to Government regulations, ideas or suggestions are not patentable, but will be accepted by the Council. To protect the inventor against possible loss or infringement on his invention, the council provides all possible safeguards for submitted material and keeps this material in the strictest of confidence. All incoming material is stamped with the time and date of receipt and the proposal becomes a permanent part of the government record. If litigation should occur, this record is readily available to the inventor to prove his priority right.

The Council doesn't have facilities to translate proposals written in a foreign language, so they must be written in English. If the inventor has submitted his invention to other government agencies, the name of these agencies and their decisions should also be included in the application. In this way, the proposal will not be referred to these agencies again.

The proposal should be written in a clear, concise manner: such that one skilled in the art of invention would have no difficulty in understanding the invention. If the inventor wishes, he may submit his proposal on the Council's blue disclosure form, or this form may be used as a guide in describing the idea or invention. It should contain the following:

1.) A statement which describes the features that make the invention different from existing devices.
2.) A complete disclosure of the method or principle of the invention.
3.) A step-by-step description of the invention, written so that an engineer would have no difficulty in making or using the invention.
4.) Any drawings, diagrams, or photographs which will describe the invention more fully and aid the engineer in the construction of the invention.
5.) Any performance or theoretical data which has been compiled.

It is not required that the drawings accompanying the application be drawn by professional draftsman. They may be simple freehand sketches, as long as they convey to the examining engineer the basic idea of the invention. The examining staff has had many years of experience in interpreting drawings of this type.

A model of the invention is not required (the Council does not have the storage space to accommodate such models). If after careful examination of the proposal, the examiner feels that a model will be helpful, he will notify the inventor. If a model is requested for examining, it will be forwarded to the military or returned to the inventor; but the council will not accept responsibility for loss or damage during shipping or handling. If the model is very large, it will be returned to the inventor express collect, unless it was accompanied by a signed statement giving the Council the right to destroy it after evaluation. Chemical samples are to be sent to the Council only when requested. Any unsolicited samples will be destroyed promptly, without evaluation. Chemical samples, when requested, should include formula, methods of preparation, laboratory data, and any other information that will enable the examiner to evaluate the samples.

Application Procedures

Once the application is completed, it should be carefully checked by the inventor to insure that all the subject matter required has been included in the application. The application is then mailed to the National Inventors Council, U. S. Department of Commerce, Washington 25, D. C. When it is received at the Council's offices, it is stamped with the time and date of receipt.

The proposal is examined by a member of the Council's staff, who evaluates each idea or invention while keeping in mind the needs of the armed services and government agencies. He determines the practicability and usefulness of the invention, and what features make it superior to the present-day devices. If the examiner feels that the proposal has merit, he will forward all the material to the appropriate technical group for further evaluation.

The council conducts all its operations through the mail. The inventor will be notified once the proposal is forwarded to another agency. If this agency is interested in the proposal, it will notify the inventor or have the Council communicate with the inventor. If the agency rejects the proposal for any reason, it will notify the N. I. C. of the reasons and the council will relay this information to the inventor. If the Council rejects the proposal, the inventor will also be notified.

The inventor may feel that a personal interview with the examiner may speed up the evaluation of his proposal. The Council welcomes all inventors who come and discuss their proposals, but a trip to

Washington is expensive and may not accomplish any immediate results. It is advisable that the inventor write for a specific appointment.

In accordance with Government regulations, all original material submitted will be kept on file at the Council offices and will not be returned to the inventor. Although the invention may not be of value at the present time, it may be made useful at a later date. It has been found that some of the proposals submitted may be a little ahead of the times or that an idea which was rejected once may be useful in a completely different application than that for which it was originally intended. For this reason, the inventor should keep all correspondence, even if the invention is rejected, because if the proposal is used at a later date, the inventor may have to prove his right to the invention.

Once the proposal has been accepted by an agency of the Government, it is this agency and not the Council that negotiates with the inventor for the right to use his invention. The Council's task is primarily to screen all information and to refer it to the proper agency. It is not authorized to pay the inventor.

The author wishes to express his appreciation to Mrs. Robert Bruce for her assistance in the preparation of this article.

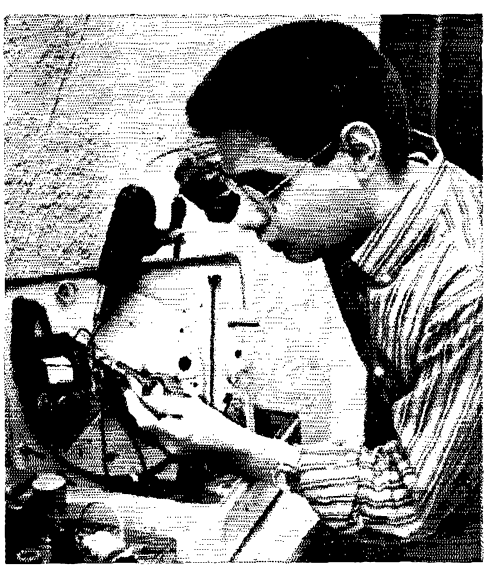
References

Publications obtainable from the U. S. Patent Office, Washington 25, D. C. by remittance payable to the Commissioner of Patents. Order patents by patent number or inventor's name and date of issue. 25¢ each.

Publications obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. or the nearest field office of the U. S. Department of Commerce. Remittance payable to the Superintendent of Documents or the issuing agency.

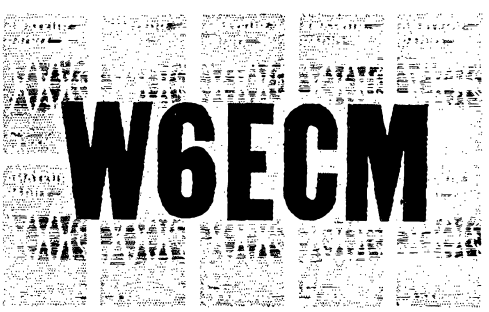
1. *Facts About The National Inventors Council* Dept. of Commerce
2. *Inventions Wanted by the Armed Services* Dept. of Commerce.
3. *Inventions Wanted by the Armed Services and Other Government Agencies*.....Dept. of Commerce
4. *General Information Concerning Patents*.....15¢ each
5. *Patent Laws*.....15¢ each.
6. *Official Gazette of the U. S. Patent Office*. Weekly each Tuesday. Annual subscription $30.00. Single copies 75¢ each.
7. U. S. Government Research Reports, Dept. of Commerce, monthly. $1.00 per year.
9. Supplementary List of Publications of the National Bureau of Standards. Issued semi-annually. Free upon request from the National Bureau of Standards.
10. *Development and Selling of New Products*. Dept. of Commerce.
11. Products List Circular.....Dept. of Commerce.
12. "Patent Information for the Inventor." J. F. Verruso. *Electronics World*, July and August, 1962. QST

Strays



Those who moan and groan about their ability to pass a higher grade of amateur license should take a lesson from K4ODS. Max Robinson, who is 25 years old, has won many awards. His doppler shift measurement device for satellite tracking won him first prize in the University of Florida engineering fair. He also was named "Outstanding Youth of Pinellas County (Florida)" and made the highest grade possible at the University of Florida Electrical Engineering School. Max will graduate (in the top ten of his class) from the five-year engineering course this year and will go on to study for his Master's Degree. Although he considers it incidental,

Max was born blind.



The above picture is a reproduction of W6ECM's QSL card that he attached to his c.w. DX competition log. Bud designed the card himself and, of course, made use of the amatuer radio commemorative stamp in his layout.

W3EKO (left) presents an unusual trophy (note the d.f. loop on top of the cab) to K3UHU, winner of the Delaware 6-Meter Net's hidden transmitter hunt held in April. The trophy was made by K3MPZ.

You and the Amateur Extra

Some Tips on the Top Level Exam

BY W. R. LATHROP, JR.*, W4PR

"Successfully passed the Extra, and thought a few tips on how to do it might be of interest. I have no technical background, but found that the study did me a world of good from the technical angle, and I suspect that it has made me a more competent operator. This, of course, is what FCC wishes." — W4PR

THE recent proposal from FCC, suggesting reallocation of certain parts of our amateur bands to amateurs holding better than General Class licenses, has already provoked millions of words of comment. Certainly millions more will flow out of our combined microphones and keys and into our combined receivers before the FCC finally comes up with new rules.

These proposals have rudely shocked into wakefulness a lethargic (on this subject only) amateur fraternity who sleepily continued to dream of a "status quo" arrangement for years to come despite positive signs of significant change. Why most of our number put the dismal thought of new rules, regulations, and new and more difficult examinations aside to "think about it tomorrow," as did Scarlet O'Hara in *Gone With the Wind*, I'll never know, for to me, and to many others, the handwriting was clearly on the wall when the League published its controversial RM-499. Furthermore, this famous document clearly prophesied the direction in which such a change would steer us. Now the FCC proposals, though not final by any means, make certain that there will be new rules and new regulations for all. Newly reserved frequencies are likely for those now qualified as Amateur Extras. In all probability new and more difficult examinations will be in order for those Generals wishing to avail themselves of such new frequencies. So regardless of all the "informed" rumors floating around our bands, hinting at lobbies and pressure groups and suggesting that eventually nothing will be done, it's apparent, I think, that some drastic changes will soon merge into formal law. Like it or not, therefore, most of our Generals and Conditionals must now squarely face the fact that they must soon take a new and harder examination if they want to have the full use of all our bands. I respectfully suggest that all Generals seriously consider taking and passing the Amateur Extra examination now and not wait for the new regulations to become law.

* 3000 Mountain Brook Parkway, Birmingham, Ala.

A Few Why's

Let me sum up quickly a few reasons for my recommendation. First, and I think it is one of the best, just because the Extra is *there* to be passed. Frankly, I have always been surprised that so few of our thousands upon thousands of competent Generals have never become Extras. I am fully aware, of course, that up until now that it has offered no special benefits. From my own nature I know all about procrastination. Yet even so, I am surprised because we amateurs are blessed with a generous supply of curiosity. Most of us are continually modifying, tearing down and rebuilding existing good equipment, selling, exchanging or buying new commercial equipment — curious to see if we can't squeeze a little more r.f. out of a different antenna system, a little more efficiency out of a linear, a little better quality out of our exciter, a little more sensitivity or selectivity out of our receiver. Again, many of us wear the seats out of our pants striving for a WAC, a DXCC or to maintain a high position on a DX honor roll. In other words, we are always looking for a new challenge. Thus, it seems to me that as curious as most of us are, searching for improvements continually as most of us do, looking for challenges of some sort as is usually the case, Generals by their very nature should flock to take and pass the Amateur Extra just because it is there waiting to be passed. To me, qualifying for an Extra Class license is a real achievement. By doing so, one wins the honor of tacking onto his wall the highest amateur license the government can award. So there is great

merit, I think, in passing this toughest and highest amateur examination for the personal satisfaction of proving to oneself that he is capable of doing so.

My second reason is quite obvious now in light of the FCC proposal — namely, that becoming an Extra in all probability will benefit a General in the eventual reallocations of frequencies. True, one can wait and perhaps take the new First Class examination proposed by the FCC and still have most of the benefits of the proposed frequency allocations. But when new regulations do become official, there will be a mad rush to upgrade. Imagine, if you will, the confusion, the crowds, the unavoidable delays in license issuance. Play it smart. As long as you have got to upgrade, why not go for the best and have it done with? So beat the rush and get your Extra now.

Third, I am certain, all arguments to the contrary, that by studying, sitting for and passing the Extra, the average General will benefit technically from the study necessary. He will actually become a better all-around amateur because of his increased proficiency.

Fourth and finally, I am sure that each new Extra will probably look more often for and enjoy on-the-air technical discussions a great deal more because he will be much more conversant with the subject matter.

The Examination Itself

The Extra examination consists, as well as I remember, of about 80 multiple choice questions. In addition, there were 10 questions calling for diagrams that you must actually draw in the space provided. There were no fill-in diagrams as on the General. You were required to draw the entire circuit requested. I remember calculating that the 80 questions must count a point each. The 10 diagrams, I figured, counted two points each, giving one a possible one hundred points. If I remember correctly, seventy-five points were required to pass. This, of course, is my own estimation of the grading system and it might not work this way at all.

The only way to pass Amateur Extra is to know the subject matter well. That's axiomatic. Well and good, but where is the material, on which the examination is based, found? I discovered that there is no one text which one can read from A to Z and be prepared. I found that if I wanted to study the material by text alone, I would have to read several different works on theory. The scope of the Extra contains questions on radar, microwave, radio-controlled model planes, f.m. receivers and transmitters, television, as well as the equipment used by amateurs today, and there was, I discovered, no single text covering this wide a background of technical nature.

There are, of course, question and answer manuals such as published by ARRL. These manuals, however, are not enough. I know! I memorized the answers to the questions given in these manuals. I knew the answers to every question proposed almost verbatim. Yet, I fell flat on my face the first time I sat for the Extra with this background. I will put it stronger! I don't believe the non-technical General could pass the Extra examination even though he had the open question and answer manual with him when sitting for the examination! One may well know the basic meaning of s.w.r., but try and work a problem concerning s.w.r. with r.f. current, feeder reactance and antenna resistance given. The answer printed in the Q & A manuals won't give you much of a clue.

Furthermore, the usual multiple choice questions on the examination give five suggested answers. Two sound right, but are obviously wrong to anyone knowing much about the question. One choice is close to right. Usually the two remaining choices are so nearly correct that the answer given for the subject question in the Q & A manual will not help you select the correct answer. A deeper understanding, whether from practical experience or learned theory, is usually necessary. The questions themselves on the examination, moreover, are usually worded quite differently than the pertinent question in the Q & A manual. Moreover, I have found that one had better read the question to himself very slowly at least twice. Before you jump to answer the question, be certain that you understand exactly what sort of an answer is wanted. The wording of the questions can be tricky. At any rate, it is most important.

Remember, too, that regardless of your reasoning near misses don't count. There is no professor there to give you credit for being almost right. Your answer sheet contains only the five numerical choices for the question. If you choose the wrong number through error because you misunderstood the question, regardless of the logic of your reasoning, you have missed the question. Finally, trite as it may sound, when you have finished, take an extra half-hour to go back over the examination and check your answers!

All of this makes the Extra sound quite difficult. It will be for the average General and perhaps even for the learned General unless he reviews before taking the examination. Even so, I have found out, for I'm average, that the average General can pass without too much trouble if he prepares well and rightly. Fortunately, the theory you think you have forgotten, particularly

if you have had years of experience as a General, comes back quickly with study. Moreover, if you do fail the first time, remember that you can take it again after one month.

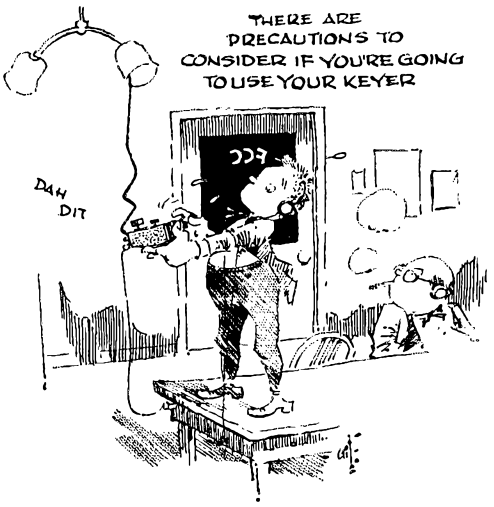
Some Tips on C.W.

Let's talk first about c.w. Twenty w.p.m. appears to many to be a formidable barrier to an Extra Class license — particularly to those who passed their General many years ago and have seldom used c.w. Not so! After all, you could copy 13 at one time. Bringing up an unused rusty 13 to a clean 20 w.p.m. naturally requires some work, but it is not as difficult as one might expect. Receiving speed will develop quite rapidly with systematic effort. I began by following the W1AW Code practice and by spending some time each day on the c.w. portion of the band copying stations working speeds at better than 20 w.p.m. One's code speed can be developed this way, but I found it slow. ARRL code sessions are hard to meet regularly. Moreover, the higher speeds are only sent every other day. Quite often QRM covers up the transmissions. Stations working better than 20 w.p.m. are hard to find when wanted. I therefore resorted to an Instructograph complete with high speed tapes.

There are many good machines on the market. Some can be bought or rented quite cheaply. The Instructograph is a fine one and, better still, it rents quite reasonably. A half an hour a day's work on this instrument will bring you up to and past 20 w.p.m. quickly. Murthermore, you will find it a lot of fun. Whether you like c.w. or not, you will soon find that you are eager to step up your speed. It will become more play than work and you'll end up quite proud of yourself when you can copy the required 20 w.p.m. and faster legibly and easily.

Receiving speed develops, as I have said, quite quickly. However, don't forget that you must be able to send 20 w.p.m. on the examination. I have heard time and time again that the sending is easy and it's receiving that is difficult! Don't you believe it. If you have laid off the key for many a year, you will find those muscles tight, that wrist stiff and your sending even at a reasonable speed almost unintelligible. I could rattle off a fast 20 on a straight key as a boy. I couldn't as a middle-aged man. Therefore, I shifted to an electronic keyer and I suggest that you do the same. It's fun to learn. It's easy to send. Once you send with it, once you have gotten the knack with practice, 20 w.p.m. becomes child's play. Moreover, sending practice in itself develops receiving speed. The Extra examination sends its 20 w.p.m. in clear text. I, therefore, took the morning's paper or a magazine and sent it word for word every chance I got during the day. I predict that the whole procedure — building your sending and receiving speed — will become fun, an interesting challenge, and you will soon do better than the required speed. I predict that you will have no difficulty with this part of the examination if you will work as I have outlined.

One final point! If you plan to use a bug or



electronic keyer on the examination, take it with you. They only furnish a straight key. If you use a keyer requiring an a.c. connection, I also suggest you carry along an extension cord. Sometimes the a.c. outlets are in such bizarre places that you end up sending in a difficult cramped position.

Study Tips

I suggest that you buy two copies of the ARRL *License Manual*. The reason will become apparent as soon as you read the manual. The questions and answer manuals are not in logical order: this makes the studying of them difficult, and at the same time makes review of the subject matter itself even harder. Buy the two ARRL guides and remove the pages with the questions thereon. Include the "General" material as well as the "Extra." Cut out each question with its answer. Reassemble in piles by categories. Paste all of the answers on oscillators on a sheet of paper, entitled "Oscillators." Repeat the procedure for all questions and answers on modulation, linears, antennas, etc. You will thus end up with your questions and answers grouped by subject matter. This involves a little extra effort, but it will be well worth it.

Now study the Q & A's by subject matter. Suppose, for example, you start with oscillators. Read the questions through and the answers. Then, turn to ARRL's *The Radio Amateur's Handbook* and study the chapter on oscillators for your background material. Pay particular attention to the handbook's do's and don't's and to the problems given and their solutions. Many of the Extra examination's questions are similar in nature to the problems given in the *Handbook*. Do this for each category of the questions and answers given in the guides. For FM, TV, etc., refer to any other basic text. I used two or three of the five-volume *Basic Radio* text written by Teppler. Finally, be sure and browse through the first few chapters, at least, of any good man-

(Continued on page 154)

High Claimed Scores

ARRL International DX Competition, 1965

THE incoming mails continue to bring us big and little scores from all parts of the world. As we approach our copy deadline we find the following scores a forerunner of the report to come — aiming for October *QST*. These claimed scores are uncorrected and show scores, multipliers and QSOs for c.w. scores over 200,000 and phone tallies over 100,000.

W/VE — C.W.

W6AM[1] 747,936-336- 742
W4KFC 690,642-306- 753
W8FGX 650,565-305- 711
W3GRF 648,000-300- 721
W2VJN 593,895-289- 685
W8VSK 556,140-299- 620
W3LOE 538,288-272- 674
W3BES 536,851-271- 661
W1BPW 521,451-267- 651
W3PZW 511,638-269- 634
W1JYH 464,508-253- 612
K1DIR 458,304-248- 616
W9IOP 433,485-247- 585
W1EVT 432,354-241- 638
K6EVR 429,250-250- 580
WA4NGO ... 422,968-236- 596
K2DCA 421,155-245- 573
W5LGG 387,299-257- 502
WA4OAE 385,200-225- 571
W2PCJ 354,164-232- 509
W3MFW 349,590-215- 542
WB2CKS 346,050-225- 516
W4MCM 343,335-235- 487
W9ERU 340,356-226- 505
W4BCV 334,614-217- 514
W5WZQ 331,975-245- 452
K4EZ 324,558-219- 494
WB2MFX 324,339-219- 495
WA2OJD 318,864-208- 511
K2GUN 309,444-214- 482
K8TIG[2] 302,247-213- 473
K3NHL 301,350-205- 490
K6OHJ[3] 288,420-209- 460
W5DWT 281,865-215- 439
W3IYE 274,800-200- 458
W3MSR 273,600-192- 475
W0YTQ 270,600-205- 442
W8ZJM 262,144-204- 412
W3MCG 261,660-196- 445
W1WLZ 257,277-191- 449
WA6QGW 241,680-190- 424
W4DXI 237,888-192- 415
W5CKY 235,710-194- 405
VE2NV 227,550-185- 410
W5BRR 227,290-191- 398
WA8CZH 224,466-179- 418
W8DGP 223,200-186- 400
W1WPO 221,613-173- 427
W2FVI 220,528-179- 412
W3BIP 218,400-182- 400
W2IRV 218,022-179- 406
W6LDD 217,953-183- 397
W2LXK 214,542-174- 436
W6KG 210,276-177- 396
W3KT 209,664-168- 416
W2HO 202,860-161- 420
K2CHQ 202,104-168- 402
W3MFJ 200,394-167- 398
W0AIH 200,025-175- 381

Multiple Operator

W3MSK 1,308,000-400-1090
W4KXV 1,040,763-361- 961
W3WJD 1,012,500-375- 900
K4LIQ 857,220-364- 785
W4BVV 754,924-316- 797
WB2APG 660,042-306- 719
W6RW 590,427-289- 681
W3VKD 576,080-264- 740
W6ITA 534,594-278- 641
W3WPG 474,240-247- 640
W3GHM 404,595-243- 555
K3JCT 360,591-223- 539
W8SH 353,901-223- 529
W3MWC 303,666-214- 473
W1ICP 255,780-196- 435
W4ZYQ 217,161-189- 421

W/VE — PHONE

Single Operator

K2HLB[4] 656,760-260- 842
W4BVV 501,739-229- 733
K1DIR 383,670-203- 630
W4RLS 353,584-196- 602
W4BCV 300,096-192- 521
W1JYH 286,812-186- 514
W3AZD 280,098-182- 513
WA6SBO 261,252-164- 535
W3BES 236,748-181- 436
WA4NGO ... 233,208-158- 492
W3TLN 232,323-161- 481
WB2MFX ... 227,675-175- 435
K3NHI 216,972-164- 441
W3LOE 209,745-177- 397
K8HIR 203,988-178- 382
W9EWC 197,505-167- 399
W4NJF 197,067-163- 404
K6SEN 194,535-165- 393
W3ZVJ 183,717-149- 411
VE2UX 172,050-150- 383
W4HKJ 168,969-151- 373
W3PZW 162,805-141- 385
W5KTR 160,038-153- 350
W3WPG 155,730-145- 358
K5MDX 154,548-162- 318
K4ZJF 150,192-149- 336
W4OM 149,319-141- 353
K6AHV 148,044-146- 338
W5LGG 140,715-159- 295
W4OPM 138,276-138- 334
W8DGP 137,256-152- 301
W6WX 133,575-137- 325
W6LDD 129,074-133- 326
W1RF 128,506-137- 321
VE3UX 127,872-128- 333
WA2IZS 121,806-136- 303
W1ZFV 121,632- 96- 428
W8JIN 121,176-153- 264
W3KFQ 121,125-125- 323
W1QAK 118,875-125- 317
W3ECR 117,000-130- 300
W6LCX 116,487-129- 301
W2EXH 114,945- 97- 395
K6ERV 114,680-122- 314
WA6EPQ 113,634-118- 321
W8BF 113,040-120- 314
W2GKZ 112,893-121- 311
WA8CZH 110,599-137- 269
K1RQE 110,166-122- 301
WA2OJD 108,288-128- 282
K5JZY 106,500-125- 284
K8UZA/4 ..... 105,984-128- 278
W5AJY 105,264-136- 258
W6LDA 104,532-124- 281
WA4ARV 102,660-118- 290

Multiple Operator

W3MSK 1,476,080-320-1548
K6EVR 556,200-225- 824
WB2APG 148,275-215- 691
W8NWO 425,412-234- 606
W6ITA 293,739-179- 547
W8NGO 266,064-184- 482
K6OHJ 190,650-155- 410
K3JCT 180,420-155- 388
W4ZYS 168,063-159- 360
W0QUU 137,241-153- 299
W3GHM 126,720-132- 320
W3IYE 102,300-124- 275

DX — C.W.

Single Operator

HP1IE 666,540- 84-2645
HI8XAL 612,128- 74-2758
YV1DP 588,840- 70-2804
VP2VL[5] 473,325- 75-2107
KG4AM[6] 454,656- 64-2368
YV5BKA 313,479- 61-1713
HB9JG 311,166- 59-1761
VK5ZP 307,758- 66-1561
GI3OQR 290,730- 55-1762
YB5BTK 276,396- 62-1486
OA1PF 272,160- 56-1638
PY2BGL 268,195- 57-1578
G4CP 259,400- 53-1699
VK2GW 245,676- 59-1388
PY2SO 228,904- 52-1469
JA1VX 202,076- 49-1389

Multiple Operator

EL2AE 501,732- 63-2678
KP4AXM ... 277,938- 54-1724
G6VC 229,680- 60-1276

DX — PHONE

Single Operator

HK3RQ 339,264- 62-1834
FG7XL 334,950- 66-1694
HI8XAL 334,908- 63-1772
HK4EB 331,931- 73-1519
OA4KY 317,238- 74-1429
KG4AM[5] 310,242- 58-1783
YV5AGD 269,640- 84-1070
PJ2CR 261,765- 63-1386
TG9EL 239,928- 52-1538
EA4GZ 232,800- 50-1552
DJ6QT 215,021- 53-1349
PY2BJO 213,237- 54-1247
HC1EW 172,830- 70- 823
HR9EB 133,218- 54- 830
HK3AFB 122,713- 41- 998
ZD8HL 114,750- 45- 850

Multiple Operator

IIRB 346,800- 60-1930
HC5CRC 331,520- 56-1979
KP4AXM 321,585- 55-2079
VP1GFQ 261,522- 58-1518
GB2DX 235,304- 48-1643
YV3KV 200,616- 62-1090
HK4RCA 181,436- 57-1053
GW3NWV ... 147,441- 49-1003
SM6BGG 133,200- 40-1108
SM6BCG 130,018- 37-1203

[1] W9WNV, opr. [2] W8CQN, opr. [3] K6VVA, opr. [4] W2VCZ, opr [5] W0NWX, opr. [6] K0UDQ, opr.

Strays

Amateur radio provided a helping hand at the 17th annual Air Meet and Conference of the National Intercollegiate Flying Association at the Purdue (Indiana) airport. Members of W9YB, the Purdue Amateur Station, set up a station atop a hanger at the FAA Tower site; WA9ELX was a mobile station on the runway with the judges, and W8DEE was at the dispatching tent. Although the weather was far from ideal, the group provided communications until the judges and advisers concurred, via 6 meters, that flying was no longer safe. WA9CSA and WA9DSK also participated in the activity.

—···—

This year's graduating class at Hamilton High School in Los Angeles had 15 hams and ex-hams in it: WA6LKU, WA6MRK, WA6PJF, WA6PJO, WA6WEJ, WB6ANP, WB6BZV, WB6EEP, WB6GDP, WB6GTP, WB6GVV, WB6MVS, ex-WN6EEQ, ex-WN6FQX, and ex-WN6JLL.

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* W1NJM

EMERGENCY LEADERSHIP

THERE is bound to be a great deal of organizational leadership among over 250,000 licensed amateurs. The trouble is that most of this kind of talent is tied up in other fields during normal times, and the organization and leadership of our amateur groups are left to whoever remains to do it. Sometimes this remainder is aces high, sometimes it is mediocre, and sometimes there just *is* no remainder. In any case, emergencies usually see the coming to the fore of leading intellects who are unable to restrain their leadership qualities even though they have not had the time to be active organizationwise. This sometimes leads to intra-amateur strife.

Come an emergency, it is a little embarrassing to turn down an offer of assistance from an engineer of a large manufacturing corporation or a professor of physics at the university, just because they have never lifted a finger in the preparedness program. In fact, if a local group is properly organized, there will be a place and a job for everybody to do regardless of previous training or experience. They are what military people callously refer to as "bodies" which, even without organizational training, can do such things as answer telephones, keep logs, service equipment, even run errands. They can, that is, and probably will, *if* the EC can bring himself to asking such menial services of people who occupy high positions on the "outside."

The point we are trying to make is this: The EC who knocks himself out during normal times to keep the local AREC unit going and to build it up into an effective emergency communications facility is not just keeping a chair warm for someone of superior ability who will make himself available when the need for his services is great enough. All local amateurs are responsible for, and in an emergency responsible *to*, the EC holding that job, no matter who or what he is. *Could be* that someone else could do a better job — but someone else isn't doing it, your EC is, or trying to, in the best way he knows how. If you "have the time" to assist him, that's fine. If not, then you ought to be prepared to do as you are asked to do without demurral if or when the time comes that an emergency arises of such gravity as to require your services, whoever you are. — *W1NJM.*

—•••—

The handling of third party message traffic by amateurs imposes on us a grave responsibility that *some* traffic-handling amateurs don't seem to take seriously. The responsibility is to the person for whom the message is being handled, to the amateur service itself in that a small piece of its "image" *is* placed in the handling station's care, and to the welfare of the general public in that the amateur is training himself to handle the message accurately, promptly and systematically. The irresponsible amateur who makes light of this aspect but is deeply concerned over his message count and consequently handles his traffic inaccurately, ineptly and takes a lot of unauthorized "short cuts" under the delusion that he is effecting a speedier delivery, is apt to project the opposite of the good public relations the service is intended, partially, to convey.

Let's take this responsibility seriously. Once you accept a message, regardless of the circumstances, it is your responsibility, on behalf of the amateur service, to relay it accurately, as soon as possible, to another station or deliver it to its destination by whatever means possible. Delivery to the wastebasket is tantamount to a heinous crime, committed against the good name of our service.

* National Emergency Coordinator

ARPSC Forum

W3AMR says that the following questions need answering:

Question: How long should nets be held in session if there is no traffic?

Answer: The rule stated in CD-24 is fifteen minutes for NTS nets. This can be a long time for a group of traffic men to sit around on their hands, and some net managers set a shorter time than this. A longer time should *not* be necessary; any net member who can't be in the net within fifteen minutes after it starts doesn't deserve to be a net member.

Question: How come most of the BPL totals listed for stations who make BPL on originations-plus-deliveries don't agree with their total traffic listed in "Station Activities"?

Answer: The BPL total shown is only the sum of originations and deliveries in this case. The other is the total of all traffic handled in all four categories. Of course if your total in all categories is 500 or over, your *complete* breakdown is shown in the BPL column and the total is the *same* as that in "Station Activities."

Question: Once in a while you see in BPL a breakdown showing more "relayed" or "delivered" than "received." This is a tip-off that the guy is cheating, right?

Answer: Nothing of the kind. It's probably an indication that he relayed or delivered some traffic that he did not receive. This can happen very easily when two traffic men are in touch by landline or in personal contact at work, through family relationship, etc. For example, many times I have received traffic that I have turned over to W1BDI, W1BGD or W1AW for relay; I got the received credits, they got the relayed credits. Similarly, if some other amateur delivers the traffic that you receive, *he* gets the deliveries, not you.

Diary of the AREC

An example of the effectiveness of amateur radio during emergency conditions was demonstrated in Indiana on Feb. 25, when snow paralyzed transportation throughout the state. At 1500z an Indiana emergency net was activated, and continued for six and one-half hours, with W9BDG, W9EGV and K9IVG as net controls. Over 200 check-ins from Indiana and surrounding states were logged. Net operation was orderly and effective in relaying road and airport conditions. Liaison with Red Cross stations and state police posts was obtained. Communications to some areas were relayed on six and two meters. Many communities were without power, and some stations checked in with emergency power. Information on lost aircraft, stranded motorists, food deliveries and health conditions was handled. — *W9YVX, SCM Indiana.*

—•••—

A heavy snow in Duluth, Minn. on Mar. 31 put the AREC into action to report road conditions during the peak rush hour. WAØDKP drove around the city and WØATO phoned the reports into the local radio station. WAØEDN also assisted in reporting road conditions to the radio station.

WA0s BWH BJY AWZ and CEL all stood by on the net frequency and acted as relay when needed. — *WA0EDN, EC Duluth, Minn.*

—•••—

An explosion caused by a faulty gas supply line wreaked much damage, injury and loss of life in LaSalle, Que., on Mar. 1. Members of the AREC went into action immediately, setting up mobile units at the scene of the disaster, the temporary welfare setup and the temporary morgue. Communication links were maintained with the local radio station and requests for ambulances, pumps, the handling of welfare traffic and requests for medical supplies were sent to the proper authorities. Walkie-talkies were used inside the buildings to maintain contact with a mobile unit stationed outside, and the mobile units were then able to relay any information to the control center. Fifteen amateurs participated.

—•••—

On Apr. 3, W6SGW/mm aboard the *Seaway* called W6MLZ on 20-meters and advised that he was disabled off Magdalena Bay and needed help. XE1PMC alerted the Naval attache in Mexico City, and WA6NKC called the coast guard at San Diego. W6MLZ called the FCC monitoring stations and requested that they take direction bearings. Later that evening, the FCC was able to get a Class C bearing, but because of poor conditions, a definite location couldn't be pinpointed. WA6UCR stayed on the frequency with W6SGW while the many other stations took a break for some sleep. A coast guard plane and gun boat started combing the area where the FCC reported that the *Seaway* might be, without success. At 2019z, a fishing boat stopped alongside W6SGW, gave his position and left some smoke bombs and dye markers. This information was reported to the coast guard and they immediately notified the searching plane and ship. Within three hours, the sea plane located the *Seaway*, marked the spot and the gun boat came alongside. The *Seaway* was then towed into port. Over the one day period of operation, over 200 stations porticipated in some fashion. — *W6MLZ.*

—•••—

When one of the main trunk lines of the New York Telephone Company was severed during the weekend of Apr. 10 in Schenectady, N. Y., communication assistance was provided by members of the 2-meter group of the Schenectady Emergency Corps directed by K2IOW. The break in the lines disrupted telephone service to the local maternity hospital and two of the other local hospitals were unable to contact many of the doctors. WB2FYP, WA2TAG and W2URP became liaison with the outside from the hospitals, while *W2s* EFU ODC EWY PKY, K2VCZ and WB2ICP were roving mobile units, delivering messages to the doctors as received from the hospitals. — *K2IOW, EC Schenectady, N. Y.*

Attention all VE's! This is your new National Emergency Coordinator. Murray Epstein, VE2AUU, present Section Emergency Coordinator for Quebec, has been appointed by Canadian Director VE3CJ to serve in this capacity. Following indoctrination, his duties will parallel, for Canada, those of W1NJM for the U.S. Murray has already organized a Trans-Canada ARPSC Net consisting of Canadian ECS, and SECs, which operates on 14,140 kc. on Sundays at 1800 GMT, with two net controls, one on each coast.

—•••—

On Apr. 14, WB2FXB, NCS of the Westchester Co., N. Y., AREC net heard an urgent request by one of the local radio stations for a particular type of blood that was needed at a local hospital so that a patient could undergo emergency surgery. WB2FXB relayed this request to the members of the net and K2YRZ notified NCS that he had this type of blood and would go directly to the hospital. Nine other amateurs participated in the communications. — *WB2FXB.*

—•••—

K7PBM and K7UCH were in contact on Apr. 19 when YN1LC broke and asked if Doc, K7PBM was a medical doctor. K7PBM replied that he was, and YN1LC told him that he was also a doctor, and had been trying to get an emergency supply of a particular drug, but with no success. K7PBM called the drug controller at the hospital where he has his practice while YN1LC was giving shipping directions to K7UCH. The drug was available, and after going through customs, the drug was transported to YN1LC by jet. — *K7UCH.*

—•••—

At 2015z, May 3, WA8CKN/mobile was stopped by a volunteer fireman at the scene of a forest fire near Dellslow, W. Va., and was asked to provide communications to the Sheriff's office in Morgantown. WA8CKN called WA8KMZ who called WA8IMY. W8RXO started the AREC net and WA8IMY and WA8CKN proceeded to the fire where they both set up at strategic positions and relayed reports to either the Sheriff's office or the local radio station. Another mobile unit was needed at the fire, so W8RXO turned net control over to WA8MRN and proceeded to the fire himself. By 0330z, May 4, the fire was brought under control and the net was secured. Other stations participating were *W8s* GUL ETE, *K8s* AXU UKV QAL LOU QKC, W2VRN. — *WA8IMY, Asst. EC Monongalia Co., W. Va.*

—•••—

While driving on Interstate Highway 15 on May 4, K7ZOK came upon an auto accident. He immediately put out an emergency call that was answered by WA6PKN/mobile near Oakland, Calif., who called the highway patrol. W6VX, WA6MOV and *WB6s* HZZ KQJ assisted by relaying necessary information to the highway patrol from K7ZOK. — *W7PBV, SCM Nevada.*

—•••—

While on his way home, K1LMS witnessed a collision in Groton, Conn. He immediately called for assistance on the local AREC frequency, and was answered by W1LCJ who called the state police. The police arrived within five minutes after the call, and K1LMS continued on his way home. — *K1LMS.*

—•••—

Forty SECs decided to report for March, representing 19,230 AREC members. This is five more reports and almost 3,000 more AREC members than last year at this time. Keep it up fellers. Those sections reporting were N.N.J., Tenn., N. C., Ind., Iowa, N. Y. C.-L. I., Los. A., R. I., Alta., Mont., Sask., E. Pa. B. C., Man., La., W. N. Y., Del., E. Mass., W. Pa., Ariz., W. Fla., Wyo., Wisc., Maine, Mich., Ala., E. Fla., Wash., Nev., Ohio, Utah, Minn., Mo., Ark., W. Va., S. Tex., Va., Colo., S. Dak., Okla.

RACES News

What began as a routine RACES exercise for operators in the Borough of Queens, N. Y., developed into an actual communications emergency. On Feb. 13, a mobilization drill was in progress when a call was received via telephone from the coordinator of a Civil Aeronautics Board team investigating the crash of a commercial air liner off Long Island in which 84 people were lost. The CAB team wanted to set up a radio link between their headquarters at a motel near Kennedy Airport and the Coast Guard ship at the scene of the wreck. W2QTQ, Queens Radio Officer who was conducting the drill deployed participating mobiles to a point midway

between Kennedy and Jones Beach, where the coast guard had a station, and alerted fixed stations. Two-meter equipment at the control station was broken down into two complete units and loaded on city trucks, which proceeded to the motel where one station was installed; the other unit was taken to the coast guard station at Jones Beach, where it went on board a picket boat for transfer to a cutter. A team of RACES personnel went along for installation and operation. The RACES operators handled traffic between the CAB man on the cutter and the CAB team leader at the motel. Operations continued that night and through Sunday. On Monday, the RACES equipment and personnel were transferred to a submarine rescue ship.

During the following weeks, the program settled down to a steady daytime and week-end schedule. Several RACES members who hold night jobs took on responsibility for communications activity during the daytime and all pitched in on week-ends. The operation continued until Mar. 13, when the sea-borne phase of the search ended. Amateurs participating were: *WB2s* CMD DCU IPO, *WA2s* PWP SOX, K2DZO, *W2s* HDV YVR, WN2MGK. — *K2IDB, SEC N.Y.C.-L.I.*

—•••—

On Apr. 19, the South Jefferson Co., Texas, RACES went on alert to report severe weather conditions. W5APX and WA5DUG manned the c.d. control center and read advisory bulletins from the weather bureau. WA5HGH/5 reported two funnel clouds in Port Arthur but neither touched down. K5ZCU reported that the winds in Beaumont were dying down. K5HBU relayed a report from WA5KAS that a ship at Port Neches had broken loose from its moorings. Stations at two hospitals joined the net, but no emergency situation developed and the net was closed two hours after operations began. Twenty-nine amateurs participated. — *WA5DUG.*

—•••—

One RACES group that is still super-active is that of Hillsborough County (Tampa), Florida. A copy of their newsletter from Communications Chief W4BNE indicates that six nets are active in a comprehensive plan of organization involving RACES segments in five amateur bands. All nets are centralized at the c.d. control center and operated through command networks on two and six meters. An alternate (remote) control center is located in one of Tampa's suburbs. Capability exists for effective county, inter-county, state area and statewide communication, in addition to national tie-ins. We salute the Hillsborough County RACES organization.

National Traffic System

One of the shortcomings of an effective ARPSC, demonstrated in the last two SETs, is that a surprising number of AREC people, including SECs and ECs, fail to appreciate the value of the NTS as a record message system; a few, we might add, are totally ignorant of its very existence. This situation will not correct itself, it is binding on the informed to lead the uninformed. We therefore suggest and urge that all NTS people at all levels commence immediately to enlighten the local emergency arm of our ARPSC. Contact your EC, SEC and SCM, let them know you have a going thing. Have the SEC contact his ECs via your section net and let all and sundry know you provide a reliable tie-in with a national service. You will then have done a service to your NTS and the AREC; most of all, though, you will have shown that there is indeed an ARPSC. — *W4SHJ.*

April reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	58	508	.403	8.8	92.2
2RN	60	770	.816	12.8	99.7
3RN	60	889	.565	14.8	100
4RN	52	896	.570	17.2	97.0
RN5	60	1526	.493	25.4	96.0
RN6	60	854	.562	14.2	95.8
RN7	30	741	.594	24.7	83.5[1]
8RN	60	431	.331	7.2	83.9
9RN	30	665	.683	22.2	97.5[1]
TEN	60	803	.524	13.4	82.1
EAN	30	1987	1.322	66.2	99.4[1]
CAN	30	1999	1.246	66.6	100
PAN	30	1744	1.179	58.1	100
Sections[2]	1782	14,606			
TCC Eastern	120[3]	1023			
TCC Central	90[3]	1504			
TCC Pacific	120[3]	1323			
Totals	2131	32,465	EAN	11.8	3RN CAN PAN
Records	2075	27,780	1.061	17.8	100

[1] Representation based on one or less sessions per day.

[2] Section nets reporting (61): NJN, NJNN (N. J.); TSN, PTN, TN, TSSBN, ETPN (Tenn.); OZK (Ark.); WFPN, QFN, FAST, Gator, FPTN, FMTN, TPTN (Fla.); EPA, PTTN, PFN (Penna.); NCN, SCN, SCVSN (Calif.); WSBN, WIN (Wis.); NCNL, NCCW, THEN (N. C.); OQN (Ont.-Que.); NLI, NYCLIVHF, NLS (N. Y. C.-L. I.); BEN, OSSBN (Ohio); AENB, AENH, AENM, AENP, AENP (eve.), AENR, AENT (Ala.); VSN, VSBN, VSBN (eve.) (Va.); SCEN, SCCW (S. C.); ILN (Ill.); VTNH (Vt.-N. H.); MTN (Man.); MDD, MDDS (Md.-Del.-D. C.); BUN (Utah); RIN, RISPN (R. I.); CN, CPN (Conn.); QMN, MWN (Mich.); MSPN, MSPN (eve.), MSN, MJN (Minn.); NTTN (Texas).

[3] TCC functions not counted as net sessions.

What a month! We broke the sessions, traffic and rate records, and 61 section net reports. The representation in all but three higher level nets continues to stay above the 90% mark. With all these fine accomplishments we shouldn't stop, but keep striving to improve our system in any area that seems to be weak. Keep it up fellows and gals.

We seem to be a little low on comments from net managers. W1BVR reports that E. Mass. had perfect attendance with R. I. and W. Mass. right behind. K3MVO comments that the rate and traffic totals have improved and he hopes that the 100% representation will be the rule rather than the exception. WB6BBO has moved to a new QTH, and comments that traffic and rate seem to be down a bit. RN7 showed another increase this month in most departments, and K7JHA thanks Wash., Ore. and Idaho for their 100% representation. W8CHT sez that with the return of the school gang, things seem to be perking up a bit (gad, is it that time already?). Tornadoes added some traffic to 9RN, but W9QLW sez that if this is the only way they can get traffic, he would rather do without. WØLGG issued a TEN certificate to WAØIIJ and reports that the QRN is increasing. K1WJD has issued EAN certificates to W1ZFM and W4PNM. W9DYG reports the highest month CAN has had in a long time and notes that they are nearing a year of 100% representation. WB6JUH feels that the representation problem on PAN is just about licked.

Transcontinental Corps: W3EML sez that all functions are now filled; the first time since he took over as TCC Director. W5PPE *sends his report from Mexico where he is* enjoying a stop over on his way to Argentina on business and pleasure. W4ZJY is collecting reports until Jim gets back.

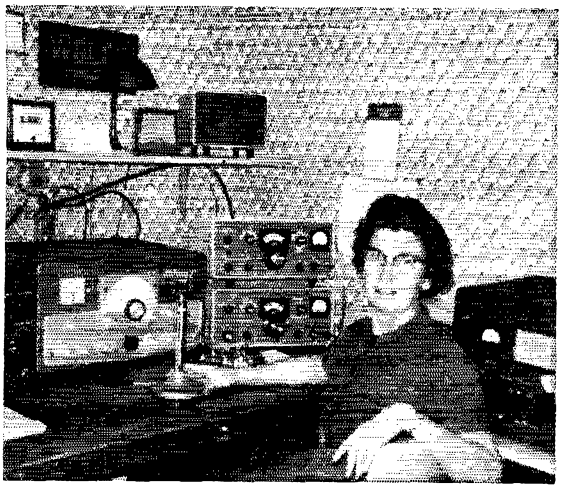
April report:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	120	89.1	2711	1023
Central	90	92.2	2992	1504
Pacific	120	88.3	2616	2323
Summary	330	89.7	8319	3850

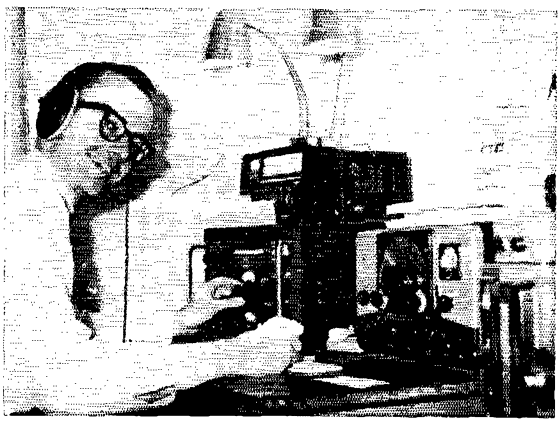
TCC roster: Eastern Area (W3EML, Dir.) — *W1s* BGD EMG NJM, WA1CRK, W2GVH, *WA2s* BLV RUE, WB2HWB, *W3s* EML NEM, *K3s* FHR MVO, W4DVT, K4VLK, WA4PDS, W8CHT, *K8s* KMQ NJW. Central Area (W5PPE, Dir.) — *W4s* OGG ZJY, WA4AVM, W5PPE, *W9s* CXY DYG JOZ VAY ZYK, *WA9s* AUM BWY, WØOHJ, KØGSY.

Net reports:

Net	*Sessions*	*Check-ins*	*Traffic*
7290	50	1403	727
CNEN	26	773	5
Northeast Area Barnyard	26	627	5
75 Meter Interstate	30	1409	1687
North American SSB	26	901	789
20 Meter SSB	22	689	1866
EASN	31	235	128
HBN	30	435	560



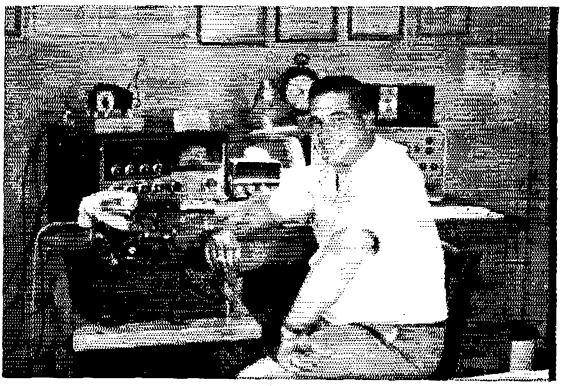
(1)



(2)

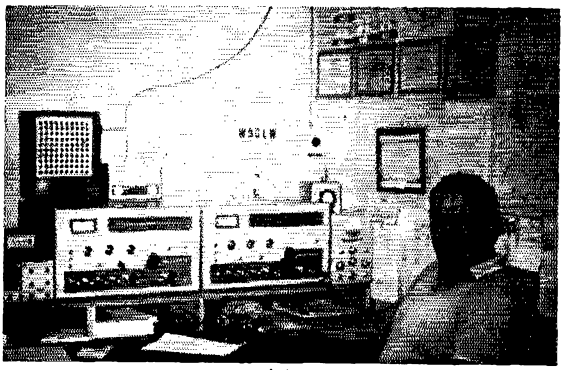
(3)

The above are all high-level NTS managers. How many of them can you identify? See page 162 for answers.



(4)

(5)



(6)

(7)

NET REGISTRATION INFO

In keeping with our plan to have the Net Directory available earlier, we are moving the deadline for net registrations up to Aug. 1. This will be the deadline from now on, and will enable us (we hope) to produce the Net Directory in time to meet the start of the Fall operating season.

Take a look at your copy of the 1964 directory. You will note that column 9 contains the date on which the net was last registered prior to the compilation of the directory information. If this date was before Aug. 1, 1964, and no new registration has been submitted subsequent to that date, your net *will not* appear in the new directory unless it is registered prior to Aug. 1, 1965. On the other hand, if the registration date is *after* Aug. 1, 1964, and no changes have been made, please *do not* register at this time. We have notified all nets whose registration has expired that they will not appear in the new directory unless we receive a current registration. If you have received such a card, and your net is active, please *do* register prior to Aug. 1, or your net will be dropped from the listing.

In keeping with the new policy regarding the NCEFs, we will *not* register any net that meets on any of the *full time* calling frequencies, or within their respective guard bands.

Use CD-85 (available from ARRL) or facsimile, or give us the information listed below. Even if you do use CD-85, refer to the data below for explanation of exactly what we need. *Incorrect or sloppy registrations waste both your time and ours and may result in your net appearing incorrectly or not at all.* Only nets rendering a public service are eligible for registration.

1. *Name of Net.* On the top line (two lines if you need them) of CD-85, write the name of your net *exactly* as you wish it to appear in the net directory. Do not write, in this space, anything you do *not* wish to appear in the name. Although two lines are provided, we have found that the best nets are those with short, concise names.

2. *Net designation.* This is optional. Many nets, especially c.w. nets, have designations used in the net call-up that are useful net directory data. If you have one, let us in on it. Examples are QMN for Michigan Traffic Nets and NYS for New York State Net, etc.

3. *Frequency*, or frequencies in kc. If your net operates on more than one frequency, be sure to include both or all and correlate them with days and times. Frequency bands or segments are not sufficient.

4. *Call of Net Manager.* Just his call letters, that's all. If no official with that title, give us the call of the amateur from whom further information on the net may be obtained.

5. *Days.* Tell us *which* days of the week, not how many or "All." If not properly entered, this may disqualify your net from registration. "Daily" means *every* day, including Sunday. Make sure the days given are in accordance with the time used; that is, don't give the days according to local time, then give the time in GMT. We suspect a great many registrants have done just this.

6. *Net starting time*(s) and ending time (s). All nets are registered in *Greenwich Mean Time* (GMT), otherwise known as "zulu" or "zebra" time. If you don't know how to convert (shame on you), use your local time, but be sure to let us know *what time zone* that is. "Local time" means absolutely nothing. If your net operates an hour earlier six months of the year (*i.e.*," daylight saving" time), put an asterisk after your operating time so this can be included in the net directory.

7. *Direct Coverage.* The coverage area assigned the net (if part of a system) or the coverage provided by *regular* participants. Do *not* include coverage provided through liaison with other nets. Do not put down such meaningless phrases as "50-mile radius" unless you also give us the center of the circle it's radius of.

8. *Purpose of Net.* Please, not a lecture, just a one or two word description. Does the net fall in the category of an emergency net (E), a traffic net (T), or both (ET), or some special purpose (S)? If the latter, be sure to indicate *what* special purpose. Don't say "training" unless you indicate training *in what.*

9. *NTS?* Indicate whether or not your net is a part of the ARRL National Traffic System. If you don't know, it probably isn't.

10. *Liaisons.* NTS nets indicate their NTS liaison net; other nets may indicate any nets with which they conduct *regular* liaison.

11. *Previously registered.* Give us your latest registration date, if you know it. If not, the year. If you don't know the year, just say yes. Of course, if this is a newly formed net it will save us some searching if you just say no.

12. Give us your call letters. If you have more than one call, give us the one by which you are best known. This makes you responsible for all the information in the registration. Unauthenticated registrations will not be entered.

Don't forget, **August 1** is the deadline. On that date we start compiling the net directory, and we hope to have it in distribution by **September 1.** This is the date when we will be distributing the directory from now on, when it is most needed. Please get those registration cards in early.

—W1BGD.

QST

Strays

Wonder why you don't get 100-percent return on your QSLs? EI9J reports that although he QSLs 100 percent, it is not unusual for him to receive invalid IRCs due to carelessness of the sender. Sometimes the coupon isn't even stamped by the office of issue. More often, the stamp of the office of issue is placed in the wrong spot on the coupon. It is suggested that all those sending IRCs make a special effort to check the coupons and make sure they are correctly stamped.

—•••—

K9HXX sent in this riddle: What do hams have in common with veterinarians? They both look for Dog X-rays!

Stolen Equipment

The following equipment was stolen the morning of May 19. Drake TR-3, serial 33026, matching a.c. power supply and speaker; Elmac PMR-8 receiver, serial 10056, AF-68 transmitter, serial 10364, matching power supply and Astatic 331 microphone; and a Hallicrafters S-94 receiver, serial 940200 in a gray cabinet. A floor fan and some firearms were also stolen. Anyone with information should contact Everett Coffey, K4APV, P.O. Buchanan, Virginia 24066, Tel. 254-1127.

First-Day Covers Still Available

When the Amateur Radio First-Day Covers were processed in Anchorage on December 15, we gambled and had a few extra unaddressed covers prepared, because orders for the first-day covers were still coming in and we didn't want anyone to be disappointed. We still have some of these left. They are all singles, unaddressed but carrying the amateur radio stamp and the official first-day cancellation, and they will be mailed to you in an envelope. Prices are 35c each, three for a dollar. Send your orders to ARRL Hq., 225 Main Street, Newington, Conn., 06111.

Hamfest Calendar

Alberta — The 31st International Waterton Glacier Hamfest will be held July 17 and 18, at Waterton Lakes Par, Waterton, Alberta, Canada. The preregistration fee is $3.00 (until July 7) Write to the Hamfest Committee, Box 223, Red Deer, Alberta, Canada.

Arizona — The annual hamfest of the Arizona Amateur Radio Council will be held on July 31 and August 1, at the Coconino County Fairgrounds, Flagstaff, Arizona. For details, contact K7VOR, 5040 N. 13th Ave., Phoenix, Arizona.

British Columbia — The OK Hamfest this year will be on July 31 and August 1 at the OK Falls.

British Columbia — The British Columbia Amateur Radio Association Picnic is Sunday, August 22 at Bear Creek Park, Surrey.

British Columbia — The Orchard City Amateur Radio Club of Kelowna, B.C. will sponsor the 1965 Okanagan International Hamfest. It will be held at the Dolly Varden Auto Court in Okanagan Falls, B.C. on July 31 and August 1. Motels, trailer and tenting space is available in the area. Admission for Licensed Hams is $1.50 plus one piece of Ham "junk." Unlicensed, XYL or YL 50¢ harmonics free. Registration starts at 1:00 P.M. Saturday, July 31. For further information contact Leo Rimmer, VE7BMB, 2130 Ethel St., Kelowna, B.C., Canada.

California — The 9th Annual San Fernando Valley Radio Club Hamfest-Picnic will be held on July 11, at the Sunset Farms in Sylmar, California. This will be a family affair, plenty of parking, picnic tables, sports events, transmitter hunts, MARS exhibits, displays and contests. Adult admission is one dollar, children under twelve, 75¢. Calling frequencies will be 146.25 Mc., 51.0 Mc., and 3.870 Mc.

Colorado — The South Fork Hamboree will be June, 4, 5, and 6 at Moon Valley Lodge, South Fork, Colorado. Write Jim Jennings, KØKUP for details.

Illinois — The Piatt County Radio Amateurs Club is sponsoring a Ham Picnic at the 4-H Camp in Allerton Park, Monticello, Illinois, July 18. All radio amateurs and visitors are welcome. No admission will be charged.

Illinois — The annual Bowling Green, Missouri Hamfest has been transferred to Jacksonville Area Amateur Radio Club Hamfest at the Morgan County Fair Grounds, Sunday July 11, Jacksonville, Illinois.

Illinois — On Sunday, August 8, The Hamfester Radio Club will hold their 31st Annual Mid-Western Picnic and Hamfest at Santa Fe Park. For additional details, write William Spars, WA9FXH, 6035 South Spaulding Ave., Chicago, Illinois 60629.

Illinois — The Six Meter Club of Chicago will hold its eighth annual picnic and hamfest on Sunday, August 1, at Picnic Grove on Route 45, one mile north of Route 30, Franfort, Illinois. For information write Jack Hellwig, K9ZWU, 3420 So. 60th Court, Cicero, Illinois 60650.

Illinois — The Quad-Co. Amateur Radio Club, Inc., will sponsor the 8th annual Hamfest of the Breakfast Club on July 17 and 18 at Terry Park, ¾ mile east of Palmyra. All other groups are invited, but please give advance notice to the Hamfest Committee. There will be dancing and movies Saturday night. Bring your own basket lunch, sandwiches and soft drinks available on the grounds. Mobile talk-in frequency is 3.873 Mc. from noon Saturday. Camping facilities open from Friday afternoon until Monday morning. Preregistration until July 8 is $1.50. Price is $2.00 at the gate. Write Hamfest, Quad-Co. ARC, Inc., Box 323, Chatham, Illinois.

Indiana — The Indiana Radio Club Council, Inc., will hold its annual Hamfest and Family Picnic on July 11. The site of this year's Hamfest will be Brown County State Park, near Nashville, Indiana.

Indiana — The Wabash Valley ARA presents the annual V.h.f. Picnic, Sunday July 25, at Turkey Run State Park, about 40 miles north of Terre Haute, on U.S. 41 and Ind. 47. One dollar registration at the gate only. Full day's events scheduled. Contact K9WHE.

Maryland — The Sixth Annual Hamfest and Banquet of the B & O RR ARC will be held on Saturday, July 17 at the Arbutus Community Association, Inc., Town Hall, Arbutus, Md. Advance reservations are $3.50, or $4.00 at the door. For more information contact Joseph W. Zerzie, W3LBC, 7388 B & O Bldg., Baltimore, Md. 21201.

Michigan — The Bay De Noc Amateur Radio Club will host the 1965 Upper Penninsula of Michigan Hamfest this year. The affair will be held July 31 and August 1 in Escanaba, Michigan, at the 4-H Building. For information, write Tom Elegeert, 1403 South 13th St., Escanaba, Michigan.

Michigan — The 12th Annual V.h.f. picnic is August 1 at Allegan State Park.

Michigan — The annual Hair Net and Teenage Net picnic, combined with the Calhoun County Radio Club Swapfest is to be held at Charlton County Park on July 23 and 24. The park is four miles east of Hastings, Michigan, through Quimby on M79, then one-half mile north on County Road, on the north side of Thornapple River. Tent and trailer sites, swimming, boat launch, etc., are available. All hams with their families are invited. Contact R. S. Oldfield, 1011 Burr Oak St., Albion, Michigan.

Minnesota — The OGS picnic will be held at Gunn Park at Grand Rapids on July 11.

Minnesota — The Piconet picnic will be held at Austin on July 20.

Minnesota — The Mankato Amateur Radio Club will have their picnic at the Blue Earth County Fair Grounds, July 27.

Mississippi — The annual Hamfest of the Jackson Amateur Radio Club will be held Sunday, July 25, from 9 A.M. to 4 P.M. at the Mississippi Fairgrounds in downtown Jackson. A supper will be held on Saturday night, July 24, at the Green Derby Restaurant on highway 80 west. For information write Ross Hutchinson, 270 Lea Circle, Jackson, Mississippi 39204.

Montana — The Old Faithful Radio Club will hold its annual picnic on July 11 at the Battle Ridge Camp Ground.

Nebraska — The Central Nebr. Amateur Radio Club Annual Steak Fry will be at the Victoria Springs State Park on Sunday July 25. Information and registrations from Harry Roblyer, W9OLM, Box 492, Burwell, Nebraska.

New Brunswick — Remember the International Ham Picnic, St. Stephen, New Brunswick, July 4.

New Jersey — The Gloucester County Amateur Radio Club is holding its annual Hamfest on Sunday July 25, at Crystal Birch Lake, Chapel Heights, near Pitman in Southern New Jersey.

New York — The Southwestern New York Very High Frequency Association will hold its seventh annual Field Day and Picnic on July 17 and 18 at Great Valley Fire Tower near Great Valley, New York. The club station, WB2GXE, will operate on six and two meters to guide mobiles to the site. Watch for the VHF signs posted to lead the way to the fire tower.

New York — The annual picnic of the North Country Radio Club will be held Sunday, July 11 at the Norfolk Rod and Gun Club. Registration fee will be a "piece of junk" or one dollar. Ladies and children no charge. The program includes a "junk" auction and a guessing contest. Information from WA2HEC, Box 475, Norfolk, New York.

Ohio — The Springfield Amateur Radio Club of Springfield, Ohio will hold its second annual Hamfest, under shelter, at the Clark County Fairgrounds, Sunday July 18. There will be a Swap and Shop and a lecture on ATV by K8AOH. A program for the XYLs and kiddies is also planned. Information from WA8FZS, 212 Galewood Drive, New Carlisle, Ohio 45344.

Pennsylvania — The Two Rivers Amateur Radio Club of McKeesport, Pa. is having their hamfest July 18 at the Balkan Hotel, 801 Coulter Rd., McKeesport, Pa. There will be Registration prizes, Swap and Shop, refreshments, family picnic, games, and fun for all. For information write Zip, W3MIW, 1005 Clydesdale Ave. Greenock Heights, McKeesport, Pa.

Pennsylvania — The EPA C.W. Net and the PTTN will sponsor an Eastern Pennsylvania Traffickers Picnic on July 25. For details contact W3EML.

Pennsylvania — The 10th annual Grave Yard Net Picnic and Hamfest, sponsored by the Somerset County ARC, Inc., will be held at Lake Stonycreek, near Somerset, Pa. on Saturday, July 10 and 11. W3GGN, the club station, will be on 3.885 Mc. and 50.4 Mc. to direct mobiles to the site. Registrations in advance, $1.50, $2.00 at the gate. For information and advance tickets contact Blaine, K3BGI, 510 Broadway, Rockwood, Pennsylvania 15557.

Quebec — IMPORTANT, the dates of the RAQI summer convention have been advanced one week to July 16-18. The convention will be held at Louisville.

(Continued on page 160)

Hints and Kinks For the Experimenter

VOLTAGE REGULATION?

IN *QST* for October, 1964, K6UGA shows there is a good deal more to VR-tube characteristics than one often thinks, and the same goes for Zener diodes. It is dangerous to take these devices for granted. An effect which puzzled me for a few hours concerns the *worsening* of the voltage/frequency coefficient of a v.f.o. due to the introduction of a Zener diode. I had constructed a 1.7-Mc. transistor v.f.o. and had succeeded in getting this to function within 200–300 c.p.s. with a variable power supply from 16 volts all the way down to 2 volts. Thus the addition of a Zener diode represented a bit of lily painting but was thought worthwhile for mobile operation.

You can imagine my surprise when I found that the situation got violently worse with a Zener. A check showed the voltage remained constant at 9 volts, when the supply was varied from 16 to 11 volts, but the frequency changed several kc.

After some thought I came to the conclusion that the Zener diode, whose impedance is both quite low and distinctly variable with voltage, was acting as a variable shunt across the 0.1-μf. bypass used to complete the collector return path. There may also have been some variable capacitance with change of current, but this would have been quite small compared with the 0.1 μf. The reactance of a 0.01-μf. disk on 1.7 Mc. is about 1 ohm, which is not by any means low enough to allow one to ignore the impedance of the Zener diode which can be as low as 5 ohms.

My solution was to separate the diode from the bypass capacitor by a small r.f. choke, which removes the variable Zener impedance from the r.f. path. — *Reg Hammans, G2IG*, from RSGB Bulletin

HEATH SB-400

OWNERS of the Heath SB-400 who want full break-in without keying the VOX relay can make this simple modification. Remove the yellow lead from Pin 3 of MS1F. Install a 14,000-ohm resistor from Pin 5 of V12. to Pin C of MS1F. When the transmitter is put in the c.w. position the VOX relay will close and stay closed, but will act normally when using s.s.b. It will be necessary to use a separate antenna when operating c.w. — *W1BGD*

KEY BASE

I USE the bottom portion of an old electric flat-iron, smooth side up, as a base for my transmitting hand key. The heavy weight, plus three rubber feet attached to the base, give the combination "stay-put" stability, and it looks good, too! — *H. C. Nenstiehl, W2EAT*

BREAK-IN PLUS SIDETONE

THE addition shown in Fig. 1 to the c.w. break-in muting system described in recent *Handbooks* provides a sidetone as an added feature. Key-down creates a positive voltage across R_1. This voltage is sufficient to trigger a simple neon-bulb oscillator whose output is fed to the first audio stage. Key-up shorts out R_1, which cuts off the sidetone and restores normal gain in the receiver. Varying R_1 changes the frequency of the oscillator, but not the volume. The receiver at W6ZGM is homemade, but the circuit should be adaptable to practically any receiver, with possible minor modifications in the values of R_1, R_2, R_3, and C_1. This circuit tends to swamp out transient clicks in the receiver caused by breaking the voltage across R_1. — *Donald F. Meadows, W6ZGM*

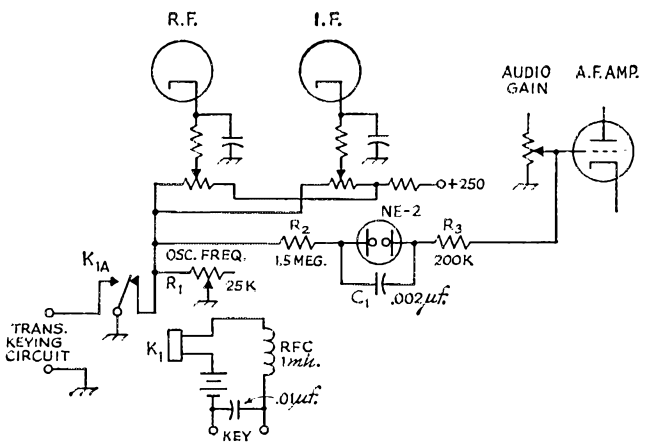


Fig. 1 — Circuit diagram of the changes to add a sidetone to the *Handbook* break-in circuit, R_1 is a 25,000-ohm linear taper control, and K_1 is a keying relay with a d.c. coil to match the battery voltage used (Sigma 41FZ-35-ACS-SIL or equivalent).

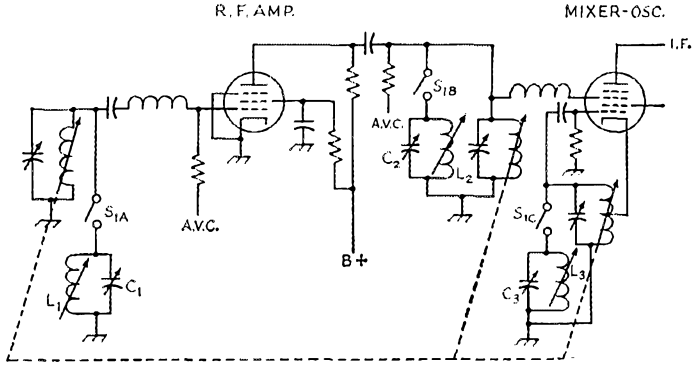


Fig. 2—Diagram of the converted auto receiver. Unmarked components are parts of the original circuitry.

C_1, C_2, C_3—7–150-pf. trimmers.
L_1—18 turns No. 26 enam., close-wound on ¼-inch diam., slug-tuned form.
L_2—30 turns No. 28 enam., close-wound on ¼-inch diam., slug-tuned form.
L_3—10 turns No. 26 enam., close-wound on ¼-inch diam., slug-tuned form.
S_1—3-pole, single-throw rotary or lever-action switch.

3.5-MC. AUTO-RADIO CONVERSION

THE problem of finding an inexpensive mobile converter was solved by modifying an auto receiver to tune 3.5–4 Mc. If your car is equipped with a good broadcast receiver (with an r.f. stage), it can be made to work on 75 meters by switching in additional coils in parallel with the r.f. and mixer-oscillator stages as shown in Fig. 2.

Mount the slug-tuned coils (L_1, L_2, L_3) near the permeability-tuned coils of the auto receiver. Because only one end of each coil must be switched, a 3-pole, single-throw rotary or lever-action switch is required. The additional padding trimmers, C_1, C_2 and C_3, are adjusted with the slug-tuned coils for proper tracking. A grid-dip meter is a help in making initial adjustments.

An oscillating i.f. stage is used for a b.f.o. The addition of the b.f.o. requires disabling the a.g.c. when the b.f.o. is on, so a switch was fastened at the rear of the b.f.o. control. Most of this series of auto receivers have two large-diameter studs that project through the chrome mounting plate. These were drilled to take the switch and b.f.o. control shafts, thus no holes are required in the mounting plate.

Because of the cramped quarters in most receivers, some space has to be gained somewhere. The rectifier tube was replaced by silicon diodes, and the audio output transformer mounted on the side of the case, giving enough space for the modifications. — *Hamilton Amateur Radio Club Bulletin*

V.F.O. DRIFT MEASUREMENT

WANTING to check the drift of a v.f.o., I lacked an audio signal generator for making determinations of the beat frequencies between the v.f.o. and a 100-kc. standard. I recalled Lissajous figures and decided to utilize the Philadelphia Electric 60-cycle power as a standard of comparison. In these times, power companies hold frequency to relatively close limits and the 60 cycles is usually good to better than 0.5 per cent.

The block diagram, Fig. 3, shows the layout for the test. The 36th harmonic of the 100-kc. oscillator and the 3600-kc. signal from the v.f.o. are fed into the receiver. The resultant audio signal is taken from a resistor across the 500-ohm output taps, and applied to the vertical plates of a scope. About 50 volts is fed to the horizontal plates, using a step-down transformer connected to the power line.

The 100-kc. standard was warmed up for an hour and checked against WWV. At time "zero," the v.f.o. was fired up and the beat was adjusted as quickly as possible to 60 cycles, as indicated by a circle on the scope. From here one checks the times at which the 120-, 180-, 240-cycle, etc., patterns occur on the scope. It is relatively easy to identify these harmonic patterns as, momentarily, the rows of loops become stationary. It is possible to check up to the 15th harmonic or 900 cycles, even though one cannot count the actual number of loops after there are more than a half dozen visible.

The scheme worked beautifully, and deflated my opinion of the v.f.o. which I have been using. — *E. E. Pearson, W3QY*

(Receivers with 3.2-ohm output may not have enough voltage from the receiver for direct connection to the vertical plates of the oscilloscope. The scope's vertical amplifier, or an audio output transformer with its high-impedance side connected directly to the vertical plates, may be used. — *Editor.*)

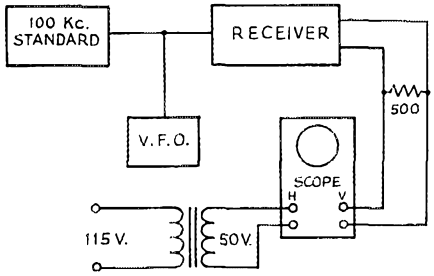


Fig. 3—Test setup for v.f.o. drift measurement by comparison with 60-cycle power line.

Its Characteristics and Applications

BY JAMES J. CRAVEN, JR.,* W1NBQ

THE advancements in nickel-cadmium cells and banks of cells make their use desirable for general purposes, including operation of communication equipment, small machine tools such as drills, and many other equipments. With proper design, solid-state devices such as receivers and low-power transmitters may be operated as either a.c.- or battery-powered equipment; simply disconnecting the power cord converts the unit to self-contained battery operation. A circuit is easily designed for charging from a 12-volt vehicle circuit, allowing removal of the equipment for hand-held operation.

This article is presented for general information, and the price of the cells should be determined before attempting extensive redesign of equipment. Presently, the nickel-cadmium cells show superiority over lead-acid cells. Silver-cadmium and silver-zinc cells have similarities to nickel-cadmium, but of the three alkaline types the nickel-cadmium is more advanced in design and is available at the least cost. For these reasons, only the nickel-cadmium cells will be discussed.

General

The first experiments with the nickel-cadmium cells were conducted in the early 1900 period, at about the same time that the nickel-iron or Edison cell was developed. Although the nickel-cadmium cell had some advantages over the Edison cell it was not until recent years, when a method of hermetically sealing the cells became practical, that banks of these cells became of exceptionally practical value for general use. However, many industrial installations of the open-type nickel-cadmium units have been successful, because alkaline types have the ability to withstand both electrical and mechanical abuse. The lead-acid cell will not equal the recharge ability of nickel-cadmium after deep discharge, although the performance at low temperatures is slightly better.

The sal-ammoniac cell (flashlight cell) is a primary cell and is not intended to be recharged. In comparison, the nickel-cadmium cell is capable of hundreds or even thousands of recharge cycles. Weight per watthour of the nickel-cadmium units is slightly greater.

Banks of nickel cadmium cells have given good performance in satellites such as Explorers XII, XIV and XV. Most all other satellites have used banks of these cells successfully.

Construction

The nickel-cadmium cell is made up of a nickel cathode [1] (positive) and a cadmium anode

[1] The electrode from which the electrons leave, inside the cell, is considered the cathode. The electrons move internally from the positive electrode to the negative electrode in normal use.

The nickel-cadmium cell is a true storage cell, capable of being recharged to normal capacity after complete discharge. Its unique characteristics make it worth considering for battery-operated equipment using semiconductors. As it is not too well known in amateur circles, the background information offered in this article is timely.

* P. O. Box 73, Gardner, Mass. 01441

(negative) immersed in an alkaline solution of potassium hydroxide (KOH) at a specific gravity of 1200 to 1400 (usually 1300). A separator is used to hold the electrolyte and prevent the movement of the basic electrode material.

When the conventional open-type nickel-cadmium cell comes to full charge the positive electrode generates oxygen and the negative electrode generates hydrogen. If a cell is to be sealed this situation must be overcome. This is accomplished in manufacture by preparing the positive electrode in such a manner that it becomes charged first. The negative electrode, then, never quite reaches full charge, thereby preventing the generation of hydrogen. The cell may be hermetically sealed, leaving a small space to allow for expansion. When the cell is exposed to excessive overcharge, a slight internal pressure can result from the generation of oxygen. Under normal overcharge the oxygen is offset by absorption at the negative electrode. The cells must be sealed against gas leakage to maintain overcharge tolerances. Sometimes encapsulation or potting methods are used.

Various methods are used for sealing the cell. A consideration in manufacture is that there must be some balance between the amount of

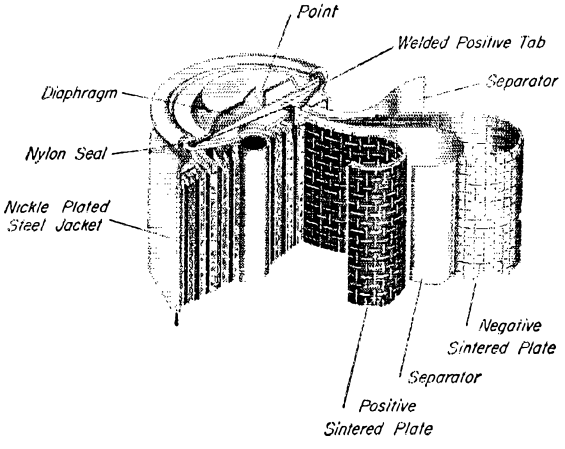


Fig. 1—Construction of a sealed cell (Sonotone). The plates are sintered nickel powder in a fine-mesh nickel screen, forming a porous structure which is processed to make the positive and negative electrodes. If the internal pressure rises for reasons discussed in the text, the diaphragm is forced against the point and punctured sufficiently to relieve pressure. The cell will continue to function when this happens, but is no longer sealed.

pressure the cell will withstand, as a result of the amount of space allowed, and the size of the cell. If the recommended charge rate is not exceeded and the temperature is maintained within reasonable limits, the problem becomes small. The occasional situation, where "runaway" conditions occur because of very high temperatures, or where human error might allow excessive charging rate, requires methods to prevent cell rupture. One manufacturer places a puncture element against a dome section. This causes a puncture large enough to relieve the pressure if it becomes too great, but not so large as to allow electrolyte leakage. If a cell becomes punctured and the cause is removed the cell is not considered to have failed, since it will continue to operate the same as an open-type cell but with the advantage of a non-gassing negative electrode. Some manufacturers allow the cells to breathe but they will not leak. The term "sealed" does not necessarily mean hermetically sealed.

When banks of cells are used to obtain higher voltages or current ratings, cell uniformity becomes an important factor. It is recommended that cells used to form a battery be of exactly the same age and preferably from the same manufacturer's lot. One of the advantages of the nickel-cadmium cell is its capability of deep discharge, to a point where little or no current may be drawn, and the return to normal when properly recharged. However, if this condition is allowed to occur, a weaker cell in the bank can reverse polarity and not return upon recharge. The cell concerned may have been defective in manufacture or may have lost uniformity because of variations in aging. Under these conditions a cell must be considered to have failed and the entire bank replaced; because of the very sharp drop in voltage at the end of the discharge cycle it is extremely difficult to replace a cell and match the age characteristics with any success, and a new cell added to the bank would not fulfill the requirement of cell uniformity. A voltage check of a charged bank of cells will not reveal this trouble, in most cases, since the difference between full-charge voltage and rated voltage is wide. If a discharge level of 50 percent of capacity or less is not exceeded, cell reversal usually will not occur.

When a bank of cells is used consistently to a specific discharge depth (such as 20 per cent discharge) and then brought to full charge, over a long period of time there is a tendency for the cells to show reduced current delivery below the 20-percent discharge level. If the bank is occasionally discharged to 50 or 75 percent of the rating this condition will not occur.

The shelf life of nickel-cadmium cells when fully charged is extremely outstanding. When stored at 34 degrees F. the loss in rated capacity in one year is so slight it need not be considered. If stored at room temperature the cell will lose an average of 3 percent per month for long periods although the loss during the first month will be far greater than ensuing months. However, at higher temperatures the loss rapidly increases to about 50 percent in two weeks at 140 degrees F.

Use and Care

The rated voltage of the nickel-cadmium cell is considered to be 1.25 volts under normal load for the particular cell concerned. When placed in use at 1½ times the rated current capability,

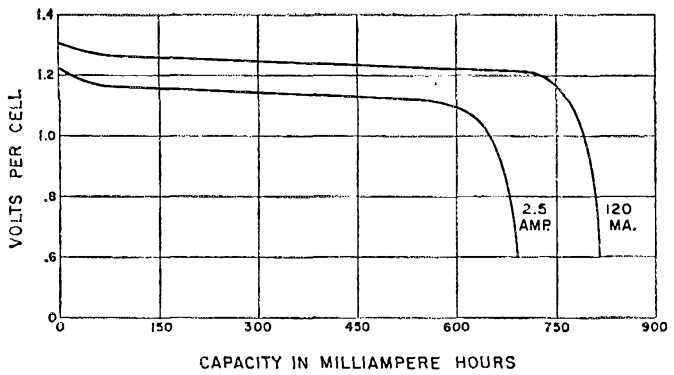


Fig. 2—Voltage *vs.* milliampere-hour capacity at two discharge rates, 2.5 amp. and 120 ma., for a cell rated at 810 milliampere-hours (Sonotone S-102).

it will deliver almost the full milliampere-hour rating at voltages between 1.37 volts and 1.1 volts, after which the voltage drops sharply. A sealed cell in good condition can be recharged on the basis of a ten-hour rate to the full capacity at 1.37 volts. When removed from the charging circuit there is a tendency for the voltage to increase, in a cell in good condition, to 1.4 volts (open circuit voltage). When again placed in service the voltage, of course, will drop slightly in accordance with the load or as explained above. Charging time of fourteen to sixteen hours at a slightly higher voltage (1.45 volts) is recommended by most manufacturers to assure satisfactory service. It is always necessary to replace a little more energy than is used. On the basis of a ten-hour rate or less, the cells may be left on charge for long periods of time without damage and will be ready for use even after months of uninterrupted charging. Similarly they may be left without recharging for long periods if they are not in use. When recharged they will perform as well as ever. As can be seen, the overcharge tolerance is outstanding. Also, it shows some improvement at lower temperatures.

For many purposes a bank of cells is used, consisting of two or more individual cells of a type determined by load requirements. These are connected in series or series-parallel. Voltages may be derived by multiplication of the above data in accordance with the usual methods. Current capabilities must be established from the cell data and the number of parallel circuits.

A simple charger unit may be constructed using a transformer with a secondary voltage of the proper value with a diode of sufficient current rating in series with one of the leads. A variable resistor may be used for adjustment, if the charger is required to take care of several combinations of cell banks. Always connect the positive lead of the charger to the positive contact of the cell bank.

An a.c. power supply can be designed to operate a device, with a cell bank connected in the circuit to assure fail-safe operation in case of power failure. The power supply should be capable of delivering a constant charge of 20 to 25 percent of the cell-bank charge rate. If the voltage of the device is critical it should not be operated without the cell bank, since voltages will rise without the cell-bank load. This is especially true where solid-state devices, such as transistors, are concerned.

A specific example is the case where ten cells, size D, are connected in series to operate a transistorized time standard. The manufacturer's ratings for the cell bank are 12.5 volts, 4000-milliampere-hour capacity and 400-milliampere charge rate. A power supply delivers 150 milliamperes to the load and a constant charge of 100 milliamperes to the cell bank. In case of power failure the bridge rectifier in the power supply prevents discharge through the power supply, and the cell bank operates the equipment without loss of time. When the power is returned the cell bank is recharged.

Care of Open Type Cells

Although the information presented has been directed toward hermetically-sealed cells it will apply to open-type cells as well. In addition, the open type must be kept dry and free of water from condensation or other sources. Trays or racks, when used, must be clean and dry. A 3-percent solution of boric acid on a rag or cotton waste may be used for cleaning or to neutralize spilled electrolyte. If cells are on intermittent use they should be recharged if the open-circuit voltage is below 1.3 volts. Specific-gravity readings are not entirely dependable because of hydration.

CAUTION

Gas generated during charge or discharge is explosive. Ventilate the area where open-type cells are used. QST

Electrical Characteristics of Nickel-Cadmium Sealed Cells *

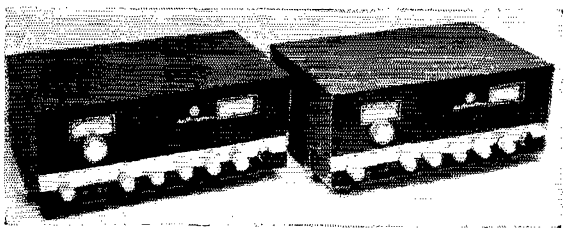
Nominal oper-circuit potential, volts	1.33
End-of-charge potential, volts	1.60 at 30°F. 1.50 at 80°F. 1.45 at 110°F.
End-of-discharge potential, volts	1.0
Allowable continuous overcharge rate.[1]	0.1*C*

*From "Gulton Hermetically Sealed Nickel-Cadmium Cells."

[1] *C* is capacity of cell in ampere-hours.

• Recent Equipment —

The Hallicrafters SR-42 and SR-46 V.h.f. Transceivers

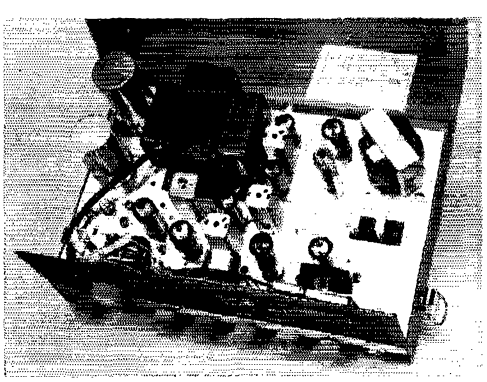


THOUGH s.s.b. is becoming more widely used in v.h.f. communication all the time, there is still plenty of interest in a.m. rigs, particularly the compact variety usable for either home-station or mobile work. The Hallicrafters SR-42 and SR-46 are moderately-priced a.m. transceivers for 144 and 50 Mc., aimed at this considerable market. They are almost identical units of a size and shape that is convenient for car use, equipped with power supplies that can work from either 115 volts a.c. or 12 volts d.c.

The only difference between the SR-42 and 46 that can be seen from the outside is the lettering on the panels, and it takes a fairly careful inspection of the interior to tell which unit you have before you. In performance and operation they are very much alike, as well, but a close look at the block diagrams in Fig. 1 will disclose differences as well as similarities.

Circuitry

First let's take similarities. They're both a.m. transceivers, with double-conversion receivers and crystal-controlled transmitters of about 5 watts output. The basic circuits are similar, except that the SR-42 has one more tube in the transmitter portion, to get to the higher frequency. The receiving lineups are almost identical, from the output of the first mixer on. Both convert the signal to 20.15 Mc. therein, and follow with a crystal-controlled oscillator-mixer converting again to 1650 kc. Next are two i.f. amplifier stages, using 12BA6s, followed by a 12AL5 diode detector and automatic noise limiter, and two audio stages. The first audio amplifier is one half of a 12AT7, the other half of which serves as a microphone amplifier in transmitting. A 12AQ5 is a common second audio amplifier and modulator.



Interior of the SR-46 Transceiver. Appearance of the SR-42 is identical, except for one more tube in the right front portion of the chassis. Tuning is by means of a rim-drive vernier dial, left.

In both receivers the tuning range is broken up into two 2-megacycle segments, a step that will appeal to anyone who has tried to tune a 4-megacycle band with appreciable receiver selectivity. It just can't be done with any ordinary tuning mechanism, and the tuning device in these transceivers is about as "ordinary" as they come. It is a friction-drive dial of just about the ultimate simplicity, but it does the job smoothly and without noticeable backlash. The tunable oscillator range can be shifted two megacycles higher in frequency by a front-panel control that puts another coil across the oscillator tuned circuit.

The r.f. amplifier stage is a 13CW4 Nuvistor in both units. A double-tuned coupling circuit between this single stage and the mixer provides a certain amount of band-pass effect, and helps to improve the rejection of out-of-band signals. It should be of interest to the many v.h.f. men who have fiddled with inductive neutralizing circuits to note that a version of the capacitive-bridge system commonly used in transmitters is employed in these front ends. A 22-pf. bypass is used at the low end of the grid coil, and the neutralizing capacitor is 3.9 pf., connected from plate to the top side of the grid-coil bypass. A.v.c. is applied to the r.f. stage, and to the 12BA6 1650-kc. i.f. stages.

The crystal oscillator in the transmitters is the triode portion of a 7059, in an overtone circuit in which the low side of the crystal is returned to a capacitive feedback network in the plate circuit. Crystals between 24.0 and 24.666 Mc. are used in the SR-42 and 25 to 27 Mc. in the SR-46. The manufacturer doesn't mention it in the instruction books, but this circuit allows overtone operation with active 8-Mc. crystals. Not all surplus crystals will "take off" with the feedback provided, but most of the considerable batch we tried did. Where they do oscillate, they provide the same output and at least as good stability as the 24 to 27-Mc. overtone crystals specified. Watch out for any that are near band edges, however. The frequency may not work

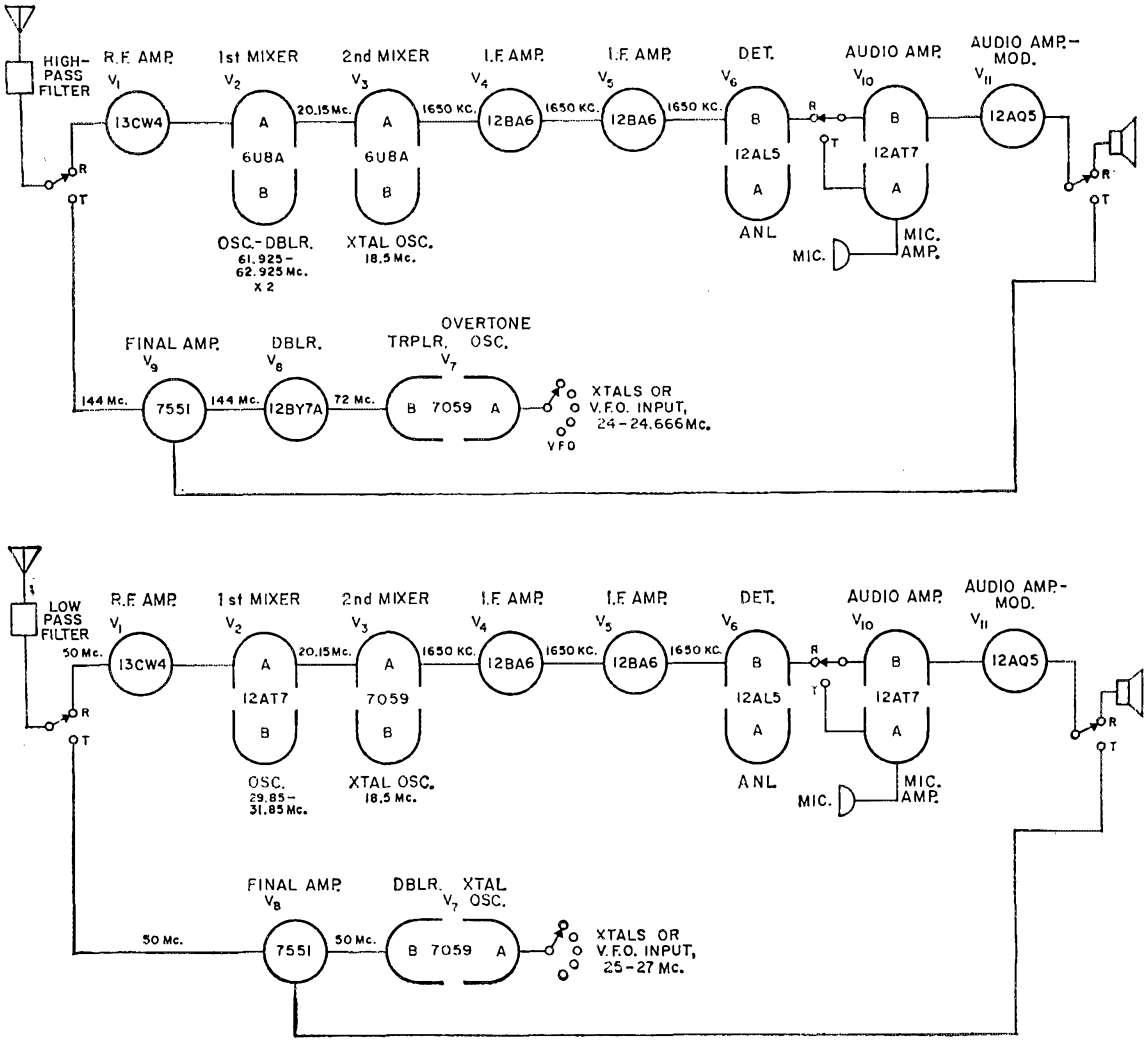


Fig. 1—Though the photographs make the SR-42 and SR-46 appear practically identical, block diagrams of the two units show that there are quite a few differences.

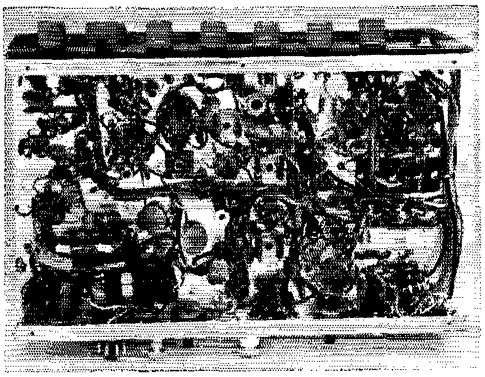
out to exactly three times that marked on the crystal holder.

The output amplifier in the transmitter is a 7551, running straight through, driven from the pentode portion of the 7059 in the 50-Mc. rig, and a 12BY7A doubler in the 144-Mc. one. Provision is made for external v.f.o. in both transmitters. The output of the v.f.o. should be in the 24 to 27-Mc. range.

Now we can get to the differences, of which there are more than meet the eye of the casual viewer of the two transceivers. As already mentioned, the SR-42 has a 12BY7A doubler stage following the oscillator in the transmitter. In the receivers the tunable oscillator in the SR-46 is one half of a dual triode. It tunes 29.85 to 31.85 Mc. for the lower half of the 50-Mc. band, or 2 Mc. higher for the upper half. In the SR-42 an oscillator-doubler is used for injection. The pentode portion of a 6U8A tunes 61.925 to 62.925 Mc. (or 62.925 to 63.925 Mc.) with its plate circuit doubling to furnish injection to the triode of the 6U8A, which is the first mixer. This oscillator-doubler helps to give the SR-42 its quite good stability.

The crystal-controlled second mixer-oscillator is a 6U8A in the SR-42 and a 7059 in the SR-46. Both are triode-pentodes.

It will be seen from the foregoing description, and from the block diagrams, that the front-end circuitry of the receivers is quite simple. This would leave them open to considerable spurious-signal trouble, but for the inclusion of a high-pass filter in the antenna circuit of the SR-42, and a low-pass filter similarly in the SR-46. Neither unit is completely devoid of interference from f.m. and TV stations in locations close by such installations, but they do pretty well, on the



Bottom view of the SR-42 transceiver.

whole. Should there be any problem in this respect it could very likely be taken care of by insertion of a coaxial or strip-line filter in the antenna lead to the unit. Such filters are easy to make, and some are now becoming available commercially.

Operation

Send-receive control is entirely by means of the push-to-talk button on the microphone. There is no provision for direct switching otherwise. The automatic noise limiter is just that — it's in there all the time. Reflecting on long experience with such rigs this latter point seems to be no handicap. How often is the noise limiter ever turned off on a v.h.f. receiver, when there is provision for doing so?

The transceivers come through equipped for a.c. operation only. A "mobile kit" including the vibrator, a fused battery cable, and a carrying-mounting handle is an extra-cost option. In the units tried we encountered quite a bit of vibrator hash, using the same vibrator unit in both rigs. Replacing the vibrator made things considerably better, and an inexpensive transistorized vibrator substitute cleaned up this trouble completely.

The selectivity of the double-conversion receivers is considerably better than that of early transceivers made for the v.h.f. market. We wondered if this would not show up some drift or other oscillator-instability problems, particularly in mobile work, but such has not been the case. The voltage on the receiver tunable oscillators is zener-regulated, and this seems to take care of the fluctuations that occur in mobile work between engine-running and engine-off conditions very nicely.

Performance of the receivers is more than adequate for matching the effective range of the low-powered transmitters, the Nuvistor front ends providing noise figures more than good enough. The transmitters operate well, on the whole, though both are incapable of 100 percent modulation, especially on the negative peaks. This is a common failing in v.h.f. amplifiers, and the SR-42 and 46 are neither better nor worse than most in this respect. We did note a tendency to self-oscillation with a crystal that is sufficiently inactive to operate properly. The transmitter appears to tune up normally under these circumstances, and unless you check the output frequency carefully, or monitor the signal quality with a selective receiver, you might not be aware of this lack of crystal control. There is no problem with a good crystal in place, however.

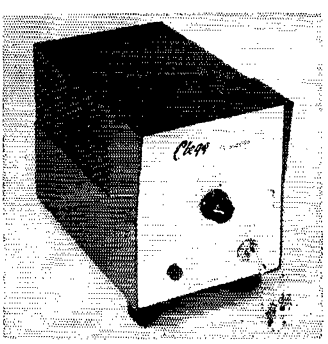
Your reviewer found only one thing lacking: provision for transmission and reception of c.w. Usually we are told that this is omitted because the stability is not good enough for satisfactory c.w. work. This does not hold for the SR-46, at least. We took the liberty of breaking the cathode return in the transmitter of the 50-Mc. unit, and we tried running in a 1650-kc. signal for a beat oscillator. The result was not the best c.w. in the world, but it wasn't the worst, either. We'd make the keying modification, and find room somewhere for a transistor b.f.o., if we were going to be using the equipment for long.

— *W1HDQ*

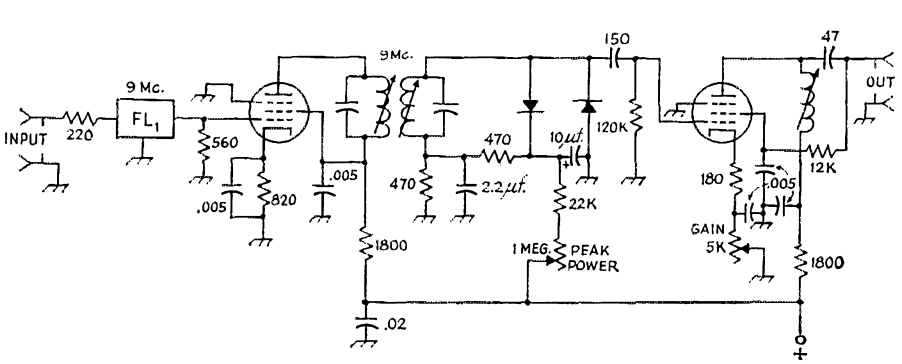
Hallicrafters SR-42 and SR-46 Transceivers

Height: 5½ inches.
Width: 12⅛ inches.
Depth: 8¼ inches.
Weight: 17 pounds.
Power requirements: 115 volts a.c., 65 watts, or 11 to 16 volts d.c., 5 amperes.
Price Class: $189, less mobile kit.

Clegg SS Booster



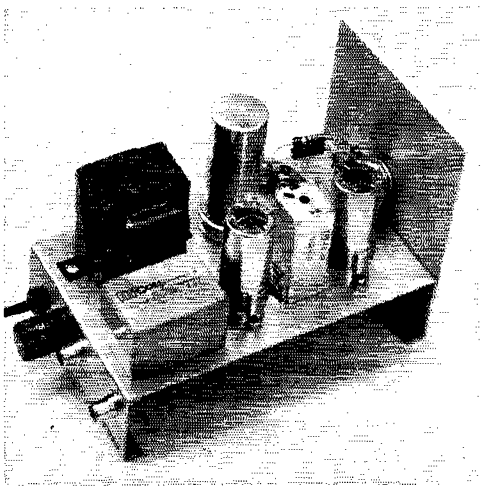
On a.m., speech clipping without increasing the bandwidth is a relatively simple way to improve the signal's effectiveness, because it can be done at audio frequencies. On single sideband speech clipping without increasing the bandwidth becomes a little more complicated, because it must be done at radio frequencies. The increase in average power output is quite striking, however, and is obvious to anyone who can read a 'scope or a meter.



Circuit diagram of SS Booster, with power supply omitted. Note that the screen voltage for the output tube is obtained from the transceiver; this allows the Booster to be turned on or off from the Venus.

The Clegg SS Booster is a small auxiliary unit designed to go with the Clegg Venus 6-meter transceiver. The 9-Mc. double-sideband balanced-modulator output of the Venus is piped to a 9-Mc. sideband filter in the Booster. The resulting normal single-sideband signal is amplified by a 6BA6 stage and then clipped by a double-diode full-wave clipper. An adjustable bias control for the diodes is used to set the level at which clipping starts. The clipped signal is then amplified by another 6BA6 and piped back to the Venus, where the normal sideband filter restricts the bandwidth of the clipped signal.

To demonstrate the effectiveness of the Booster, the output of the Venus should be fed to a dummy load via an r.f. wattmeter, and the output should be monitored simultaneously on a 'scope. With the bias in the booster set high enough to avoid any clipping, the usual sideband signal can be observed on the 'scope, and the wattmeter indicator will kick up in the usual half-hearted fashion. Louder talking into the mike results in obvious "flat-topping" of the 'scope pattern, with its consequent splatter. With the Booster cut in and properly adjusted, it becomes impossible to flat-top, but two obvious differences can be observed. The wattmeter indicator now hangs up near a higher value than it ever did before, and the 'scope picture is much "fuller." Both the wattmeter hang and the 'scope picture indicate the same thing — higher average power — but the wattmeter reading is more dramatic, unless you are in the habit of thinking of power in terms of oscilloscope-pattern areas.



The SS Booster is a deceptively simple-looking device for what it does. It consists of two tubes, a single-sideband filter, a small power supply, a "peak power" panel control (sets bias on full-wave clipper), and a gain control (screwdriver control, hidden by i.f. transformer).

Clegg SS Booster

Height: 5⅜ inches
Width: 4 inches
Depth: 7 inches
Weight: 4 pounds
Power Requirements: 117 volts, 60 cycles, under 10 watts
Price Class: $100
Manufacturer: Squires-Sanders, Inc., Martinsville Road/Liberty Corner, Millington, N. J. 07946

One has to be a little careful about external noise when using a Booster. Because the gain is raised by the amount of boost, local noises that were no problem with no boost can be received loud and clear when the boost is in. And one can't use a Booster with just any old linear amplifier following the Venus. The amplifier has to furnish the additional power, and if the linear was marginal with no Booster, it will never make it when further power demands are made. But given amplifiers (and power supplies) that will furnish the extra power, increases of 10 db. in average power with little loss in intelligibility are readily obtained. Up to 20 db. has been observed.[1] — *W1DX*

[1] Squires and Clegg, "Speech Clipping for Single Sideband," *QST*, July, 1964.

• 1965 Novice Roundup Results •

February 6–21 activity brings reports from 371

THE best way to realize just how far the Novice Roundup has progressed since the report of the first NR in a 1952 *QST*, is to compare reports. The first test had 92 Novices report, the 1965 affair has 272. The first one had 15 non-Novices report their efforts, while this report contains reports of 99. Novice and non-Novice participation has come a long way and as you might expect, scores have increased correspondingly. The top score over-all reported in 1952 was 6392 points. Fifty-five Novice entrants topped this mark in 1965 with the highest score by a Novice that of WNØKHD of Minnesota, just topping 20-K. All 52 section leaders will receive handsome certificate awards, scheduled for mid-July mailing.

NOVICE DIVISION LEADERS

Atlantic	WN3BLE	New England	WN1CQF
Central	WN9LDK	Northwestern	WN7CAQ
Dakota	WNØKHD	Pacific	WN6LVT
Delta	WN5KAJ	Roanoke	WN4UXU
Gr. Lakes	WN1CLZ/4	Rocky Mt.	WNØKBT
Hudson	WN2MYY	Southeastern	WP4CLB
Midwest	WNØJZY	Southwestern	WN7BOB
		West Gulf	WN5JMY

SOAPBOX

"Hiked my WAS from 23 to 44." — *WN3AUM/3*. . . . "Many of the gang missed new and rare sections by not listening enough and constantly calling CQ." — *WN3BGN*. . . . "These one minute QSOs are fun!" — *WN3BSV*. . . . "I worked *sixteen* new states." — *WN3CMH*. . . . "I was quite surprised at the numbers of hams who answered a CQ NR and then didn't know what the NR was." — *WN2NFS*. . . . "Great contest, upped my WAS from 21 to 32." — *WN3BGE*. . . . "A great big thank you to those I worked and to ARRL for sponsoring this f.b. introductory experience in contest operating." — *WN3AOH*. . . . "Ah, peace and quiet at last." — *WN9CVJ*. . . . "Didn't gain much (!) from this NR, *except* a c.p. credit for 35 w.p.m." — *WN9LNS*. . . . "Maybe that code practice helped. The 2nd day before the end of the Roundup I took and passed *my* General." — *WN9MWA*. . . . "Didn't anyone from Vermont enter?" — *WN9LDK*. . . . "That was a lot of fun." — *WN9NPC*. . . . "So busy sending out cards I almost forgot to send in my NR log!" — *WNØJCT* "My first QSO in my first contest was with my first Canadian." — *WN4UOX*. . . . "If only I didn't have to do homework." — *WN2MYK*. . . . "After six months on the air I worked my first W7, W7AYY in Arizona." — *WN2ORH*. . . . "Between my two boys and the QRM, what a mess!" — *WN2PFD*. . . . "Wow, it cost me almost $6.00 to QSL 100%!" — *WN2QYO*. . . . "Where were the south and west?" — *WNØIJP*. . . . "Maybe I'm the highest YL score in Connecticut!" — *WN1CWQ*. . . . "If I win for Eastern Massachusetts it will be the 2nd time in a row that any operator from the small town of Norfolk took it (population under 2000). KN1ETP won last year." — *WN1CCZ*. . . . "This was *enjoyable* work and quite an experience to go through." — *WN1CBP*. . . . "WN1CSW is my brother and I had no chance to operate. (Must be his big brother, ed.)" — *WN1CSZ*. . . . "Reception was pretty poor at times." — *WL7FEF*. . . . "Three cheers for the Roundup, my biggest thrill since my first QSO." — *WN7AUS*. . . . "Enjoyed the contest greatly, teaches correct operating procedures." — *WN6KPL*. . . . "Looking forward to giving Novices the same thrill next year that the Generals gave me this year." — *WN4UMX*. . . . "Worked six new states bringing my total to 38." — *WN4WAG*. . . . "Besides work and school and track practice I feel my 2883 points was fair. I used an all homebrew station running a massive 52 watts!" — *WN4UMJ*. . . . "Many 'first NH' reports received." — *W1DYE*. . . . "I was glad to hear many K7s in there on 40 and even a lonely KL7 punching out many an unanswered CQ." — WB2KXG, opr. *W2GSA/2*. . . . "A tip for the next crop, don't neglect 21 Mc." — *W2MUM*. . . . "Novices are just too darned long-winded." — *WB2JQS*. . . . "Excessively long calls and superfluous comments, while not entirely missing, were rare. The signals and keying heard were generally excellent." — *K3HNP*. . . . "Always enjoy meeting the newcomers and upcoming contest enthusiasts." — *W4KFC*. . . . "I would like to point out the excellent operating of WP4CBL and WN6NBV." — *WB6IEX*. . . . "Always a pleasure to work so many fine new operators in the Novice Roundup." — *WA6VTL*. . . . "Surprised that so many needed an Idaho QSL." — *W7IUO/7*. . . . "I got a kick out of working WN7 BOA BOB BOC." — *K8SWW*.

Hudson Division and Eastern New York leader WN2MYY worked 3 bands for 13,365 points. Charles said he spent an hour looking through back *QST*s trying to think of a good comment for the "Soapbox." He concludes he had better take a course in creative writing.

SCORES

Scores are grouped by ARRL Divisions and Sections. The operator of the station listed first in each section is award winner for that section. *Example of listings*: WN3AUM/3 14,112-268-49-32, or final score 14,112, number of stations 268, number of sections 49, total operating time 32 hours.

ATLANTIC DIVISION

Eastern Pennsylvania

WN3AUM/3	14,112	268-49-32
WN3BGN	10,848	216-48-34
WN3CBN	10,534	229-46-40
WN2MZJ/3	10,150	203-50-38
WN3BEX	8184	171-44-16
WN3BSU	6528	204-32-32
WN3BQJ	4500	125-36-25
WN3BRI	4284	111-34-26
WN3BHM	2291	79-29-28
WN3BHT	2233	77-29-18
WN3BZT	2088	87-24- 7
WN3BSV	2002	77-26-13
WN3CCS	1917	71-27-21
WN3CEJ	1320	55-24-14
WN3AHY	1078	49-22-12
WN3AQY	552	26-12- 6
WN3BOW	242	22-11-12
WN3CRM	100	10- 5- 2

Maryland-District of Columbia

WN3BNT	13,200	205-60-40
WN3AUC	11,970	190-66-32
WN3BEH	10,149	189-51-26
WN3BGC	6235	130-43-40
WN3AMO	4900	140-35-24
WN3ARD	2511	93-27-25
WN3CMH	2490	83-30-40
WN3BPC	1562	61-22-13
WN3CEC	320	20-16- 8
WNCBTA	252	21-12-30
WN3BKX	80	10- 8- 5

Southern New Jersey

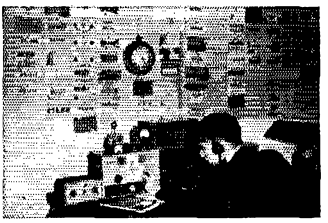
WN2RFP	133	9- 7- 8

Western New York

WN2PAH	16,380	315-52-37
WN2RBT	4095	107-35-21
WN2NFS	2352	84-28-33
WN2NNJ	1850	74-25- -
WN2NJN	1278	71-18- -
WN2NWV	950	50-19- 9
WN2OTQ	777	37-21- 9
WN2QZX	672	42-16-16

Western Pennsylvania

WN3BLE	18,012	306-57- -
WN3CCF	12,032	236-47-39
WN3BMV	8320	193-40-40
WN3BGE	7175	190-35-32
WN3BZR	3658	118-31-38
WN3AWH	1674	62-27-15
WN3CDL	700	30-14- 8
WN3BTB	493	29-17-12
WN3AOH	444	22-12-16



Active participants in the Roundup were (left to right) WN4TPB with 10-K from Kentucky with an f. b. showing all on 40 meters; WN3BGN working 40 and 15 from Eastern Pennsylvania; WN4VMI and his fine Kentucky shack.

CENTRAL DIVISION

Illinois

WN9NHQ	16,380-315-52-30
WN9MWC	11,232-196-52-31
WN9LVJ	7700-160-44-24
WN9LFU	6800-170-40-40
WN9LED	5994-152-37-28
WN9LNS	3978- 82-34- 3
WN9MWA	2800- 80-35-36
WN9LXQ	2772- 84-33- 7
WN9NYX	2204- 76-29-33
WN9NQW	2146- 74-29-10
WN9LMX	2046- 62-33-13
WN9LGA	1944- 81-24-17
WN9MKW	1824- 76-24-20
WN9NHF	1890- 70-27-12
WN9NKL	1400-100-14-16
WN9LLS	176- 16-11-10
WN9NFL	176- 12- 8-10

Indiana

WN9LDK	18,727-292-61-40
WN9LIP	11,350-227-50-40
WN9LKC	7568-161-43-39
WN9NHP	5822-142-41-28
WN9LLF	2790- 78-30-18
WN9NHX	627- 27-11-12

Wisconsin

WN9NBU	4830-115-42-31
WN9LKD	4255-115-37-22
WN9MIO	3450-100-30-12
WN9MSV	3038- 83-31-23
WN9NPC	2750- 95-25-19
WN9MRG	720- 35-16-10
WN9MCC	322- 23-14- 7

DAKOTA DIVISION

Minnesota

WNØKHD	20,008-328-61-40
WNØKDS	13,664-229-56-40
WNØJCT	3520- 88-40-33
WNØKQU	2929-101-29-11

DELTA DIVISION

Arkansas

WN5KAK	6030-134-45-24
WN5KUD	672- 33-14- 6

Louisiana

WN5KAJ	12,432-222-56-30
WN5KBZ	3034- 82-37-15
WN5KDQ	1708- 61-28-18
WN5JVL	660- 33-20- 5

Mississippi

WN5LKV	1632-102-16-26

Tennessee

WN4TFI	7560-158-45-40
WN4URA	920- 30-23-11

GREAT LAKES DIVISION

Kentucky

WN1CLZ/4	19,355-395-49-40
WN4TPB	10,320-240-43-24
WN4UOX	4582-158-29- -
WN4VMI	3774-102-37-23
WN4VLV	2816- 78-32-11
WN4VCN	2349- 81-29-14

Michigan

WN8NWT	12,336-247-48-35
WN8OFV	7436-143-52-28
WN8NIT	6156-162-38-21
WN8MVJ	1403- 61-23-12
WN8OFW	532- 28-19- 7
WN8OWF	522- 58- 9- 9
WN8OLN	20- 5- 4- 5
WN8MCQ	1- 1- 1- 2

Ohio

WN8NQC	12-880-260-46-30
WN8MCR	9000-185-45-36
WN8MQQ	8648-174-47-37
WN8LUZ	6270-165-38-26
WN8NAZ	6030-119-45-16
WN8NPN	4620-125-33-21
WN8NUL	3498- 91-33-17
WN8NTA	1950- 63-25-10
WN8MTS	1794- 69-26-11
WN8NRR	1605- 87-15-32
WN8ISE	1260- 43-20- 8
WN8OGI	1071- 51-21-20
WN8MGD	506- 31-11-11
WN8OSE	288- 26-11-24

HUDSON DIVISION

Eastern New York

WN2MYY	13,365-297-45-39
WN2MYK	5890-155-38-39
WN2NNG	2369-103-23-16
WN2OJJ	2028- 78-26-24
WN2MXF	1180- 53-20-26
WN2OLB	198- 18-11- 3

N. Y. C.-L. I.

WN2PWV	13,200-240-55-39
WN2PDO	6960-174-40-26
WN2NOU	4608-144-32-23
WN2OXD	4464-144-31-27
WN2PWU	2175- 75-29-20
WN2OAX	2002- 81-22-24
WN2ORH	1026- 54-19- 9
WN2PMP	992- 62-16-21
WN2PGH	836- 34-22-24
WN2QIL	705- 37-15-27
WN2PVY	351- 27-13-22
WN2OLD	310- 31-10- 5
WN2OYS	55- 11- 5- 4
WN2OOJ	2- 1- 1-

Northern New Jersey

WN2OTO	12,204-226-54-25
WN2PFD	10,388-212-49-40
WN2PBY	4725-135-35-23
WN2QYO	4408-152-29-40
WN2POG	1824- 76-24-16
WN2PNV	1113- 53-21-22
WN2PGJ	690- 46-15-21
WN2OXN	589- 31-19- 5
WN2QFK	480- 32-15-16
WN2PMK	286- 22-13- 8
WN2QGB	261- 19- 9- 3

MIDWEST DIVISION

Iowa

WNØJSD	3188-109-32-17
WNØKFU	2016- 69-24-24
WNØKFX	481- 37-13-13

Kansas

WNØJNZ	2072- 74-28-10
WNØJFC	1127- 39-23-13
WNØJVU	1044- 36-29-21
WNØIJP	171- 19- 9- 8

Missouri

WNØJNF	4830-115-42-34
WNØKMM	4788-111-38-36
WNØJVC	1675- 67-25-33
WNØKBZ	1050- 60-14- 4
WNØKXZ	1044- 58-18-18

Nebraska

WNØJZY	8415-172-45-30
WNØKIG	6513-152-39-30
WNØJES	2006- 59-34-14
WNØKAQ	984- 41-24-11
WNØJYM	380- 23-10- 8

NEW ENGLAND DIVISION

Connecticut

WN1CIY	8170-215-38-28
WN1CKI	7560-174-40-26
WN1CWQ	6000-150-40-40
WN1CLB	2976- 78-32-17
WN1CXN	1702- 74-23- 9
WN1BQL	1215- 71-15- 9
WN1BUP	688- 43-16-15
WN1DDG	348- 29-12- 7

Eastern Massachusetts

WN1CCZ	5247-159-33-40
WN1DCT	3875-125-31-29
WN1DAX	3472-114-28-26
WN1BZE	1664- 86-24-16
WN1BQC	1474- 57-22-16
WN1CTC	705- 47-15-10
WN1CFT	540- 26-15-19
WN1BZQ	216- 17- 8-15
WN1CFQ	16- 4- 4-1-

New Hampshire

WN1CBP	8977-191-47-37

Rhode Island

WN1BOP	2376- 88-27-40

Vermont

WN1DAN	1170- 55-18-39

Western Massachusetts

WN1CQF	10,850-217-50-33
WN1CSW	7955-167-43-23
WN1CTQ	3300-100-30-32
WN1CYG	2268- 84-27-38
WN1C8Z	1- 1- 1-1-

NORTHWESTERN DIVISION

Alaska

WL7FEF	470- 32-10-30

Idaho

WN7ADE	8100-165-45-40

Montana

WN7A8X	4446-102-38-38
WN7A8Y	2130- 56-30- -
WN7AQZ	646- 34-19-12

Oregon

WN7CAQ	11,136-222-48-37
WN7AQU	1188- 39-22-22
WN7AXK	495- 33-15-13
WN7BQU	24- 6- 4- 4

Washington

WN7BOC	5640-141-40-30
WN7AUS	1716- 65-26-12
WN7BDB	867- 36-17- 8
WN7BWG	168- 11- 8-10
WN7BTZ	15- 5- 3- 3

PACIFIC DIVISION

East Bay

WN6MBZ	456- 24-19-10
WN6NBV/6	192- 16-12- 6

Hawaii

WH6FON	1- 1- 1- 1

San Joaquin Valley

WN6MCA	1920- 64-30-27
WN6MGV	1722- 67-21- 7
WN6KPL	836- 38-22- 9

Santa Clara Valley

WN6LVT	6665-155-43-22
WN6JYN	5040-140-36- -
WN6LPZ	1984- 64-31- 5
WM6NXK	1020- 50-17-16

ROANOKE DIVISION

North Carolina

WN4UXU	10,761-211-51- -
WN4VVT	560- 46-10-16

Virginia

WN4UMX	8800-180-44-34
WN4UDI	2548- 76-28-24
WN4WJE	1810- 60-23-12
WN4WKX	722- 38-19-32
WN4VXR	88- 11- 8- 2

West Virginia

WN8NYT	3348- 88-31-15

ROCKY MOUNTAIN DIVISION

Colorado

WNØKBT	10,192-208-49-24
WNØKLF	513- 27-19-15
WNØKIU	350- 35-10-11

Utah

WN7BME	836- 38-22-20
WN7AUW	270- 17-10- 4
WN7BFW	187- 17-11-12
WN7CKB	48- 8- 6- 5

(*Continued on page 154*)

14-year-old Missouri winner WNØJNF led his section with 115 two-ways in 42 sections. The entire operation was on 40 meters.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

QSLing, so far as DX is concerned, can be much like the old army game. You rush, rush, rush — to stand in line.

Those lines are longer than ever these days but they're moving faster than ever. No more need a DX station shut down for weeks or months just to catch up on QSL debts. Some rare ones used to knock off permanently when the confirmation burden became too great. Others just quit answering W/Ks, source of most QSL pressure, and flitted about as unworkable phantoms or hid away on non-DX frequencies to avoid QSL difficulties.

The advent of the assisting QSL agent allows any DX station to QSO to his heart's content almost unmindful of the old pasteboard problem. Almost unmindful, but not quite. His QSL manager's neck is stuck 'way out. If the DX operator is lax in holding up his end of the agreement, merely seeing to it that his manager is thoroughly and punctually supplied with full QSO information, there's trouble. The QSL manager then has a tight grip on a very warm potato.

We've seen volunteer QSL aides, hard working and conscientious, completely frustrated and disillusioned by DX ops who rack up flocks of QSOs, then fail to provide their helpers with the necessary prompt log transcripts. No need to detail what happens; the innocent QSL agent is in the soup. Impatient and inconsiderate second, third, etc., requests pour in and, as K2UYG put it last month, "The whole experience becomes thoroughly unpleasant."

So here are pleas in behalf of QSL helpers everywhere. To DX stations: *Please* keep your QSL managers up to date with complete log information. To patronizing DXers: Take it easy on those QSL agents. They volunteered for a rather thankless task and, almost without exception, they're doing the very best they can.

What:

And don't forget those self-addressed stamped envelopes, or self-addressed envelopes with International Reply Coupons, when appropriate, gang. . . . Summer DX doldrums time now—or is it? Old 14 Mc. seems to be jumpin' with late spring fever. Let's take a look at a bit of the bag. An entry like "BY3NA (15) 12" means that BY3NA was observed active on 14,015 kc. at 1200 GMT. . . .

20 phone is the subject of mail from **Ws** 2SZ 3HNK 8YGR 8ZCQ, **Ks** 1QGC 2UYG 3SLP 3YZP 4MYO 6GSV, **WAs** 2KIZ 2WOR 2ZVJ 4PSA 4SRS 5HJK 5IPM 6TGH 9AQE, **WBs** 2LSV 6EFM 6FMJ 6ITM 6LCS, listeners W. Kilroy and L. Stewart concerning **BV1USA** (252) 3, **CE3s** PS* QB (330) 13, **CN8s** AW (130) 0, CR* (190) 22, **CO2KX***, **CPs** 1CY (120) 21, 8AB (240) 23-0, 5AD (150) 21, **CRs** 6GQ (130) 16, **7CI** 9AI (105) 15-16, 9AK, **CTs** 1EE* 1GE* 1JH* 21-22, 1PK 2AM (240) 22-23, **CX2CO**, **DUs** 1AA (110) 18, 1EH (258) 13, 1LM (110) 16, 1MR (243) 12, 9FB (115) 17, **EI4AK**, **ELs** 2AQ 6E (330) 17, 7B, **EP2s** AU (100) 12, AW RC (246) 15, RW, **ET3s** DR (135) 0, **USA** (110) 19, **F9s** RY/**FC*** YP/**FC** (251) 22, **FG7XL** (110) 19, **FH8CD** (280) 12-13, **FK8AU** (265) 5, **FO8BJ** 16, **FY7s** YF (115) 20, YL (290) 10, **GB2DX**, **GD3s** DPK 23, GMH, **HCs** 1FG 1WD (313) 15, 5NW (160) 21-22, 8FN (344) 17, **HH2CA**, **HIs** 4XAB* 4XEC* 8AMA 21, 8BRG, **HK0QA** (105) 19, **HL9s** KG (280) 10, TQ (244) 3, **US** (115) 14, **HM1s** AB (247) 2, AX, **HPs** 1JC (110) 23, 1PV (180) 23, **HRs** 1MD (330) 14, 1SO (105) 22, 2SC (310) 22, 3HH 23, **HSs** 1J (266) 14, 3RP 23, **HV1CN** (250) 15, **HZ1AT** (290) 20, **1S1s** BUA (345) 12, ZDT, **JA1BK**, **Ks** 6QYK/VO2 9MIJ/-**KV4**, **KAs** 2NY 5UC, **KB6EPN** (310) 8, **KC4s** USB USN (270) 6, **KGs** 1AX (222) 0, 1BO 4CI **6IG** (245) 11, **KH6-**EDY (253) 0, **KJ6DA** (335) 2-3, **KM6BI**, **KR6s** QW (260) 13, UL (241) 12, **KS6s** BH (286) 4, BK BO (280) 6, BQ (310) 9, **KW6s** CB (310) 6, EJ (300) 9, **KX6s** BU (320) 10, DB (270) 9, DQ (290) 10, DX (280) 10, **KZ5s** DR LP (300) 23, **LX1DE** (241) 20, **MP4s** BBW (103) 0, MAH (290) 7, TBM (125) 15-16, **OA4s** BP DQ (180) 23, EY* N, **OD5s** AI BV (130) 0, BZ (271) 19, LX 1, **OH0NI**, **OX3s** GZ KM (263) 11, LP MN, **PJs** 2AA (125) 21, 2MI (105) 12, 3CD, **PZ1BW**, **SV9s** WF (293) 20-21, WBB (271) 6, WGG (110) 19, WPP (120) 13-14, WR (120) 2, **TF3s** AG AP (130) 21, EA NA, **TG9s** EL EP (100) 12, RR (110) 23, **TI2s** HP IO RFT (120) 23, **TJ1AC** (261) 20, **TL8SW** (270) 19, **TU2AP*** (250) 19, **UAs** 1KED* (204) 15, 2AO 2KAK* 3FG/**UC2** 9DN (227) 14, 9KCE **0SK** (245) 13, **UB5WF** (325) 14, **UC2KMZ**, **UD6BR** (113) 3, **UG6AW** (240) 17, **UH8KAF** 22, **UI8s** AG (240) 2, KAE (240) 2, **UJ8KAA** (245) 12-13, **UL7s** FA (120) 2, JA (234) 1, KDT (242) 8, **UM8s** KAB (248) 2, FZ (122) 2, **UP2KBA***, **UR2s** AR 0, KAA (280) 23, **VEs** 7BFN/VE8 8AH 8MD 8NO, **VKs** 9CR (290) 5, 9JK (127) 13, 9NT (236) 13, 9TG (110) 14-15, 9XI (216) 14, **0GW** (252) 12, **VO1s** BX* 0, FB, **VPs** 1AB (120) 14-15, 1WH (330) 20, 2AT (282) 2, 2DL* 22, 2KD (130) 12, 2KL (135) 22, 2KM 2KR* 22, 2SM (340) 20, 3AA (275) 11, 3HAG (110) 22, 4VP (150) 22-23, 6KL (268) 10, 9FB* 18, 9FK (100) 23, **VQ9HB** (241) 20, **VR2s** EK (290) 8, ET (115) 8, **VSs** 6AJ 9MB (120, 310) 22, **VU2s** AX (190) 23, NR (118) 13 SX TX (120) 17, **Ws** 2ZIA/**ZK1** (280) 17, 7MINT/**KJ6**, (288) 4, 9FKL/**KJ6** (260) 8-9, **XE1s** KKV NE (150) 23, **XW8s** AL (107) 12, AM (109) 14, AX (225) 9, AZ (105) 15, **YAs** 3TNC (240) 17, 4A (239) 15, **YI2DSS**, **YK1AA**, **YNs** 1LB (135) 22, 3FP (140) 22, **YO8MN**, **YS1MFI** (115) 21, **ZB2AK** (255) 17, **ZDs** 5R (125) 17, 8BB (105) 21, 8HL (130) 18, 8JC (125) 22, 8TV (125) 17, **ZPs** 5CF 5KT 5OG* 7BJ (300) 21-22, **ZS3HX** (140) 20-21, **4U1s** ITU (272) 21, SU (110, 175) 13-15, **4W1Z** (300) 7-8, **4X4FQ**, **5As** 1TG (250) 7, 1TT (240) 23, 3TX **5H3s** JR JJ (280) 20, **5N2AAI** (235) 23, **5U7AC** (160) 17, **5X5IU** (280) 19, **5Z4s** DW (140) 18-19, GT (205) 17, **6O6BW**

*7862-B West Lawrence Ave., Chicago, Ill. 60656.

(130) 22, **6Y5AK***, **7Q7s** GN (130) 17, GS PBD (130) 17, FM (290) 19, **7X2s** AH MD (125) 7, **7Z3s** AA (241) 23, AB (110) 13, **9G1s** DY (109) 6, EY, **9H1s** AB (205) 19-20, W of Malta, **9J2AB** (250) 19, **9K2AM** (290) 20, **9L1s** JR (250) 19, SL (105) 17, **9Ms** 2BR (241) 15, 2EE (140) 17, 2GA (255) 14-15, 4LP (115) 15-16, 4MB (100) 13, 4MF (115) 14, 4US (245) 1, 6AC 23, 6BM (110) 16, 6LX (245) 3, 8EB (243) 14, 8KZ (110) 14-15, **9Q5s** DL* RW, **9U5s** BB and ID (125, 300) 18-21, the asterisks representing straight-a.m. signals.

SV1WW may be back on the air by now after a semester's schooling in France. Panayotis has a hard time finding parts for the maintenance of that venerable SX-28. Anyone got a spare oscillator bandswitch for same? (Photo via WB2FMK)

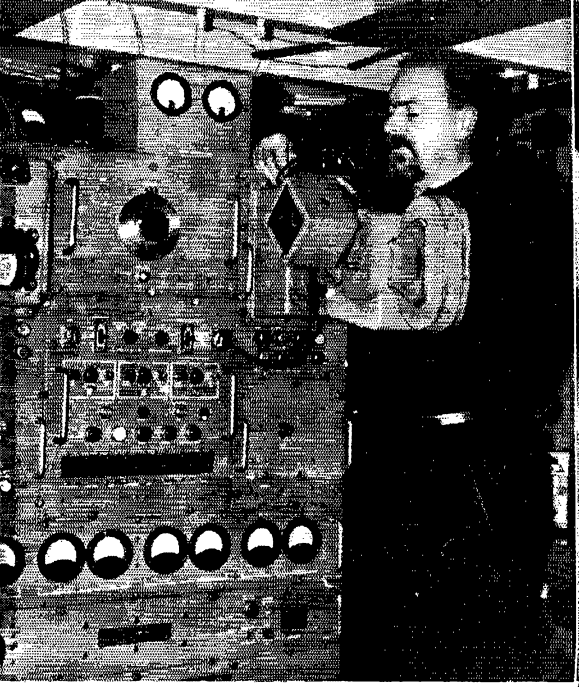
20 c.w. produces correspondence from **Ws** 1ECH 1RAN 1YYM 2ADP 2EAF 3HNK 5OBS 7DJU 7VRO 8YGR 8ZCQ, **Ks** 1QGC 2UYG 3Y7P 4MYO 5DZE 5MHG 6KA 6RXK 8YSO 0GSV 0JPL, **WAs** 2WIJ 2ZVJ 4HVC 4PSA 4SRS 5HJK 5IIS 5IPM 6TGH 6VAT 6WTD 8KEX 8MAT 9AQE 9GQT, **WBs** 2LSV 6CUU 6EFM 6FRP 6KPN 6MEQ, **DJ0PN** and KA7DR who discuss the merits of **APs** 2AR (23) 1-2, 5CP (65) 1, 5HQ (30) 16, **BV1US** (37) 23-0, **BYs** 3NA (15) 12, 9SX, **CMs** 1AR 2QN 6FA, **CN8MH**, **COs** 2AP 2JB 2KG 2SD 6AH 8HB, **CPs** 1EA 3CN 5EZ (4) 13, 5RA 8AM, **CRs** 4BB (19) 21, 4AE **6AI 6BX** (40) 17, **6DA** (85) 18, 6EI (66) 20, **7BN** (20) 23, **7IZ** (70) 0, 9AH (50) 0-1, **CT1s** GE TX, **CXs** 2CO 3AN 7AP 9PP, **DM2s** BTO CDL, **DUs** 1OR 1RBG 3DO 9AC (20) 20-21, **ELs** 2A 2AD 2AE 1-2, 2P 4AE, **EP2s** RC RW (5) 16, **ET3USA** (30) 0, **FB8s** WW (50) 13, YY (20) 7, **FG7s** XP (49) 17, XX (15) 2, **FK8s** AT (28) 2, BG (90) 5, EB (72) 8, **FL8s** AC (23) 3, RA (31) 23, **FO8AA**, **FR7ZI**, **FU8AG** (85) 10, **GC-2FMV**, **GD3s** FXN (10) 22, TNS (90) 14, **HAs** 1KSA (41) 19, 3GF (35) 23, 3MJ 5AT 9KOL (52) 12, 0LG (41) 12, **HH6D**, **HI8s** MMN RVD XAL, **HK0AI**, **HL9s** KA KB (22) 12, KW US 7, **HM3CG** (15) 15-16, **HPs** 1BR 1BT 1IE 4JQ, **HRs** 1GR 3JP (60) 23, 5NLC, **HS1GC**, **HZ3TYQ** (10) 21, **IS1FIC**, IT1AGA, JAs 1CIB 1CIO 1FDU 1IBX 1IFS 1KG 1MDH 2CNW 2SB 2XI 3ANC 3AOV 3CJU 3KM 4BJO 4BS 6PA 6PN 7AD 8BFI 8BMK 8GR, **JT1s** AA (41) 1, AD (60) 20, AG (41) 12, AJ (40) 2, KAA (30) 3, KAE (11) 1-2, Ks 3YMP/**KM6** 3, 9LMG/**VP4** (40) 2, **KAs** 2DF 2KS 2LD 5RC 7DR 8AB 9AS, **KGs** 4AM **6IG** (70) 12, **6IJ** 18, **KRs** 6BQ 6JZ (75) 18, 8AX, **KS6BN** (60) 12, **KV4s** AA CI (30) 7, **KW6s** EI (55) 1, EK, **KX6BQ**, **KZ5s** BC CH (10) 23, EH RD WE, **LAs** 2QP/p (18) 23, 4EJ/p (6) 23, 5AJ/p 3, 5QG/p 5ZP/p 8FI/p (70) 10, **LUs** 1ZA 2, 1ZC 3ZE, **LX1s** CF CO RA, **LZ1s** AG BC KAA KPZ WD, **MP4s** BFH (30) 22, MAH TBO 19, **OAs** 4KF (30) 22, 4PF 6W, **OD5s** AI (85) 22, LX (61) 22-23, **OYs** 1R 2H (25) 17, 2Z 7ML, **PI1LS**, **PJs** 2CN (20) 23, 2CZ 2ME 2MR 3CB, **PZ1AO**, **SV0s** WAA 1, WFF 1, **TAs** 1DB (45) 18, 2BB (17) 21, 4SO (44) 19, **TFs** 2WIW (50) 23, 2WJH 3, 3AB, **TI2s** PZ (10) 12, QKX (73) 23, **TL8SW** (1) 0, **TN8AF** 2, **TZ1A** (23) 17, **UAs** 1KED (38) 1, 2AC (70) 15, 2BZ 2KBD 2KJS 9HL 9HZ (65) 1, 9JH 9OH 9PS 9TK 9VB 9YW (40) 1, 0AG 0EI 0ER 0EW 0DX 0FC 0FF (13) 13, 0KAD 0KAE 0KCA 0KKB 0KKC 0KQB 0KSB 0KYA (37) 12, 0KYU 0KZB 3, 0KZW (5) 1, UB5s in quantity, **UC2s** AT KSA 0, KSB (10) 21-22, WP, **UD6A**Y, **UF6s** FE (58) 17, HG (50) 12, LA 4, **UG6s** AD 8, AV (70) 21, KAA, **UI8s** AI (65) 1, FB (34) 2, KBA, LC (45) 20-21, **UJ8s** AB (20) 2, AC (55) 3, KAA (62) 12, **UL7s** BG CG IP (76) 13, IR JE (25) 1, KBA KDT PJ (40) 1, RB (37) 2, RN RP, **UM8s** FM (60) 12-13, FZ (34) 2, **UN1BR**, **UO5s** KAA (50) 20, WN, **UP2s** BP BW (21) 12, DU KBC KCF NR, **UQ2s** GA GQ KCT KDD KHG, **UR2s** DZ FU IP (60) 19, KAC NN (75) 15, **UT5s** BP (82) 15-16, DG EH (75) 16, FI (75) 16, **UWs** 1OL 4, 3CX 4HW **9CC** 9CP 5, **9OP** 9OU (50) 4, **9PT** 0AF 0AP 0IF 0IK 0IP 0JG (25) 1, 0SC (30) 1, **VE8CO** (80) 1, **VKs** 4TE (42) 7, **9CJ** 9DR (22) 14-15, 9MJ 17, 9VM, **VO2s** AW NA, **VPs** 1HB 1WH 13, 2AM 2AV 2AX (10) 23, 4TR (10) 23, 4VU 5BR 5SG 6BP 6KL 6PJ 7NQ 7TA 8IJ (53) 0, 8IB 9BP 9CP 9EP 9EU (1) 22, 9FT (24) 22, 9FV (85) 20, VQs 8AI (45) 13, 9HB (18) 19, **VRs** 1B (28), 1S (15) 10, 2ER (10) 16, 4CR (86) 6, 4ED (10) 22, **VSs** 6FE 6FF (41) 15, 6FO (60) 13, 9AHE, **VU2s** AJ (60) 1, GW (65) 1, LE MR SU (41) 2, W5IUW/**VP9**, XEs a-plenty, **XW8s** AB (50) 21, AL AZ, YAs 1BW (40) 23, 3TNC (90) 22, 4A (10) 22, **YNs** 1AA 3KM, **YS1RFE**, **ZC4s** GB GY 5, **ZDs** 5M (60) 0, 7IP (20) 21, **ZEs** 1BI, 1DK (40) 12, 3JS 8JJ, **ZPs** 5EC 5LS 8OG, 3A2DA, **4S7s** EC NE (29) 2, RN WP, **4U1ITU** (41) 2, **4X4s** HK RX YL, **5A3TX** 0, **5H3JJ**, **5N2s** JAB 4, JWC, **5R8AN** (80) 18, **5W1AZ** (87) 8, **5Z4DW** (65) 19, **6Y5MJ**, **7Xs** 2AH 2ARA 2AP 3CT (12) 20, **7Z3s** AA (70) 22, AB (50) 19, **9G1s** EK (57) 6, EY 8, FK FQ TV, **9J2AB** (50) 20, **9K2AD** (75) 18, **9Ms** 2GA 4LP 4MT 4US (77) 1, 6AC 15-16, 6JW (52) 8, 6LX (15) 15, 8EB, **9Q5s** AL PA QR TJ and WR.

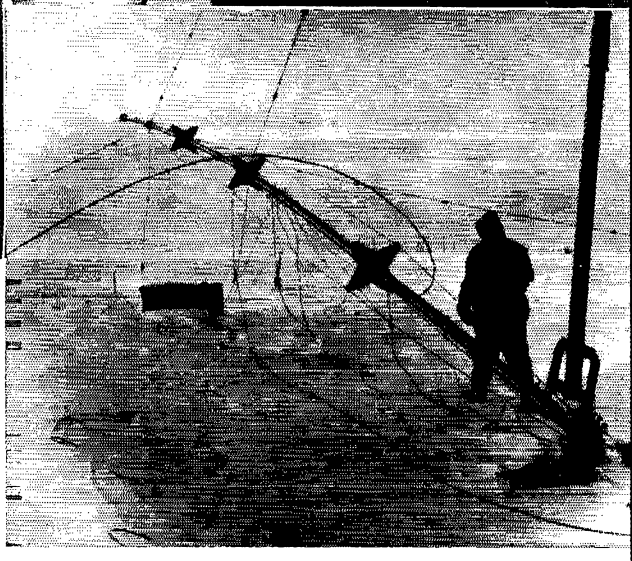
* * *

Next month we hope to crosscheck other DX ranges with the help of (15 c.w.) **Ws** 7DJU 8YGR 8ZCQ 9RCJ, **Ks** 1QGC 5MHG, **WAs** 2WIJ 2AZI 4HVC 4SQI 5IIS 6WTD, **WBs** 2JGI 2LSV 6KBN, **WNs** 1CGB 2PFD 7BOA 7BOB 0KDS; (15 phone) **W8s** YGR ZCQ, **Ks** 1QGC 6OVF, **WAs** 2WIJ 6WTD, **WBs** 2MJD 2NHX 6CGL 6LCS; (40 c.w.) **Ws** 1BGD 1ECH 3HNK 7DJU, **Ks** 5JVF 8YSO, **WAs** 2FUL 3AZI 4SQI 5IPM 6WTD, **WBs** 2JGI 2MJD 6CUU 6KPN 6KVA 6MEQ, **WNs** 2OLD 0KDS; (80 c.w.) **Ws** 1BFD 7DJU, K5JVF and reporters still to file.

Where:

HEREABOUTS — "QSLers of the Month" in the usual abundance include CM1AR, CO1AF, CRs 6EI 6GS 7FR, CT1GE, DJs 9LJ/M1 0LDA, EL2AE, EP2RC, ET3USA, FG7XX, FH8CD, FO8AQ, FR7ZD, HB9TE, HIs 3AGS 8XAL, HKs 4ALE 0AI, HRs 3JP 9EB, I1AZ, K6QYK/VO2, KA2KS, KG4AM, KH6s EWA FJH, KP4BPW, KS6BO, LA7MC, LU5AQ, OE1KGW, OH0NI, OR4VN, TF2WIO, TG0AA, VE8GM, VP7NS, VU2LE, W1EVT, YJ8BG, YNs 1MAN 3KM, YV3LD, ZD8s HL JC, ZL1PA, 5N2JWC, 6Y5MJ, 9H1AB, 9J2IE, 9K2AD, 9M6LX and 9Q5PA. Their quick confirmations inspired nomination by "How's" correspondents Ws 1BPM 1ECH 2ADP 7VRO, Ks 4MYO 5JVF 5SGJ 7YDZ 0TYO, WAs 2HIU 2WOR 3AZI 4HVC 5IIS 6WTD 8HDM, WBs 2LSV 6CGL 6MEQ, WN7s BOA BOB, KA7DR, J. Meirose and L. Stewart. Also mentioned in dispatches is the sterling work of QSL agents Ws 2CTN 4UWC 6BCT 9WHM, K4WVX and WA2WUV. Anyone missing in this salute? . _ . _ . Help! W1BPM can't seem to coax a card out of OY8KR, W1ECH likewise from MP4MAH '64, W8AFN is frustrated by VR3S '62, K8YSO needs a nudge toward '62's ZM6AW, and WA4SSM hunts hints on FY7YJ and 9A1FZ . _ . _ . _ WB6GVI, contrary to some periodicals, handles nobody's DX QSLs as yet. He's willing, though, and so are Ks 1QGC 2LSX 7BHJ 8YSO, WAs 2WOR 8HDM and WB2LOK . _ . _ . _ Here's a rundown on QSL availability through the stables of Hammarlund DXpedition, P.O. Box 7388, GPO, New York, N. Y., 10001 (self-addressed stamped envelopes required): CR5SP, March 1, 1965, to present; F9RY/FC, July 2-19, 1963; F9UC/FC, July 2-19, 1963; G3AWZ, May 1, 1963, to present; HZ2AMS, October 21, 1963, to August 31, 1964; HZ2AMS/8Z4, April 18-21, 1964; HZ2AMS/8Z5, April 3, 22-26, 1964; I1RB, March 1, 1965, to present; I1RB/IS1, June 24-30, 1964; K2JGG/JY, December 15-26, 1964; KG6SZ, Sept. 14-20, 1964; MP4MAP, September 13-19, 22-24, September 28 to October 2, 1963; MP4MAP/HZ, October 12-19, 1963; MP4TAX, September 10-12, 25-27, 1963; OH2AH/0, January 11-31, August 16-23, 1964; OH2YV/0, January 11-31, 1964; VK9BH, June 23 to July 19, 1963; VK9DR, September 9, 1963, to present; VK9MD, December 5, 1963, to present; VK9XI, December 16, 1963, to present; VP7NY, April 1, 1964, to present; VP8HF/VP8, March 6-22, 1964; VR1N, May 14 to June 21, 1963; YV8AJ, May 14-21, 1964; YV9AA, October 24 and November 28-29, 1964; YV0AA, Novem-



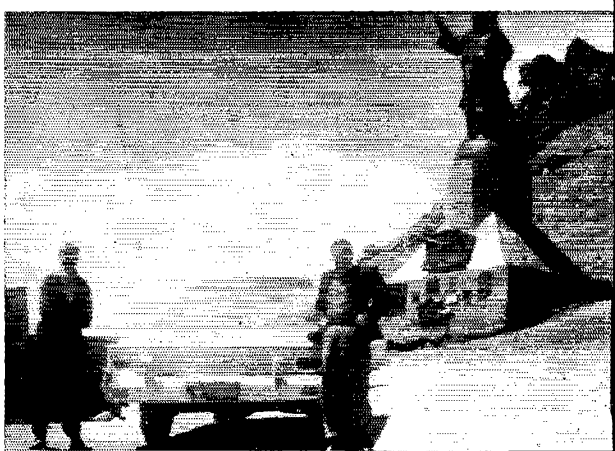


OR4VN, operated by ON4VN at King Badouin base in the Belgian antarctic, long has been an unusual catch for DX-chasers world wide. At upper left Henri checks out the big rig, next supervises erection of a three-band cage vertical, and then settles down to answer the clamoring W/K/VE pack. (Photos via W8IV)

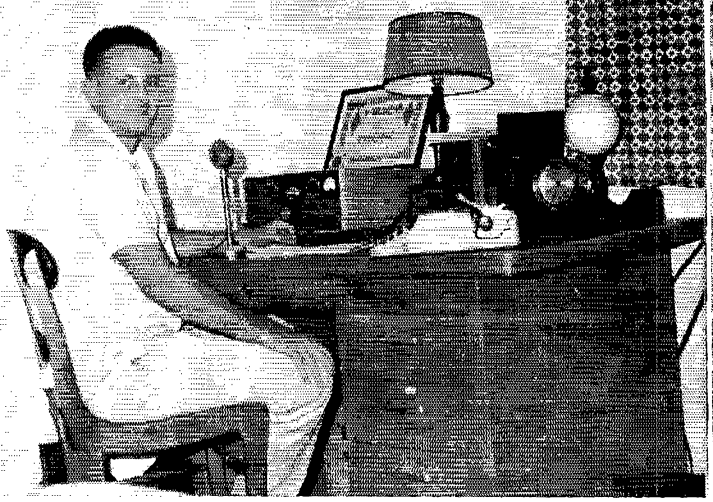
ber 8-10, 1963; YVØAA/mm, October 24-28 and November 7-11, 1963; ZD6I, July 4-5, 1964; ZD6PBD, December 21, 1963, to July 21, 1964; 6Y5LK/VP5, October 10-18, 1964; 7G1L, August 5, 1964, to present; 7QDI, July 6-7, 1964, 7Q7PBD, July 22, 1964, to present. Gus's AC-H QSLs for 1965 QSOs also are obtained through W2GHK & Co. as most of us are aware . . . . . OX3WX, through governmental clerical error, fears many QSLs have failed to reach him. His current address follows, or you can reapply through the EDR (Denmark) bureau . . . . . "QSLs will be out very shortly for CEØXA," guarantees W4DQS, "but only to those whose cards bear GMT." Fair enough, especially inasmuch as some 6,5 San Felix kiloQSOs are involved . . . . . "I've served YV5BNR as QSL manager since December, 1964, and I also help with cards for his son, YV5AAQ." This from WA6WTD who may be able to assist toward YV2AH confirmations as well.

ASIA — "UL7s IP IR IT and KDM QSL 100 per cent and always await W/K calls," assures SP5AFL . . . . . Ain't no VS6 three-letter calls, according to VS6BJ of HARTS despite spurious May indications to the contrary. And the call VS6AO hasn't been assigned since 1950 . . . . . Lack of advance publicity raised some eyebrows but G2MI tells W1YYM that HZ1AT/8Z5's springtime surprise seems quite okay . . . . . "If anyone wants faster service than that provided by bureaus I will reply direct in response to self-addressed stamped envelopes," offers KA2SR (WØIDF.) . . . . . "I'm now permanently in G-land," notifies ex-MP4BBE. "Have plenty of blank QSLs but they are at present on a boat between here and Bahrein. By June I will set about answering all cards received. I was active as MP4BBE since 1952 but with various absences from the island." . . . . . It's OD5BZ, not OD5BX, who engages W8ZCQ as QSL aide . . . . . "QSLs for W/K QSOs with 9M4JY after February 2, 1965, should be addressed to K9BPO," says the latter . . . . . "I've still got plenty of 5A3CJ and MP4BEQ QSLs," hints Steve Gibbs, awaiting assignment of a 5Z4 call in Nairobi at the address in the list to follow . . . . . HL9TY reminds W1AKY that International Reply Coupons are not convertible through Army Post Office addresses . . . . . MP4TBM warns of a five- or six-month delay in QSL response if the bureau route is used, for he expects to be leaving Sharjah shortly.

AFRICA — W1WPO of the ARRL DXCC Desk passes word that W4HKJ handles W/K QSLing for 6O6BW. "He has logs from April 17, this year, but will try to confirm QSOs for previous dates." . . . . . FL8AK (K1QHP) affirms, "My QSL manager is K7UCH and we are requesting self-addressed stamped envelopes, or s.a.e. and IRCs, with all cards." . . . . . "I'm the new QSL manager for TL8AC," announces W8VQM, specifying the customary s.a.s.e. courtesy . . . . . EL2C-DJØMF QSOs as far back as 1962 can be shipped through W4KZG. He's K4ZFX when Stateside, and adds, "My cards may be a little tardy on comeback since I may not get to work on them until August."



LUs 4AAR and 3AAT, left and right, with LU7AAG who is not shown, recently wheeled a 10-watt rig up, up, up and up to the Christ of the Andes monument. At this breathless altitude, some 12,000 feet a.s.l., the trio enjoyed many a DX QSO on 20 phone. As an added attraction they assisted in the safe landing of a passing airliner that had developed engine troubles.



TL8SW enjoys popularity as the most active DXer in the Central African Republic. At right (l. to r.) is the entire C.A.R. ham population, TL8s SW AE and AC. (Photos via W1BPM)

EUROPE — OH0NC communicates, "Please inform your members that QSLs for OH0 amateurs now may be sent via OH0 QSL Box, Box 1, Mariehamn, Finland." . . . . "I served TF2WIU as QSL manager only from April to September, 1964," clarifies WA6WTD. Dennis is getting inquiries re later QSOs which lead him to believe somebody besides operator Jerry has inherited the call. WA6WTD also will issue QSLs for HB9XJ/mm after the latter's return to Switzerland in about three months . . . . . ARRL Assistant Communications Manager W1YYM has it that EI4AK knocked off in May for return to W2PCI where QSLing will be completed in response to s.a.s.e. . . . . W1BPM says old ZB1RM now signs 9H1R after the Malta prefix switch effective in mid-April. Note that suffixes apparently also were shuffled . . . . . "I1AZ must have really meant it when he said I was his first Oklahoma QSO," remarks K5JVF. "Received his card just 82 hours after QSO, complete with s.a.e. and IRCs."

OCEANIA — 5W1AG QSLs will be issued through K6EXO to qualified applicants who stick to Greenwich Mean Time reference and supply s.a.s.e. Verily, GMT is the *only* practical time tool for DX work . . . . . KS6BN, whose changed QTH appears in the addresses to follow, promises thorough QSL action in reply to W/K cards accompanied by s.a.s.e. . . . . KR6JZ confirms that W2CTN handles his cards for QSOs on and after March 8, 1965. WA8ECH may be able to help with earlier KR6JZ contacts . . . . . "I closed down in December, 1964," records ex-VR2BC, also ex-VP2GI-VP1GG, "and am not quite settled here in VK-land. I'm still getting QSLs forwarded from the Fiji bureau. Please give publicity to the fact that they will be answered as soon as I am settled and have received all goods and possessions which are still in VR2 storage." This should be soon, assures Greg, awaiting his VK2 call at the same time . . . . . Now let's tabulate individual items suggested by "How's" clientele, remembering that each specification is necessarily neither complete, accurate, nor "official". . . .

BV3HPT, Box 11, Hsintien, Taiwan
CO2HK, P. Hernandez, P.O. Box 6140, Havana, Cuba
CR8BH, Hammarlund DXpedition, P.O. Box 7388, GPO, New York, N. Y., 10001
DJ6SI/LX/p (to DJ6SI)
DJ7UG/LX (to DJ7UG)
DJ8RR (via DL1TA)
DU3PAR (via PARL)
EA6URE (via URE)
EI4AK (to W2PCI)
EL2AE, Monrovia Dept. of State, Washington, D. C., 20521
EL2C-DJ0MF (via W4KZG)
EL8X (via SM5AIO)
ET3DR (via K8KLV)
ET3RS, M. de Henseler, UN ECA, P.O. Box 3005, Addis Ababa, Ethiopia
F7GM, Box 3203, APO 10, New York, N. Y.
F0RK/FC (to ON5LX)
FG7XT/FS7 (via K5AWR)
FK8BG, Box 97, Noumea, New Caledonia
FK8OO, Box 837, Noumea, New Caledonia
FL8AK (via K7UCH)
FU8AG, J. Gavarone, Box 104, Espiritu Santo, New Hebrides
GB2-4ITU (via RSGB)
HB9XJ/mm (via WA6WTD)
HC2EH, Box X, Guayaquil, Ecuador
ex-HH2P-ZP5DD (to VP3AA)
HI3AGS, A. Sabrino, Box 386, Santiago de los Caballeros, D. R.
HI8MMN (via W2CTN)
HI8RVD, Rafael E. Viguera Duran, P.O. Box 145, San Cristobal, D. R.
HL5X-6N5X (via W6ZY)
HS1F (via DJ7DD)
HS3RP, P.O. Box 2008, RAST, Bangkok, Thailand
HZ1AT/8Z5 (via G8KS)
HZ3TYO/8Z5 (via W1RAN)
IP1ZGY (via IT1TAI)
K3YMP/KM6 (via KM6BI)
K6QYK/VO2, B. Negus, P.O. Box 232, Goose Bay, Labrador
K0INR/KM6 (via KM6BI)
KA2SR, S/Sgt. S. Reynolds, Det. #5, 1956th Comm. Gp., APO, San Francisco, Calif. 96267
KA9AS (via WA6WTD)
KG6IG (via W3KTY)
KH6FBJ/KJ6 (to KH6BFJ)
KR6UL (via OARC — see *Callbook* bureau information)
KS6BN, R. York, Box 87, USPO 06-50000, Canton Island, So. Pacific via Honolulu, Hawaii, 96901
KS6BN/KB6 (to KS6BN)
ex-LX3BD (to DJ6SI)
LZ1KAA, Kodluduj 52, Sofia, Bulgaria
ex-MP4BBE (via RSGB)
ex-MP4BEQ-5A3CJ, S. Gibbs, P.O. Box 19031, Nairobi, Kenya, E. Africa (or to W5EBJ)
MP4TBO (via VE1AKZ)
OA4MX (via RCP)
OA8T, L. Lance, Box 2492, Lima, Peru
OD5BZ (via W8ZCQ)
OD5CN (via K4ISV)
OH2AM/OH0 (via W2CTN)
OX3WX, A. Holm, Cape Tobin, Greenland (or via EDR)
PY8TK (via LABRE)
SM6AMD (via W1YNE)
TA2BK (via DJ2PJ)

OH1AG's activity proves that it doesn't take many DX men to make a livewire DX club. OH1s WY VA and VB, left to right, constitute the entire membership. OH1AG is regularly workable on c.w., s.s.b. and a.m.

QST for

TF2WIU (see preceding text)
TL8AC (via W8VQM)
TR8AD (to K2LAF)
TZ1A (via W2CTN)
UA1KED, c/o E. Krenkl, RAEM, Chapligin St. 1-A, Moscow, U.S.S.R. (or via CRC)
UA6BV, B. D. Pavlov, P.O. Box 112, Krasnodar, U.S.S.R.
UL7IR, B. Fomenko, Aktyubinsk, Pobeda 20a/11, Kazakh S.S.R., U.S.S.R.
VE7BFN/VE8, D. Green, P.O. Box 130, Yellowknife, N.W.T., Canada
VE0MY, P.O. Box 850, Halifax, N.S., Canada
VK2KJ (via K7s RJK or QOL)
VK4TE/Willis (to VK4TE)
ex-VK9LA (via VK6RU)
VK0GW (via VK6RU)
VP2AX, E. Phillip, P.O. Box 337, Antigua, B.W.I. (or W/Ks via W8WFB)
VP2s SK SM (via W3AZD)
VP3AA, D. Packard, c/o U.S. Consulate General, Georgetown, Bt. Guiana
VP7CC (via K6UTO)
VQ8BFA (via G8KS)
VR1S, P. Dunbar, Box 288 or 377, Suva, Fiji Islands
VR2ET (via VK6RU)
VU2DIA, B. Hegde, ATMO, Interpolice Wireless, Port Blair, Andaman Islands
W5CGI/KH6 (via W5PSB)
W9FKL/KJ6, E. Cousert, APO, San Francisco, Calif. 96305
XV5X (via W6ZY)
YJ8BG, P.O. Box 93, Santo, New Hebrides
YS1LHM (to WA8LHM)
YV5CEY (via W3HNK)
YV5EG, F. Salazar, Box 47, La Guaira, Venezuela
YV9AF, P.O. Box 18, San Fernando de Apure, Venezuela
ZD7GP (to GW3LXI)
ZD7IP, G. Barrett, Longwood Farm, St. Helena
ZD8JC, J. Makeever, RCA Ascension Telemetry, PAA/-GMRD, Box 4187, Patrick AFB, Fla.
ZD8TV (via G3SNN)
ZL3VB (via ZL2GX)
4X4HW (via K4WMB)
4X4s RD UH (via W3HNK)
5N2AAI, via Box 27, Jefferson, Iowa
5W1AG (via K6EXO)
5Z4IR, Maj. R. Jarvis (G2BPC), P.O. Box 3071, Nairobi, Kenya, E. Africa (or via RSEA)
6O6BW (via W4HKJ)
9G1FR, P.O. Box 3773, Accra, Ghana
9H1AB, Flt. H. Howells (G3POB), RAF, 3 St. Nicholas Flats, Ta' Xbiex Wharf, Msida, Malta, G.C.
9K2BY, P.O. Box 146, Kuwait
9L1JR, J. Richardson, P.O. Box 53 or 907, Freetown, Sierra Leone
9M4JY (see preceding text)
9M6s AB AC (via W7PHO)

The preceding catalog comes through the generosity of **Ws** 1BGD 1BPM 1ECH 1IKE 1RAN 1VG 1WPO 1YYM 2ADP 2SZ 7UVR 7VRO 8YGR 9RCJ, **Ks** 1QGC 1QHP 3HGX 5JVF 6RXK 7RJK ØJPL ØSAJ, **WAs** 2KIZ 4HVC 8GYX 9AQE, **WBs** 2LSV 6AKZ 6CGL 6MEQ, **DJs** 6SI 8GN, **GW3TSH**, **SP5AFL**, L. Stewart, Columbus Amateur Radio Association *CARAscope* (W8ZCQ) DARC's *DX-MB* (DLs 3RK 9PF), DX Club of Puerto Rico *DXer* (KP4RK), Far East DXploiters *Bulletin* (JA1BN), Florida DX Club *DX Report* (W4LVV), International Short Wave League *Monitor* (12 Gladwell Rd., London N.8, England), Japan DX Radio Club *Bulletin* (JA1DM), Long Island DX Association *DX Bulletin* (W2FGD), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N. Y.), North Eastern DX Association *DX Bulletin* (K1SHN, W1BPW), Northern California DX Club *DXer* (Box 608, Menlo Park, Calif.) Ontario DX Association (VE3FXR), Puerto Rico Amateur Radio Club *Ground Wave* (KP4DV), VERON's *DXpress* (PA0s FX LOU VDV WWP) and West Gulf DX Club *DX Bulletin* (W5IGJ). Got any tidbits in *your* archives to help the boys along?

Whence:

SOUTH AMERICA — LCRA announces an Independence of Colombia DX Contest due to run from 2400 GMT, Friday, July 16th, to 2400 on the 18th. The objective for non-HKs will be to work as many HKs and HK call areas as possible, swapping the usual RS- or RST001, etc., serials at three points per QSO (no crossmode work allowed). Final score is ascertained by multiplying this point total by the number of HK band-call areas collected. Logs, a separate sheet for each band and mode, go to 20 July Contest, LCRA, Box 584, Bogota, Colombia, and must be postmarked no later than October 20, 1965, to be eligible for possible certificate awards. Good fishin'!

ASIA — VS6BJ of Hongkong Amateur Radio Transmitting Society lists current 14-Mc. c.w. actives VS6s FB FC FE FF FJ FK FL FO, and s.s.b.ers AJ AZ BE EK and EQ. VS6DS will try single sideband soon . _ . _ . _

JT1AG, Mongolia's most active DXer, is a prime mover in the M.P.R. amateur radio boom. Dambi, mainly a c.w. hound, keeps QRP a.m. phone available to oblige the voice DX gang and often is found on 14,040 or 14,060 kc. at 1200–1300 and 0000–0100 GMT.
(Photo via K2UYG)

OD5AX (W3ACE) will move to duty in Tehran, according to W1YYM. You may remember him as YA1AM and YI2AM . _ . _ . _ WA6IVM reports JA1BAR, graduated from Lehigh U., back in Japan with his civil engineering degree. Also that well-worked JA1ADN was married in April, a development in the life of a DX man that usually curtails DXing for a while. WA6IVM now has worked 2250 different JAs in 260 confirmed cities . _ . _ . _ VE1AKZ says MP4TBO should be much more workable with a new beam and 75-watter on c.w. and s.s.b. Roger likes 7 and 21 Mc. best . _ . _ . _ "4X4s RD and UH, very active on the low edge of 40 c.w., will try s.s.b. soon," writes W3HNK . _ . _ . _ W6ZY hears that W2AYN (EP5X-EQ5X-HL5X-6N5X) will be signing XV5X from Saigon . _ . _ . _ W1RAN notes that W1AW bulletin-watchers got on the inside track for HZ3TYQ/8Z5 QSOs in May. Better keep an ear on the ARRL Hq. station, OMs . _ . _ . _ "UL7IR wants to exchange letters with W/Ks desiring to learn Russian," advises SP5AFL. "He wants to improve his English, is 29 years old and a mining engineer." Boris's address appears in "Where" . _ . _ . _ KA2SR (WØIDF) nurses 50-kw. gear near Tokyo when not chasing DX on the ham bands . _ . _ . _ 9M4JY says he could work a lot more W/K/VEs if the annual ARRL DX Contest were held in May or June. Poor early-spring conditions for North America out Singapore way . _ . _ . _ "I made about 6000 QSOs with more than 200 countries, mostly using c.w. on 3.5 through 28 Mc., before closing down in January," says ex-MP4BBE. "Also managed about fifty countries on phone. I ran no more than 60 watts to dipoles, a ground-plane and, for the latter part, a 14-Mc. 2-element beam." . _ . _ . _ WA6WTD finds KA9AS, the only active c.w. man in his call area, very audible on 20's low edge around zero GMT. Dennis also notes that UA0s DJ and KIA have YLs at their keys, and that HL9KB is W4RKP when back home.

AFRICA — "Kenya certainly is a lot different from Bahrein," observes ex-MP4BEQ-5A3CJ, awaiting his 5Z4 credentials in Nairobi. "There seems to be some hold-up in the issuance of new licenses here. I hope it won't be much longer, for the rig is all ready to go. The hams here in East Africa have been helping out with communications for the annual Safari Motor Rally, and I've been lending a hand with the headquarters station at city hall." Steven works in airport ground radio and radar . _ . _ . _ W3HNK says 5A5TR will shut down next month. Meanwhile he's regularly available Sundays near 21,395 kc. at 1530 GMT. Joe also notes that ZE4JS is about to hit s.s.b., a rare commodity in Rhodesia . _ . _ . _ ZD7GP has about three months left on St. Helena, according to

(Continued on page 158)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* WIFZJ

432-Mc. Moonbounce Test, July 3–July 24

JULY 3 from 1942 to 2217 GMT, the 1000-foot reflector at Cornell's Arecibo Ionospheric Observatory in Arecibo, Puerto Rico will be available for amateur radio moonbounce tests. The test will start at 1942 GMT with a two-minute c.w. CQ signing KP4BPZ. The transmitting frequency will be 432.000 Mc. Receiver-tuning range is 431.980 to 432.100 Mc. In an effort to keep the frequency clear of interference, calling stations are requested to operate between 432.010 to 432.100 Mc.

After initial c.w. contact has been established, KP4BPZ will switch to lower s.s.b. and will tune for any calls with particular emphasis on establishing two-way voice contact. On the first test last year, KP4BPZ was able to copy the 85-watt (output) a.m. phone signal from W1BU. The receiver this year is considerably more sensitive and it is anticipated that they will be able to copy an s.s.b. signal of 100 watts into a moon-aimed 15-db.-gain antenna.

Due to the relatively short moon time available (2.3 hours), contacts should be limited to an exchange of call signs and reports. As a rough guide to finding the moon, the antenna can be aimed 12.5° below the position where the sun will be at 1516 GMT on the second or third of July. On July 3, the moon should pass the center of such an antenna at 1942 GMT. Naturally (depending on your beam width) it will be necessary to keep moving your antenna to keep it on the moon. (The moon moves roughly 14.5° per hour.) Inquiries concerning the operation should be addressed to KP4BPZ, P.O. Box 995; Arecibo, Puerto Rico.

Project Back-Up

In the last moonbounce operation from Arecibo, many prospective contacts were missed due to the short lead time. In an effort to pick up those who missed out on the first schedule due to open feed lines, shorted matching sections, etc., a second schedule is planned for July 24. The same operating procedure will be followed. Transmissions will start at 1110 GMT and will continue until 1404 GMT. In this case, the moon will be found approximately where the sun was on the preceding day at 1510 GMT.

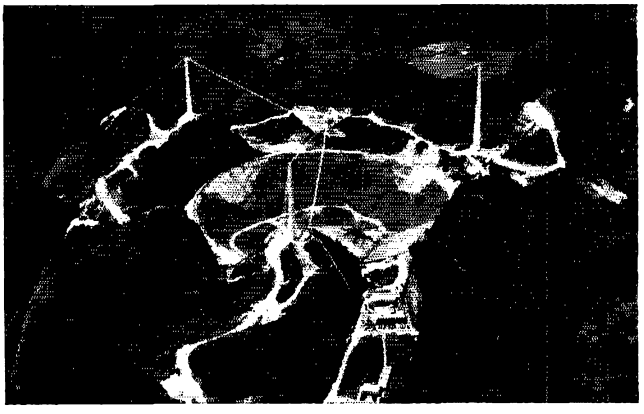
V.H.F. At the National Convention in July

After looking at the VHF Program for the National Convention to be held on July 2–5 at San Jose, California, seems that once again the ARRL National will include an outstanding v.h.f. Convention. Many v.h.f.ers known to you and me will be giving interesting talks and included among them are outstanding authorities on all phases of work on the v.h.f.

The annual West Coast V.h.f. Conference, antenna measuring contest is one of the many things scheduled for the program. This contest gives the amateurs an opportunity to measure the actual gain of their favorite 432- or 1296-Mc. antenna using calibrated laboratory equipment. Prizes and trophies will be awarded to the antennas measuring the highest gain. The antenna must be able to be supported by one person and have a 50-ohm type "N" feed point.

This V.h.f. Convention must turn out to be one that you "just can't miss."

* P.O. Box 1738, Arecibo, Puerto Rico 00613.



This 1000-foot diameter antenna will be used for an amateur radio experiment July 3.

144 Mc. & Up

The only report received this month concerning 1296 Mc. was the one received from K2RDX. John sez that the 1296 Mc. paramp built by Pete Gagney for the Manhattan College Moonbounce Project, looks very good and will probably be tested during May. John will let us know how things turn out. From WB2OSA in Syracuse, New York, we learn that W2HIL is now interested and probably working on equipment for ATV; and out in Michigan WA8DXW is working on a low-powered TV transmitter-modulator for 440 Mc. ATV while W8WNX is building a new sync. generator for ATV. At Nashua, New Hampshire, WIQKA seems to be doing enough experimenting, building and operating to keep ten hams busy. Among other things, Rolly is building a paramp for 432 Mc. after completing the wiring of the main receiver section for 2415 Mc. Modification to tune lower and calibration of W. E. surplus absorption type wavemeter for 2350–3450 Mc. is in process, and he's investigating waveguide-type crystal mixer for 3300, 5650 and 10 KMC. He's also investigating klystron and magnetrons for application and availability for the 5650-Mc. band and is open to all suggestions concerning this project. Final project is construction of parabolic-dish feeds for the 3300 and 2415 Mc. bands. What do you do in your spare time, Rolly? Ed Parker, K2HQL writes that activity is rapidly increasing on 432 Mc. in the greater Philadelphia area. "It is now possible to make contacts most any night of the week and unofficial meeting time is between 2130 and 2200 EST. Quite a few of the fellows are heard regularly." Ed goes on to say that W3CGV represents Delaware and W3GGR represents Maryland and both are very active on 432 Mc. W2MDE's c.w. signal can be copied at almost any time in the Philadelphia area but his f.m. signal requires better than *normal conditions* to be copied. K2HQL is presently building gear for 1296 and is planning gear for 2300 Mc. From WA4FJM, we learn that W4HJZ and W4FDO have rigs going on 432 Mc. and that W4FDO is also ready on 220 Mc. K4QIF writes from Salisbury, North Carolina, that on May 4, W4GJO (600 miles) in Florida was heard S5 for three minutes on 432 Mc. However, Grid faded back into the noise before contact could be made. Rusty sez that his high-power rig for 432 Mc. is now completed and runs about 800 watts to a pair of 4X150's. 432 Mc. paramp is still working fine sez he. Gurdon, Arkansas is represented on 432 Mc. by W5JWL, who runs 45 watts output, antenna system is 128-element colinear fed with gas-filled coax and is about 55 feet high. Converter uses a 416B front end. Jerry has worked six states to date on 432, but hopes to soon be running a kw. on that band. W5SWV sez that 432-Mc. activities are growing in his area (Denison, Texas) with five stations now active. Out at La Mesa, California W6IEY observes that good inversions have been occurring toward the north with best conditions noted on April 22. Lou has recently completed a varactor tripler, two meters to 432 Mc., using an MA4060A. Sez it works good. K7ICW sends word concerning the first Utah/Nevada QSO on 220 Mc., made with K7RKH/7 operating at Castle Cliffs, Utah at a 4000-foot elevation. It was a c.w.-contact with RST 5-4-9 both ways and was also the first out-of-state QSO on 220 Mc. from Utah. Al also tells us that construction of 432-Mc. "beer can" baluns was most difficult because of the scarcity of the proper type of beer cans. Up in the Province of Ontario, two of our friends are looking for skeds on 432 Mc. Write to VE3BQN and VE3BPR to obtain same.

K1PSR and K3DNO are both working on gear for 220 Mc. Nick (K1PSR) is working on a transmitter using a 2C51, 5763, 6360 and an 8458, and hopes to get 28-watts output. Ken, K3DNO is working on a converter for 220 and hopes to have it completed soon. Word from New Mexico and K5TQP sez that first skeds held with WØEYE on 220 Mc. were unsuccessful. Fred tells us that the transmitter and receiver appeared to function normally, but the s.w.r. on the temporary antenna was too high. Next sked in the middle of May and he's hoping that the new collinear array will be ready for use at that time. WØEYE operates on 220.050 Mc. K5TQP can be found on 220.300 Mc. From K8UQA in the Cleveland, Ohio area we hear that 432-Mc. activity is growing quite fast and that K8OXZ, W8DQU and W8IJG are all looking for skeds on that band. Dave sez that stations from Toledo and Detroit are getting into Cleveland quite regularly, but little luck is had with stations to the east.

RTTY is the word at New Brunswick, New Jersey where WA2OOD is hoping to purchase a Model 15 in the near future. WB2MMM recently purchased a Model 15 and is hoping to get a Model 19 shortly. These boys will probably be RTTY on two meters. Tom, WB2KLD, comments that 144 Mc. was generally good throughout April with the 17th and the 22nd being best. On those dates, he heard stations in Pennsylvania, Massachusetts and New Hampshire. K3CFA also mentions the 17th as being better than normal for 144 Mc.; and K3KAP at Corry, Pennsylvania sez there was an opening to Michigan and the midwestern states on April 29. Delaware is represented by K3OBU who sez that conditions seem unusual on 144 Mc. in that there hasn't been a single-band opening for three months. However, during April, Joe did work K1UNV, K2MHJ and W1BFW under average conditions. He'd like skeds, either m.s. or ground wave during the summer months. Rusty, K4QIF, writes that conditions were above normal in North Carolina on twelve days during April to the northwest and were good to the south on April 22 and May 4 and 5. May 2 was a big day for Rusty when he worked K5WXZ in Garland, Texas for state #29 on 144 Mc. We hear from K4TAX that he now has 40 elements up 65 feet for 144 Mc. and his frequency is 144.12 Mc. Bob can always be found on that frequency on Monday and Tuesday nights between 1900 and 2030 CST and sometimes on other nights of the week. He usually tunes 144 to 146 Mc., listening for calls from all directions. W4WNH, who keeps Germantown Kentucky on the the two-meter map, writes that m.s. skeds were good during April. On the 21st, he worked K4NTD for his first Kentucky contact. If you're looking for Kentucky on 144 Mc., you might be looking for Shelby at the following times when he calls CQ for five minutes on 144.099 Mc.: CQ SSE at 0805 each morning; CQ NW at 2130 & 2250 nightly; CQ SSE at 2145 nightly; CQ NE at 2220 nightly. From Florida, WA4BMC mentions an opening on April 9 but she doesn't tell us what she heard or worked; and W4FJ in Virginia sez that conditions were normal on 144 Mc. during April except for the night of the 22nd when VE3D1R answered his CQ with an S7 signal. From New Mexico, K5TQP reports that on April 29 he and WØEYE had their best two-meter QSO to date when they chatted for about 32 minutes without ever losing each other. Fred also tells us that K5PGI and K5UCB are now s.s.b. on 145.44 Mc. W5SWV reports that activity on 144 Mc. has

been exceptionally good during the past winter with at least fourteen stations being active at all times. W5LGW tells of a trip made by himself and W5NTX to the McDonald observatory (7000 feet) where six- and two-meter equipment were set up. No six-meter contacts were made but two meters "was a pipe line back to Odessa and W5LID." California is well represented once again in reports received. W6ARQ writes that he has built a coaxial filter for two meters and is working on a 14-Mc. s.s.b. source for two-meter s.s.b. WB6IZF tells us that on May 1, WB6IJB had a two-way a.m. contact with K5HMN/KH6 on 144 Mc. with the portable station putting a 5/4 signal. Bill is wondering if "it's true" or if it's a case of someone "playing around." We can't be sure, Bill, but the same station has been reported as aero-mobile. Ed (WB6IZF), also observed good conditions on two meters on April 20 and from the 27th through the 29th. From seldom heard Oregon, W7GWT writes that there are over 200 stations active on 144 Mc. (A3) within 25 miles of Portland. Seems like we ought to receive more 144 Mc. news from your area then, Chuck. How about some reporting? Al Olcott, K7ICW sez: "On April 13 on a p.m. sked with K7NII (Scottsdale, Arizona) signals built up good enough and I shifted to s.s.b. I heard an s.s.b. come back but it didn't sound like K7NII, it wasn't! On April 20 during a similar sked with K7NII, K7DGZ in Tempe, Arizona was piggy backing the circuit and managed a two-way s.s.b. QSO with him running 5/5 both ways. This in my knowledge is the first Arizona/Nevada two-way 144 Mc. s.s.b. QSO. On April 25 K7RKII/7 at Castle Cliffs, Utah was worked on two-way s.s.b. on 144 Mc. This is the first known Utah/Nevada QSO via this mode (but not for a 144 Mc. QSO)." Congratulations once again Al, to you and the other fellows involved! According to Joe, WA9MSD, conditions were "Wonderful, the last day of April and the 1st day of May on 144 Mc. when I worked a Milwaukee station about 120 miles away." The "different" part about this contact was that Joe was using his skeleton-slot beam in the attic. KL7EBB/9 reports that the r.f. linear for his 144-Mc. kw. rig has been completed. Circuit was designed by WA9FUO and Loren sez it's one of the best and simplest he's seen. For details write either KL7EBB/9 or WA9FUO. WA9BYF is presently working on a two-meter f.m. base station using a pair of 2E26s. Anyone else in that area interested in f.m. work? Maine and Vermont are two of the states with whom K9SGD would like meteor skeds on 144 Mc. Joe writes us that on April 18 he caught a fair aurora and worked W2AZL, K5WXZ, WA8KBJ and VE3EWZ, bringing his states worked to 33 on 144 Mc. Up in Wisconsin, K9DBR is ready for RTTY skeds on either six or two meters. Neil is also working on construction of an a.m./f.m. transmitter for 6 and 2, and hopes to have the 144-Mc. s.s.b. rig on the air during May. At Appleton, Wisconsin, W9FBC tells us that there is considerable interest in f.m. operation on 146.95 Mc. in that area. Six stations are operating, with three more awaiting crystals. Maury noted good conditions on two meters on April 30 when stations in the Milwaukee/Chicago areas were heard and again on May 5 when it was open to Northern Illinois and W9YOI was worked.

Bill, VE4GI, writes that on April 29, he copied KØCER (400 miles) in South Dakota but was unable to make a contact.

50 Mc.

So E_s has once again arrived on 50 Mc.! Reports are beginning to arrive by the bushel and we can't possibly publish all of them. Be patient! Have faith! Eventually we'll include your report, too!

The season arrived for VE4GI on April 18 and again on the weekend of May 1. Bill didn't mention what he heard or worked. He did however mention that some time ago he tried scatter work on 50 Mc. and was unsuccessful. Just recently he decided to try it again and this time he worked WØPFP (600 miles) and K9HMB (750 miles) on two successive weeks. "Didn't realize the fun I was missing." We're sorry to hear that Bill is "closing up shop and will move down south in August. Will try to work six-meter s.s.b. during the September contest from Wyoming or Utah. If someone hears me /Ø or /7 I hope they'll call." You can bet your boots, Bill! Did you purposely pick those two scarcely populated States? Good luck on the move and we'll be watching for you from the states.

220- and 420 Mc. STANDINGS

220 Mc.				*420 Mc.*			
W1AJR	12	4	480	W1AJR	12	4	410
W1AZK	9	3	412	W1BU	11	3	390
W1BU	14	5	600	W1HDQ	10	3	250
W1HDQ	12	5	450	K1JIX	9	3	230
K1JIX	11	4	615	W1MFT	8	3	170
W1OOP	12	4	100	W1OOP	11	3	390
				W1QWJ	10	3	230
				W1UHE	10	4	130
W2AOC	15	5	530				
K2AXQ	9	3	240				
WA2BAH	4	2	167	W2AOD	6	4	90
K2CBA	16	7	660	W2BLV	12	5	360
K2DIG	4	3	140	K2CBA	8	4	220
W2DWJ	15	5	740	WA2DTZ	6	3	200
W2DZA	12	5	410	W2DWJ	10	4	196
K2DZM	12	5	400	W2DZA	5	3	130
K2ISA	11	4	300	K2DZM	10	4	390
K2ITP	10	5	265	WB2EGZ	9	4	260
K2ITQ	11	5	265	WA2EUS	7	3	130
K2JWT	6	3	244	K2GGA	4	4	383
K2KIB	12	4	300	WA2HQF	8	4	280
W2LRJ	10	4	250	K2HQL	8	4	250
W2LWI	12	4	400	K2KIB	4	2	100
W2NTY	12	5	300	W2NTY	3	2	100
K2PPZ	11	4	400	W2OTA	10	4	300
K2QJQ	13	5	510	K2UUR	9	3	280
K2SEU	12	5	450	W2VCG	9	4	280
K2UUR	6	3	210	W2YPM	6	3	300
				WA2TOV	5	3	140
W3AHQ	4	3	180	K3CLK	9	4	
W3FEY	11	5	350	K3EOF	6	3	250
K3IUV	9	3	310	W3FEY	8	4	296
W3JYL	8	4	295	K3IUV	8	3	310
W3JZI	4	3	250	W3LCC	8	2	
W3KKN	10	4	255	W3RUE	7	4	410
W3LCC	10	5	300	W3SZD	5	4	300
W3LZD	15	5	425	W3MMV	5	3	240
W3RUE	10	5	480	W3UJG	4	2	350
W3UJG	13	5	400				
W3ZRF	5	4	112	W4HHK	9	4	550
				W4TLV	6	2	500
K4TFU	8	4	400	W4RFR	5	2	665
W4TLC	5	1	315	W4TLV	4	2	500
W4UYB	7	5	320	K4QIF	3	1	210
				W5RCI	14	4	725
W5AJG	3	2	1050	W5AJG	6	2	665
W5RCI	8	5	700	W5HTZ	5	3	440
				W5SWV	7	3	525
K6GTG	2	1	240	W5UKQ	3	2	500
W6MMU	2	2	225				
W6NLZ	3	2	2540	W6FZA	1	1	280
				K6GTG	1	1	180
				W8FYY	9	5	580
K7ICW	4	2	250				
W7AGO	2	1	160	W7LHL	2	1	180
K8AXU	11	5	1050	W8PT	11	5	400
W8IJG	9	5	475	W8YIO	9	5	450
W8LPD	6	4	480	W8IFX	8	5	470
W8NRM	8	4	390	K8AXU	5	3	660
W8PT	10	5	680	W8HCC	3	2	355
W8SVI	6	4	520	W8HRC	3	2	250
				W8JLQ	6	3	275
W9JCS	6	2	340	W8NRM	3	2	390
W9JEP	9	4	560	W8RQI	6	3	270
W9OVL	6	3	475	W8UST	3		25
W9UED	4	4	605				
W9ZIH	10	5	500	K9AAJ	9	5	425
				K9UIF	9	5	390
				W9AAG	8	4	525
KØDGU	5	3	425	W9GAB	9	4	608
KØITF	6	3	515	W9OJI	6	3	330
KH6UK	1	1	2540				
VE3AIB	7	3	450	WØIDY	7	3	430
VE3BPR	3	3	300	KØITF	3	2	158

The figures after each call refer to states, call area and mileage of best DX.

From New Jersey and New York reports indicate openings on 50 Mc. On April 28 and 30 and May 1. Ken, WB2JCP sez that on the 28th 4s and 5s were prevalent in the New Jersey area and WB2GKB worked into Mexico. WA2VYK and WB2HZY copied stations in Louisiana, Florida, Texas, Arkansas and Mississippi on May 1. Reports from 3 land (1 each from Maryland, Pennsylvania and DC) indicate that these boys heard about the same as the 2s. K3DNO in Maryland copied WA4BYR and WA4KYA in Florida plus WA5ETR in Texas on the 30th of April. Ken (K3DNO) sez: "Rumor has it that someone in the area of Baltimore has fed results of local 6-meter skip into a computer, with usable results. Prediction is for a wild nationwide opening July 5 or 6." Interesting! Hope it works out that way so we'll all be prepared! From Erie, Pa., K3ZGI noted the April 30 opening and he copied stations in Florida, Texas, Georgia and Alabama. K3YKC in Washington, D. C. also caught the opening of the 30th and heard Texas, Louisiana and Alabama. All with fair-to-good signals. "Big Mike," WA4BMC sez she's looking for some RTTY contacts on 50 Mc. during the contest. Hope she got 'em. Mike caught four states during the opening of the 30th, namely; Ohio, New Jersey, Pennsylvania and Kentucky. (Not on RTTY.) According to WA4EVQ six meters is "wide open" to the north, west and south, WA4WJW reporting KP4's frequently heard. One lone report from Alabama and K4FJZ notes that on the 29th a number of 5-land stations were heard. Kentucky is heard from through WA4GHQ who agrees with the east coast gang concerning the April 30 opening and sez that a Cuba station was running 40 over 9 at his QTH. Aurora is mentioned by WA4FJM who first noticed it on the low frequencies. "Found six crawling" sez he, "1, 2, 3, 4 and 8 lands being copied. Lots of phone signals but only a few of the s.s.b.ers seemed to be working out." Jim heard the Texans on April 29 but the opening of May 1 was a very good one for him with Texas, Arkansas, Oklahoma and Tennessee coming in.

"April went out in a blaze of *E* skip!" So goes the comment of W4WQZ at Kingsport, Tennessee. Texas and Florida were heard on the 28th and 29th, but like the other reports received, the 30th was the big day. "Opening started to Texas, swung to 0s (all 0s heard), hit Florida in the late afternoon with KP4s and VP7 heard. Some 1s, 2s and 3s heard plus VE2 and VE3." Guess that was a big one in Tennessee! Seven states and four call areas were heard by K4KYL at Knoxville on May 1st. John Deegan, WA4QLZ writes that the following KP4s were worked/heard on April 27. KP4BBU, KP4ONJ, KP4AKR, KP4BNP, KP4AEL, KP4BKT and KP4ANG. Looks like six-meter activity must be picking up down that-a-way, too. W2UZN/4 and W4UIS, both in Virginia, go along with the 30th being "The Big One." Jim (W2UZN/4), sez that between 2215 and 2330 GMT on the 30th, he worked into Florida, Louisiana, Kansas, Missouri and Alabama. Cal mentions that the band opened about 1000 and closed at 1930, then opened once again at 2030 and closed about 0100 on May 1. That's a lot of hours and a lot of talkin', John, W5JFB at New Orleans sez he hopes that contest weekend is as good as the opening of May 8. (We'll know by this time, won't we, John?) About 1630 CST on that day, John switched on his homebrew s.s.b. heterodyne exciter running about 50 watts p.e.p. and called several a.m. stations, with no success. He then went to the low end and called W3AZO, at Kensington, Maryland who had a 40 over 9 signal. Jack, W3AZO, runs 450 watts of s.s.b.

2-METER STANDINGS

W1REZ	32	8	1300	W5VY	10	3	1200
W1AZK	28	8	1205	W5BEP	9	3	1000
W1JSM	26	7	1330	W5EDZ	8	5	1375
W1AJR	25	7	1130	W5VYO	7	4	1330
W1KCS	24	7	1150	W5UNH	6	3	1200
W1MEH	24	6	1000				
W1MMN	22	8	1200	W6WSQ	15	5	1390
W1HDQ	22	6	1020	W6NLZ	12	5	2540
W1HZY	20	7	1080	W6DNG	9	5	1010
W1AFO	19	6	920	K6HMS	8	4	1010
K1CRQ	19	6	800	W6AJF	6	3	800
K1AFR	17	6	875	W6ZL	5	3	1400
				WB6KAP	5	3	1300
W2NLY	37	8	1390	K6GTG	4	2	800
W2CNY	37	8	1360	W6MMU	3	2	950
W2ORI	37	8	1320				
W2BLV	36	8	1020	W7LHL	10	4	1170
K2GQL	35	8	1365	K7NH	10	5	1220
K2LMG	32	9	1710	W7CJM	5	2	670
W2AZL	29	8	1050	K7ICW	5	3	1236
K2IEJ	27	8	1060	W7JIP	4	2	900
K2CEH	25	8	1200	W7JU	4	2	235
W2AMJ	25	5	960				
W2ALR	24	8	1100				
W2RXG	23	8	1200	W8PT	10	9	1260
W2PUA/2	23	8	1150	W8KAY	39	9	1210
WA2PZF	23	7	1200	W8IEX	39	8	1225
W2SMN	23	7	1090	W8SDJ	37	8	1220
W2LWI	23	7	1050	K8AXU	34	9	1275
K2HOD	23	7	950	W8LOF	34	8	1060
W2DWJ	23	6	860	W8SFG	34	8	1040
W2PAU	23	6	753	W8AVE	33	9	1155
W2FSX	21	6	750	W8YIO	32	8	1270
K2KIB	21	5	700	W8GGH	32	8	1180
W2UTH	20	7	880	W8BAX	32	8	960
W2WZR	19	7	1010	W8RMH	32	6	910
W2RGV	19	8	720	W8NOH	32	6	910
WA2EMA	19	6	1010	W8NOH	31	8	1090
WA2PZE	18	6	750	W8EHW	31	8	860
W2RLG	17	6	980	W8SVL	30	8	1080
WA2YXS	17	6	720	W8LPD	28	9	850
K2OEL	16	6	1010	K1CRQ/8	29	9	690
W2CCO	16	6	780	W8WRN	28	8	680
K2JWT	16	6	550	W8DX	26	8	720
				W8ILC	25	8	800
W3RUE	33	8	1100	W8WNM	25	8	900
W3BGA	31	8	1070	W8GEN	23	8	510
W3GKP	31	7	1180	W8LCY	22	7	680
W3TDF	30	8	1125	W8BLN	21	7	610
W3KCA	28	8	1110	W8NRM	17	7	550
W3BYF	28	8	1070				
W3FPH	22	8	1110	W9WOK	42	9	1170
W3LST	22	6	800	W9KUR	41	9	1160
W3LNA	21	7	720	W9UIF	41	9	1150
W3NKM	20	7	730	K9AAJ	36	9	1200
W3LZD	20	7	650	W9AAG	35	9	1050
K3OBU	19	7	930	W9GAR	34	9	1075
W3MFT	19	6	600	K9SGD	33	9	1100
K3OBW	17	7	930	W9OII	32	8	1090
W3HHC	16	6	550	W9REM	31	8	850
K3CFA	16	6	600	W9ZIH	30	8	830
K3HDW	12	6	1015	W9PBP	28	8	820
				W9LVC	27	8	950
W4HJQ	38	9	1150	W9OJI	27	9	910
W4HHK	37	9	1280	W9IFA	26	6	1000
W4WNH	35	9	1350	W9RPV	25	7	1030
W4LTU	34	8	1160	W9CUX	24	7	1000
W4ZXI	34	8	954	K9AQF	24	7	900
W4MKJ	34	8	1149	W9WDD	23	7	900
K4QIF	29	8	1000	W9LF	22	7	825
K4IXC	27	8	1255	W9KPS	22	7	690
W4MNT	27	8	1170	W9ALU	18	7	800
W4EJ	27	8	1050				
W4LVA	26	8	1000				
W4EQM	25	8	1010	W0BFB	43	9	1350
W4RFR	24	9	820	W0LFE	33	9	1040
W4TLV	23	7	1000	W0IHD	31	8	1030
W4JC	23	6	725	W0SMI	29	9	1075
W4RMU	21	7	1080	W0ENC	28	7	1250
W4OLK	20	6	720	W0QOH	27	9	1300
K4YYJ	20	6	720	W0IQV	27	8	1100
W4LNG	19	7	1080	W0RUF	23	7	901
K4MHS	20	5	800	W0MOX	23	6	1150
K4VWH	18	6	590	W0IC	22	7	1360
W4MDA	17	6	775	WA0DZH	21	7	1170
				W0TGC	21	7	870
W5RCI	39	9	1280	K0UTF	21	6	940
W5AJG	33	9	1360	W0INI	21	6	830
W5FYZ	33	9	1275	W0JAS	19	7	1130
W5JWL	33	7	1150	W0AZT	18	7	1100
W5DFU	29	9	1300	K0AQJ	16	6	1120
W5PZ	28	8	1300	W0IFS	16	6	1100
W5LPG	25	7	1000				
W5UKQ	24	8	1150	VE1CL	8	5	800
K5TQP	22	7	1250	VE3DIR	37	9	1300
W5SWV	20	5	960	VE3AIB	29	8	1340
W5ML	16	6	700	VE3BPR	24	7	950
W5KFU	15	5	1360	VE3BQN	23	7	1180
W5UGO	13	4	635	VE3AQG	18	8	1300
W5FSC	12	5	1390	VE3DER	17	8	1340
W5CVW	11	5	1180	VE3HW	17	7	1350
W5NDE	11	5	620	VE6HO	1	1	915
W5WAX	11	5	735	KH6UK	2	2	2540

The figures after each call refer to states, call area and mileage of best DX.

(Continued on page 166)

YL news and views

CONDUCTED BY JEAN PEACOR,* K1IJV

Sixteenth YL-OM Contest

If there is a licensed YL amateur radio operator alive who has yet to enter her first YL/OM contest, circle your calendar now for 1966. You've been missing a lot of fun. The dates are yet to be announced, but as the months of February and March approach, watch for the details and two pleasure packed weekends can be yours.

Evelyn Kinder, WB6CGA, and her OM Gene, WB6CFZ, have become avid hams since their introduction to radio via walkie-talkies in 1962. Using a KWM-2, Ev added 3rd place phone honors in the YL/OM contest to her long list of radio activities.

YLRL's Vice President and chief log-checker, Kayla, WØHJL, reports that comments on this year's contest from the OMs ran along these lines: "Had a wonderful time" — "The YLs are wonderful operators" — "The OMs can take lessons from the YL ops". Another comment was, "Where were all the YLs?" Statistics of logs submitted showed that OMs in the c.w. portion outnumbered the YLs by 153 to 63 and on phone, 57 to 35. Of course, many other stations participated and this ratio is based on logs received. Certainly, this shows the OMs' enthusiasm for this contest and it's the YLs who have the chance to maintain and increase this enthusiasm.

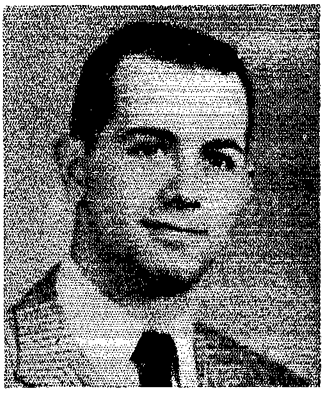
To win top honors in any contest takes outstanding skill and ability. To win first place in both the c.w. and phone portions of a contest is an even greater feat. Layne LaBaume, KØSLD, of Boulder, Colorado accomplished just that this year with outstanding scores in both portions, which may be a record first in the YL/OM contest.

Layne LaBaume, KØSLD, is YL/OM champ for 1965.

How do they do it? Upon request, some of the contest high-scorers kindly sent a few contest comments which may divulge a few secrets to such success. One word — enthusiasm — should preface all.

Layne, KØSLD, and former KW6DG, feels that good equipment, good antennas (he uses 40 meter phased vertical array, also, a 6 El. beam), knowledge of propagation conditions, previous contest experience, geographical location, and much patience in tracking down feminine voices on phone, or fists on c.w., were all helpful to him.

Jessie Billon, WA6OET, 1st place phone winner and 2nd place for c.w., compliments all the OMs for their courtesies. To remain calm no matter what must be a secret, since Jessie surmounted rig problems, a sticking keyer, a tube that went poof in her receiver right at the start



Centralia, Illinois, termed the center of population of the U. S. A. between 1960–1970, is the QTH of Kenneth Bauer, W9WGQ, who is 2nd place YL/OM phone scorer.

*YL Editor, *QST*. Please send all news notes to K1IJV's home address: 139 Cooley St., Springfield, Mass.

Feb. 20, Feb 21, 1965

YL Phone

	Contacts	Sections	Score
WA6OET, Jessie Billon	875	85	74,275
WA6EXX, Betty Lindsay	850	75	63,750
WB6CGA, Evelyn Kinder	533	75	39,975

OM Phone

K6SLD, Layne LaBaume	79	38	3,752.5*
W9WGQ, Kenneth Bauer	59	35	2,581.25*
W5NQR, Bill Allen	56	32	2,240*

Mar. 6–7, 1965

YL CW

	Contacts	Sections	Score
W3CUL, Mac Burke	158	84	18,090*
WA6OET, Jessie Billon	500	72	45,000*
W1YYM, Ellen White	492	89	43,788

OM CW

KØSLD, Layne LaBaume	93	45	5,231.25*
W5WZQ, David Blaschke	83	46	4,772.5*
K2EIU/5, Kenneth E. Keeler	80	47	4,700*

YL Phone

K1LCI	13,581.25*
K1GSF	1,753.75*
K1UZG	110*
K1USQ	37.5*
W2OWL	1,725*
K3TNL	30,957.5*
K3PKI	273
WA4FEY	21,228.75*
WA4HOM	16,605*
W4ZDK	4,995
K4LMB	1,500*
WA4VKG	1,275
WA4PDS	11.25*
WA5KEC	6,000*
W5NQQ	950*
WA6OET	74,375
WB6CGA	39,975
K6DLL	9,940*
K7KSF	23,562
K7RAM	22,402*
K7IVK	5,535*
K7ADI	2,722.5*
K8ONV	31,837
K9TRP	20,764
K9LTQ	10,434
K9LUI	9,800
W9KSE	315*
K9IWR	168.75*
WAØEXX	63,750
KØEPE	30,360
WØJUV	27,786
KØBTV	131.25*
VK3KS	470*
ZL2JO	9,990*
ZL1LD	206.25*

YL CW

W1YYM	43,788
K1IJV	26,815*
K1LCI	23,632.5*
K1UZG	23,152.5*
K1WZY	20,790
K1QFD	13,132.5*
K1NEI	5,940
WA2LOZ	17,327.5*
W2EBW	15,892
WA2CUZ/2	14,707.5*
WB2JCE	12,240
WA2WHE	11,985*
WB2PYI	1,988
K2PMR	3,636
K2JBX	960
W3CUL	18,090*
K3PKI	30,525*
W3SLS	22,687.5*
WA4HOM	37,980*
WA4PDS	35,700*
W4NGE	33,675.5*
K4VDO	22,984
K4LMB	21,556
WA4VKG	19,929
WA4PAE	11,468
WA4EPM	9,212.5*
WA4FJF	5,875*
W9GHO/4	4,462.5*
K5FXX	29,497.5*
WA6OET	45,000*
WB6CGA	23,677.5*
WB6MOG	4,725*
W6QMO	2,325*
K7HSB	23,890*
K7ADI	3,100*
K8ONV	32,300
K8VFR	21,018.75*
W8WUT	7,312.5*
WA8ENW	3,895
WA8FSX	2,556
W9KSE	38,640*
WA9CCP	14,676.25*
W9MLE	12,758.75*
WA9EZP	9,464
KØZSQ	25,756.25*
KØGIC	14,750*
WAØEXX	9,130
VE3EZI	41,625*
VE3BII	21,405*
VE3BBO	2,275*
VE5DZ	490*
VE6ABV	23,512.5*
DJ9SB	7,672
G3ORU	155*
KG4CM	20
OH5RZ	128
OH2YL	45
PY2SO	2,244
SP6AZY	2,250*
SP6AYQ	1,980
VK3KS	3,838.75*
VP9FV	180*
UW3XZ	2,328.75*

OM Phone

W1BAB	1,110*
W1HOZ	468
W1NEP	276.25*
W1BUS	168
W1PLJ	40
K1WJD	10
K1YKT	1.25*
W1BFA	1
W2COB	285*
WB2CON	20
W3BVL	1,350
K3TOQ	1,092.5*
K4JIG	1,522.5*
K4JSZ	792
W4LK	450
WA4UFW	387.5*
WA4MNH	262.5*
W4JUJ	37.5*
W5NQR	2,240*
K2EIU/5	2,200*
W5CSY	1,207.5*
WA5KLX	562.5*
K8YCM/5	560*
WA5JTP	468
WA5LOB	45*
WA6TKQ	1,080*
W6PGM	400
WB6IUH	221
W7ULC	840
W7NPV	112.5*
W7VIU	37.5*
W8WUO	1,612
W8BMX	704
W8MXO	420*
K8WWW	414
W8YGR	280*
W8NAM	99
K8GWK	87.5*
W9WGO	2,581.25*
W9LNQ	1,006.25*
K9VIE	852.5*
WA9BWY	813.75*
W9NLF	531.25*
K9IDQ	280
WA9CIO	67.5*
WA9KRK	1.25*
KØSLD	3,782.5*
KØETA	412.5*
WØAIH	336
WØRJF	330
KØEQY	315*
KØIFL	178.75*
WAØGZA	110*
VE6UP	110*
VE7AKB	1,350*
ZL1AGO	3.75*
4U1ITU	49

OM CW

W1HOZ	2,280
W1BHV	2,072
W1UOT	1,600
K1PHR	1,560
W1OPZ	1,462.5*
K1VII	1,435*
W1AQE	1,250*
W1NEP	1,248.75*
W1ZNM	1,230*
K1YRR/1	1,170*
W1DYE	1,014
W1FTM	700*
W1BVP	206.25*
W1IFM	137.5*
K1WJD	123.75*
W1PLJ	20
W2AAU	2,379
W2ZV	2,080*
W2BWW	2,021.25*
WB2FRE	1,812.5*
K2DDK	1,100*
W2WL	950
K2UUT	945*
W2BVN	884
K2IQH	866.25*
WB2PTS	725*
W2NCG	531.25*
WB2ICH	375*
WB2FWZ	350*
W2UAP	276.25*
WB2FVO	210*
K2BUE	108
WB2CON	67.5*
WB2AEO	52.5*
WØGKY/3	3,168.75*
K3WWP	2,092.5*
K3LXN	1,716
W3ADE	1,218
W3RYV	977.5*
K3RDM	945*
W3MSR	884
W3QOT	775*
W3UIU	105*
K4TKM	2,745*
W4HTV	2,581.25*
K4FF	2,109
W4MXU	2,065
K4MXF	2,062.5*
W4JUJ	1,728
W4WRG	1,687.5*
W4HOS	1,148
W4ZOK	988
WØGXQ/4	930*
K4NMN	882.5*
K2EPP/4	850*
K4EPI	747.5*
K4UYY	688.75*
WA4BAW	625*
K4OTT	151.25*
W5WZQ	4,772.5*
K2EIU/5	4,700*
K8YCM/5	2,802.5*
WA5KLX	2,507.5*
K5OCX	2,400*
W5LZJ	2,145*
W8BZY/5	1,760*
WA5IIS	1,450
W5GFT	690
K5JVF	638
W5NSE	593.75*
WA5BQI/5	472.5*
WA5LWZ	125*
K6CJF	2,537.5*
WA6TKQ	1,743.75*
K6YFZ	1,268.75*
W6CLM	625*
W6CLZ	396
W6RQZ	56
W7ULC	1,961
W7AYY	1,333
W7POU	930*
W7KOI	630
K7VHM	360*
WA7BXS	123.75*
WB6FHH/7	80*
W8IBX	4,290*
K8GWK	3,997.5*
W8RSW	2,700*
W8NAN	2,394
W8DWP	1,218.75*
K8KPM	1,330*
WA8MAM	1,031.25*
W8PYX	884
WA8HVR	393.75*
W8YGR	360
K8LGB	151.25*
W9LNQ	3,750*
WA9KGX	2,210*
K9WDY	2,120*
W9UTQ	1,815*
W9SFM	1,522.5*
WA9BWY	1,341.25*
WA9LHH	1,305
K9QKY	1,248.75*
W9YDQ	1,248.75*
W9CXY	1,092
WA9MFZ	1,073
WA9FIH	920*
K9HRC	825
W9TCU	630*
K9VIE	593.75*
W9QQQ	468.75*
W9WR	165
WA9CYG	31.25*
KØSLD	5,231.25*
KØOAL	2,167.5*
WØRJF	2,166
WØQWS	1,540*
WAØKDI	1,504
WAØAVA	1,500*
WAØHYI	1,140*
WAØHMW	930*
WAØCTX	220*
WØJTC	100
VE1AE	375*
VE1DB	337.5*
VO1AW	225*
VE2AQO	2,720*
VE2AZQ	962.5*
VE2IL	625*
VE3DXD	2,268.75*
VE3ELL	1,329*
VE3DDU	1,312.5*
VE4ZX	1,200
VE6UP	1,148
VE7BJD	660
VE7BLO	195*
VE8NO	37.5*
VE8BB	11.25*
KH6BIH	70*
DL7BK	472.5*
G3NFV	112.5*
G3WP	61.25*
HP1AC	11.25*
IT1AGA	356.25*
JA2JW	36
JA1XI	5*
LA9OI	7.5*
PY2CQ	25
SM5BOE	25
SP6FZ	169
SP8MJ	144
XE2AAG	297.5*
TF3AB	15*

VHF Section

K1ICW	127.5*
K1MGP	90*
K1TOP	86.25*
K8CEN	48.75*
K9ZWV	62.5*

* Low Power Multiplier.

VHF Note: YLRL added a VHF section this year because of protests when their former VHF contest was discontinued. Since only 5 logs were submitted, all YLs, WØHJL sees no justification for YLRL's continuing this section. If you still want this section, Kayla will welcome your views, but feels a minimum number of logs must be submitted before the expense of a prize can be considered.

of the exciting c.w. weekend, and still managed to shine through with top notch scores.

Mae Burke, W3CUL, won 1st place c.w. honors for the second straight year and with a slight rearrangement of her many traffic skeds, still managed some traffic handling on the side. Mae noticed a decided increase in interest among DX stations in the contest this year and watched for band openings. C.w. break-in played an important role and, also, she found that different antennas are of real value. Having both vertical and horizontal antennas for all bands, Mae found that at slow points a mere change of antenna was all the change needed to open up the same band all over again.

Dave Blaschke, W5WZQ, is a many time high scorer in the contest having placed among the top three winners now since 1962. "The YL/-OM," he wrote, "is one I won't miss." He points out, that for OMs it is unique in that it's relatively free of pressure. The challenge is found in good judgment and the persistent patient seeking out of new contacts. An interesting note — Dave qso'd more 4 land YLs than any other area, with YLs from 2 land second in line in number.

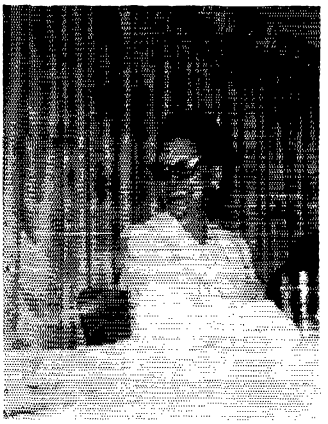
"Where are all the YLs?" Another year, give it a try and let's outnumber the OMs. Once you have given it a whirl, you'll find this a hard contest to stay away from.

35th Anniversary Greetings

Congratulations go to ARRL's Lillian Salter, W1ZJE, who celebrated her anniversary on May 12, 1965 as Administrative Aide of the Communications Dept. where she has very ably assisted W1BDI for the past thirty-five years.

YL Club and Net News

The Loaded Clothes Line Net announces their 1965 officers as follows: President, KØEVG; V. Pres., WAØLSF; Secy., W7GGV; Treas., KØWZN; Publicity, K7WVT. Their certificate requirements have also been changed to allow credit for 5 off net c.w. contacts and 10 off net c.w. contacts, also, for 15 phone contacts. Send all information to K5ECP, Certificate Custodian.



YLs attending the N. E. Div. Conv. at Swampscott, Mass. in April enjoyed a talk at the Wrone meeting on "YL and the Moonbounce" given by Helen Harris, W1HOY. Helen is an enthusiastic Charter member of Wrone, a Past President and present Editor of Miss Wrone's Chatter, and is also a Contributing Editor of *QST*.

YLRL announces a new YLCC Certificate Custodian. After August 1, 1965, all information should be sent to Onie Woodward, W1ZEN, 14 Emmett St., Marlboro, Mass. Katherine Johnson, W4SGD, is to be congratulated for her fine work in this position for the past ten years.

The Floridoras announce their new officers for 1965 as follows: Pres., Evalyn Shea, K4UIZ; Vice Pres., Dorothea Seaver, W4QBY; Secy., Georgia Denman, K4ZXS; Treas., Cathy White, K4TBG; Permanent pin custodian, W4WBD; Cert. Custodian, K4RNS.

The Portland Roses recently voted the following change in their certificate requirements: DX stations need contact only 5 members and U. S. operators contact 8. Full and associate members count equally. Logs should be sent to Helen Wise, W7RVM, 4311 S. E. Salmon St., Portland 15, Oregon. QST

Strays

A group of adventurous individuals will be making a canoe expedition down the Mackenzie River in Central Canada this summer and will have amateur radio equipment set up in the canoes for mobile operation, as well as land-based operation. The farthest point north will be the Arctic Sea, and studies on propagation will be made along the route. The schedule of operating frequencies is as follows:

C.W.	Phone
3.580 Mc.	3.780 Mc.
7.080 Mc.	7.100 Mc.
14.080 Mc.	14.180 Mc.
21.080 Mc.	21.220 and 21.320 Mc.
29.400 Mc.	29.500 Mc.

The above frequencies are shown without times because the band used will depend on conditions at the time. However, all designated frequencies will be monitored at the beginning of each hour whenever possible. Since some of the phone frequencies are not available to American hams, the following frequencies have also been set up for monitoring at the beginning of each hour.

3.890 to 3.900 Mc.
7.320 to 7.330 Mc.
14.260 to 14.270 Mc.
21.310 to 21.320 Mc.
28.500 to 28.510 Mc.

Special QSL cards will be sent to stations contacting the expedition.

— • • • —

The May "Miser's Dream" cover set Fred Burdge, K3WNL of Williamsport, Pa., to wondering how many hams are retired magicians, or perhaps amateur magicians. Fred was with John Calvert and later had his own act.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
LILLIAN M. SALTER, W1ZJE, Administrative Aide — GEORGE HART, W1NJM, National Emergency Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards — ELLEN WHITE, W1YYM, Ass't. Communications Mgr.
GERALD PINARD, Club Training Aids — PETER CHAMALIAN, W1BGD, Communications Asst.

Getting Into Net Operating . . . "The NCS Is One Who Stands Tall" . . . "There comes into each man's life a need for a challenge and after 10 years of yakking behind a mike, mine became the extra class examination, but I made it, the second time around, so I have the Extra. But still something was lacking . . . recently I've taken a new look at the traffickers work and I've never been so thrilled in my life. Here, Mr. Handy, is Amateur Radio at its finest, the true pinnacle to which one can aim. It was what I wanted. A challenge hard for me to describe.

"First one must want to be part of the team . . . but these fellows are pros and I felt like the high school pitcher wanting to play with the N.Y. Yankees, who would dare to check into the MDD group. But I find that MDD has a rookie team, the 'slow net'. I look up its freeway and check in with W3ZNW.

"After passing some messages back and forth and thinking I'm a pro the time comes to check into MDD itself. I can't do it. I sweat, my hand shakes, I come apart at the seams. I give up. I'm beat. I come upon myself as I really must be. I'm a coward. I find it hard to face it.

". . . Finally I make up my mind I'm not beat. The guys have something I don't yet have. I set new goals, 25 w.p.m. by ear. Here is where WCC comes in . . . press releases from about 11:15 P.M. local at 25. Finally I drove myself to check into MDD, realizing I had a way to go. Anyhow, I did it. The ice was broken. And what a welcome. W3QCW has taken me under his wing (I like to think). A real rookie, but at least I'm in the ballpark. I forget Q signals and make errors . . . I don't know how I got through the ordeal. It took a repeat at 10 w.p.m. but I QSLed it and felt like a lid.

"Since then I check in from time to time, do lots of listening and admiring. I am at the foothills of a high mountain and someday shall arrive at the peak. It will take time but what a worthwhile goal. . . . An NCS in this field is one who 'stands tall.' There are those who would say to rid the pages of *QST* of nonsense like traffic reports and related writings but these are the uniformed. We should encourage more to take advantage of the challenge that traffic handling has to offer. Speaking of a 'pool of trained operators' I think this is what FCC had in mind." — S. Lee Maulsby, W3RKK.

Virginia Sets Pace. Puts ARPSC Availabilities on Record with Red Cross. SECs, Section Emergency Coordinators, and ECs have important functions (enumerated page 8 of *Operating an Amateur Radio Station*). One important SEC responsibility is to make contact with *all agencies served in the public interest*. The SEC also works with other communications groups, especially neighboring SECs in making and testing alerting-operating plans. As of possible interest to other SECs in their planning and promotion we want to tell you of a method followed through in Virginia. The idea is to find a way to go on record with each agency that may use amateur service to assist it in advance of disaster, *in locating and consulting with the amateur service representative*. SEC Hopkins, W4SHJ procured a supply of the ARRL-ARC Cooperative Understanding pamphlets (CD-167) and a list of the Red Cross Chapters in Virginia. To combat any lack of liaison between the Chapter and amateurs the CD-167 pamphlet with the following *stencil on its face* was mailed direct to each Chapter, attention: Disaster Chairman. The added statement:

> The below listed member (s) of ARRL's Amateur Radio Public Service Corps is (are) prepared to render disaster communications service and planning assistance to your chapter. He (they) will be honored to serve as advisor (s) or preparedness committee members.

Under this statement each EC or his assistant having jurisdiction had his address shown on the booklets. Where there was no EC near a given Virginia chapter, the listing was given for an active OPS or ORS, as appropriate. May we add that the Red Cross heartily approves of the action taken. Mr. R. H. Myers, K4IAG, Radio Communications, Office of Communications and Reporting, American National Red Cross, Washington 6, D.C. offers to send any member of the ARPSC or (SEC or EC) a list of Red Cross Chapters for his area in which such action is desired.

ARRL Official Observers Wanted

Active operators who are League members are invited to apply to SCMs, wherever qualified by experience and interest. The League provides special forms for mail notices so that OOs rarely (except by request) describe signal difficulties or call attention to them *over the air*. SCMs require four years license experience as prerequisite to OO posts. Also Observers can be appointed *only* in League operating territory which is to say in the U. S. or Canada. A candidate must hold FCC's General Class License or above; in Canada, DOTs equivalent or higher. Interested readers can ask the SCM for the OD-45 application form. It contains questions from which com-

petence and equipment may be judged by SCMs. New Observer appointees receive Standing Information for OOs (CD-100) as a guide to system notification policy, also of course, their initial supply of the forms to be used. There are quarterly bulletins and letters to Observers regarding FMTs (frequency measuring tests) and current Observer problems.

— *F. E. H.*

APRIL CD PARTIES

High-Claimed Scores

The following are high-claimed scores, QSOs and sections. Final results will appear in the July *CD Bulletin*.

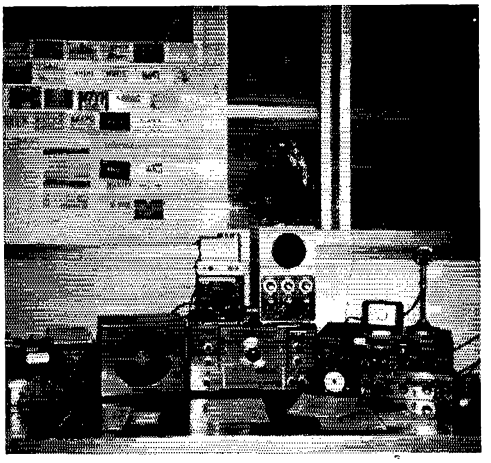
C.W.

K1WJD.....222,870-63 -69
WB2AIF.....214,270-613-66
W1ICP[1].....179,190-536-66
WA2WLN.....167,580-525-63
K1ZHS.....163,800-497-65
W1BGD.....163,680-489-66
W9YYG.....161,600-500-64
W1SWX.....158,275-480-65
K8NJW/8.....155,675-474-65
W4DVT.....155,100-463-66
W6YRA[2].....152,500-442-68
K4VFY.....149,400-492-60
K7CHH.....146,520-438-66
K1YKT.....144,770-461-62
W4YGY.....141,375-435-65
K3QDD.....140,800-434-64
W8SH[3].....138,570-440-62
W1ECH.....138,380-400-68
W9LNQ.....132,600-403-65
K5OCX.....129,200-425-60
K4ZRA/4.....128,100-421-60
W2GKZ.....128,000-393-64
W1FJJ.....127,890-400-63
W4WHK.....123,900-408-60
W4TFL/4.....122,100-407-60
K4RIN.....118,420-378-62
K9WIE.....117,990-410-57
W4MXU.....116,000-393-58
K1ZND.....113,460-359-62
K4VDL[4].....112,770-358-63
W1JYH.....112,220-355-62
K3TJE.....112,220-362-62
W3MSR.....111,935-360-61
K3KMO.....108,500-343-62
W9MAK.....106,470-331-63
W1DYE.....106,400-375-56
K9AJC[5].....105,610-352-59
K9DKU.....103,510-334-62
K3GUR.....103,200-338-68
K3HNP.....102,660-349-50
WA4JYB.....102,330-372-54
W4KFC.....101,500-343-58
WA8CEJ.....100,630-347-58
K1EWL.....100,300-333-59
WA4IUM.....100,210-353-56
K8TIC (K2SIL, W8s CQN FAW).....201,280-585-68
W1MX (4 oprs.).....130,500-450-58
WØYC (KØs OTH UXQ) 122,610-402-61
W4YAU (WA4FZT, W1YAU) 107,520-378-56

PHONE

K2QDT.....24,120-134-36
W1ICP[1].....12,320- 81-28
WB2IGR.....8160- 68-24
WA2SRQ.....7935- 65-23
W4LK.....7705- 67-23
W9NPC.....7475- 59-23
K5MDX.....6630- 51-26
W3KJJ.....6300- 51-21
W3HC.....6090- 53-21
W1FJJ.....5880- 50-21
K1ZHS.....5700- 50-20
W2DMJ.....5390- 42-22
K4TTN.....5355- 51-21
VE3EUM.....5290- 43-23
W1BGD.....5250- 43-21
W2SZ[6].....5225- 48-19
W4MXU.....5200- 45-20
W3LOD.....5145- 45-21
W2GKZ.....5130- 50-18

[1] W1YNP, opr. [2] K9ELT, opr. [3] K8NHC, opr. [4] K2FT, opr. [5] K3QOO, opr. [6] WAGPJL, opr.



BRASS POUNDERS LEAGUE

Winners of BPL Certificate for April Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	367	1796	1403	371	3937
K6BP1	81	1622	1544	78	3325
WA9BCJ	651	492	89	403	1635
K2KQC	13	797	771	20	1601
W9LGG	26	758	670	19	1503
K9ONK	122	697	638	12	1469
W1PEX	105	689	601	68	1463
K9NBH	1382	19	4	16	1421
W9MM	2	635	497	137	1271
W3EML	34	625	491	24	1174
K9KZB	14	529	501	28	1072
WA9CCP	46	536	450	10	1042
W7BA	18	498	445	50	1011
K9IVG	14	501	460	12	987
K6EPT	98	451	277	154	980
K7JHA	35	477	446	1	959
W6R8Y	31	472	296	148	947
W6ZJB	46	439	426	13	924
W6GYH	290	313	299	7	909
K5TEY	6	530	360	10	906
WB6JUH	26	416	370	45	857
K8NPT/4	10	414	412	2	838
W6VNQ	18	366	431	6	821
WA2RUE	35	407	336	25	803
W7DZX	7	409	362	1	779
WA4LCH	30	365	313	51	759
WA2GPT	16	341	286	42	715
WA4RQR/9	17	326	325	6	674
W9YHZ	-	337	332	5	674
K6MCA	18	327	306	17	668
W3IVS	26	303	257	44	630
W3VR	68	288	261	12	629
WA4GQM	91	278	236	24	629
WB6BBO	33	300	268	24	625
W3NEM	19	300	274	27	620
KØGSY	29	300	274	1	604
WA9FSW	24	281	276	5	586
WA1CRK	24	276	229	56	585
K3DCB	17	269	246	19	581
K8KMQ	78	219	192	61	580
W1DFU	27	283	262	5	577
W9AOW	29	274	183	82	568
W6WPF	96	255	213	22	566
KØOYT	11	299	291	8	559
WA4AGH	84	238	228	2	552
WB6FHH/7	11	269	212	49	541
WA5INZ	120	225	172	22	539
W1BGD	10	231	202	89	532
W1TXL	101	231	182	24	538
K8VBO	9	260	252	8	529
K2TXP	24	253	182	65	524
W9QLW	13	264	219	12	508
W5GHP	89	207	146	61	503
Late Reports:					
W6WPF (March)	33	331	264	67	695

More-Than-One-Operator Stations

W6IAB	887	1390	915	490	3682
W9YT	1266	117	69	76	1528
W4RCC	275	275	175	100	825
WØEAO	599	4	0	0	603
W9GOC	16	278	265	19	578
K9YFG	20	250	200	50	520

BPL for 100 or more *originations-plus-deliveries*

W7NPK 424	W7CTP 137	WØOMM 111
W4RZL 330	W7BTB 134	WB6AKZ 110
K5DLP 304	WA4IMC 132	WA8CTE 109
K3ZYP 209	WA4IWO 132	W9BUQ 109
WA4BMC 203	WA9EBT 120	W8DAE 108
WA9CNV 194	WA6DFT 119	K8TFE 108
K4ZRA/4 176	WB6JFO 119	WA9LWJ 107
WA9GJU 163	W6JNK 118	K9ZLB 105
W7APS 155	K4TXJ/4 117	W4OGG 104
K9IMR 152	VE2RRD 113	K9WNP 104
WA8PTC 150	WA8IMY 112	W9NZZ 103
W4NTR 149	WA9BWT 111	K1VPJ 102
WB2HWB 140		K1JIG 102

More-Than-One-Operator

KR6GF 375	KR6MB 259	KR6MH 170
	KR6MD 196	

The BPL is open to all amateurs in the United States Canada, and U.S. Possessions who report to their SCM a message total of 500 or a sum of origination and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

Top west-coast c.w. score in the April Party was by the UCLA club station W6YRA, operated by the ubiquitous K9ELT. Phil says the shack is located in the penthouse atop an 8-story engineerng structure with a beautiful view of the Santa Monica mountains. Equipment includes a 20-A, 600-L and HRO-50. The antenna setup: a tri-bander, 40-meter vertical and 80-meter doublet. Phil will be back in Wisconsin during the summer then back to UCLA in September to clinch his Master's. Look for him from 9YT or 9EWC or even K9ELT in the July Parties!

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040, 14,090, 21,090 kc.

WIDE-BAND F.M. 52.525 146.94 Mc.

W1AW SCHEDULES

Operating-Visiting Hours

Monday through Friday: 7 P.M.–1 A.M. EDST.
Saturday: 7 P.M.–2:30 A.M. EDST.
Sunday: 3 P.M.–10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors The station address is 225 Main St., Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent on request. The station will be closed July 5, in observance of Independence Day.

Operating Frequencies

C.W.: 1805 3555 7080 14,100 50.7 145 6
Voice: 1820 3945 7255 14,280 50.7 145.6

Frequencies may vary slightly from round figures given, they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in GMT:
C.W.: Mon. through Sat., 0000; Tues. through Sun. 0400.
Voice: Mon. through Sat. 0100; Tues. through Sun. 0330.
Caution: Note that in the U.S. and Canada bulletin hours usually fall on the evening of the previous day by local time.

A.R.R.L. ACTIVITIES CALENDAR

Dates shown are in GMT

July 2: CP Qualifying Run — W6OWP
July 10–12; CD Party (c.w.)
July 14: CP Qualifying Run — W1AW
July 17–19: CD Party (phone).
Aug. 5: CP Qualifying Run — W6OWP
Aug. 19: CP Qualifying Run — W1AW
Sept. 3: CP Qualifying Run — W6OWP
Sept. 9: Frequency Measuring Test
Sept. 11–12: V.H.F. QSO Party
Sept. 17: CP Qualifying Run — W1AW
Oct. 9–10: Simulated Emergency Test
Nov. 13–15: Sweepstakes Contest (phone)
Nov. 20–22: Sweepstakes Contest (c.w.)

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

July 3–5: Venezuela Independence Contest, RCV (p. 107, last month).

July 16–18: Independence of Colombia Contest, LCRA (p. 95, this issue).

Aug. 21–23: New Jersey QSO Party (next issue).

July 24–26: West Virginia QSO Party, Kanawka RC (p. 136, this issue).

OPERATOR OF THE MONTH

Have you thought back over the past month and picked out your nomination for "operator of the month?" Considerations to bear in mind include a clean signal, good keying, careful enunciation, correct procedure, judgment and courtesy. The League's Operating Aid No. 11 lists further examples. Send your vote for "Operator of the Month" to the ARRL Communications Department, 225 Main St., Newington, Conn. 06111.

During May the following additional amateurs were nominated in recognition of their extra skills and courtesies:

W1BGD	W8VWY
WB2CMR	K9CSN
W3GJR	W9MKL
WN4SWZ	K9MXL
W5GHP	K9SCT
W6ZJW	W0SEG
W8DAE	W1TRB/KG6
W8FQV	KH6EVT
WA8KKE	VK2EO
W8MPD	VK3CX
WN8QGK	VK4YP
K8RTF	VO2NA

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made July 14 at 0130 GMT. Identical tests will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted July 2 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION!* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT July 14 becomes 2130 EDST July 13.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code practice is sent daily by W1AW at 0130 and 2330 GMT, simultaneously on all listed c.w. frequencies. At 0130 GMT Tuesday, Thursday and Saturday, speeds are 15 20 25 30 and 35 w.p.m.; on Monday, Wednesday, Friday and Sunday, speeds are 5 7½ 10 13 20 and 25 w.p.m. For practice purposes, the order of words in each line may be reversed during the 5 through 13 w.p.m. tests. At 2330 GMT daily, speeds are 10 13 and 15 w.p.m. The 0130 — 0220 GMT runs are omitted four times each year, on designated nights when Frequency Measuring Tests are made in this period. To permit improving your list by sending *in step with* W1AW and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0130–0220 GMT practice on those dates:

Date	Subject of Practice Text May *QST*,
July 6:	*Some Thoughts on Home Receiver Design*, p. 11
July 9:	*Transmitting Radioteletype*, p. 16
July 15:	*W8NRB in the Soviet Union*, p. 28
July 20:	*The KH6EGL Frequency Standard*, p. 33
July 21:	*What ARRL Means to Me*, p. 50
Date	Subject of Practice Text from *Understanding Amateur Radio*, First Edition
July 26:	*Coupling and Q*, p. 30
July 28:	*Selectivity of Coupled Circuits*, p. 30

W1AW NOTE

W1AW now transmits bulletins and code practice on 160, 80, 40, 20, 6 and 2, as detailed above. Additional equipment for the station has been under long-term construction and is to be installed as fast as it becomes available. Note elsewhere on this page the frequencies and times for bulletins and for the two daily sessions of tape-sent code practice so as to make full use of these services.

C. D. ARTICLE CONTEST

A new Communications Department article contest, a continuation of the very successful *QST* Article Contest during the 1964 anniversary year, needs your best ideas (in 800–1200 words) relating to League organization, clubs, training exercises, and operating techniques. Periodically, the best articles submitted for the "CD Contest" will be chosen to appear, with the winner electing to receive (a) a bound 1965 *Handbook* or (b) a *QST* binder, League emblem and the ARRL DX map. Our third winner is the Colorado SEC, Charles M. Cotterell, WØSIN, and his article appears below.

AMATEUR RADIO — HOW IMPORTANT?

By Charles M. Cotterell, WØSIN

AMATEUR Radio licensees are a large group, however it is made up of individual and distinct people which may have small groups of them representing a certain view or taking a certain action. Each of us then, by our action or our inaction, by our comments or lack of comment, by our courteous or discourteous use of the frequencies, by our friendly or unfriendly approach to possible interference problems, by our polite willingness to help out the public generally and by our individual reaction to our problems, will nudge amateur radio in the direction that it will take in the future. Some nudges will actually be hard pushes and others will be of slight significance. Even inaction will be a nudge as we go along our way.

All of us want to keep the frequencies we have and would like to see an expansion if possible. Who knows, perhaps technically-minded amateurs will show the way. In order to keep the valuable kilocycles we now have in use, a united front must be presented at all conferences in the future. Experts in the field have been sounding the tocsin and putting out the straight dope. Are we listening? Are we helping? Do you agree with them? If not, do you have alternate proposals of a positive nature? If you couldn't care less, you will not be heard. Of course that isn't true of all those not heard from. There are many who do not have any further ideas but are in general agreement with the current course of events. Give at least your vocal support, it would be welcome.

Like to build? Experiment? Why not help out a club or a Red Cross station project? Nearly every community needs help here.

Like to DX? DX nets exist not only to help themselves but as a service. Get in and get your feet wet. Chasing DX is tough? No tougher than getting traffic through on a section net at times. Emergencies do not wait for conditions. They just happen and most often conditions are far from good. Prior planning, good operating skills acquired through practice, knowledge of the band and patience are required. Try it sometime, these guys and gals are tops.

Interested in mobiling? Mobiles are the very backbone of local public service. Where else can be found an operating station to move quickly into a stricken area and operate efficiently? Mobiles are important to public service. Your EC can schedule communications for various agencies and feel much more confident of providing adequate facilities *if* he can rely on you. Many opportunities present themselves for hamming if enough mobiles are ready to turn out when called. Red Cross, Civil Defense drills, charity drives, parades, goblin patrols, races of many kinds and the list goes on and on. These are important, too.

In message handling for third parties, getting the message through correctly and efficiently requires skill. This is the result of practice on those messages which may not be very important. The important thing is the practice. The amateurs who do this are the main-stay of the ARRL National Traffic System. I hear them asking for help. Want to join up here? Seems to be plenty of room. Give it a try. Openings exist all around for anyone who would like to help in public service. Volunteer, and if you are not immediately grabbed up, holler, someone will come running. You are needed.

Perhaps one of us has an excuse. Oh yes, we don't like the EC or the net manager, or the route manager or maybe the PAM. Surely it couldn't be all of them but if one or all, why not volunteer for his appointment? That should get a raise. Besides he needs a rest and may well be glad to have someone of your caliber take over. If you feel this has any importance at least offer a helping hand and encourage your friends to do likewise. This could be catching and would help amateur radio much more than the complaining that seems to be going on at times. Better watch out, you may find yourself an appointee anyway. Good people are hard to pass by. This is important to amateur radio, is it important to you? Actually isn't it true that there are many who wouldn't accept any appointment on a silver platter?

Then again maybe it's the SEC you don't like. He's doing some thing. Putting on airs, talking up AREC and public service and is a nuisance to those of us who had our consciences pretty well under control until he shows up. So, if he's so smart, let him do it. He has a few friends, to start with anyway, and there are amateurs who believe they have an obligation to fulfil, let them take care of the AREC/ARPSC. Do you know any one of us could be the outlet or originator of very important messages one of these days. Could be important even to us. Yes, I know the ARPSC dolls and guys will do their best for anyone and they are gluttons for punishment. Why not give a hand? It is important.

You know that the SCM could replace the SEC if he could find an eager-beaver qualified volunteer. Best way is to work up to it though so that all amateurs concerned know that you qualify.

Now there's the SCM. Maybe it's this official we don't like. Perhaps we don't like his policies or his appointments. This problem is even easier to solve. Run for his office. Back another candidate if *you* wont run. Better let the membership in on what you intend to do when elected though. Might be good to at least look like you have amateur radio at heart. Voters are generally pretty choosy. Maybe this isn't important enough to bother with. Famous last words.

So how important is amateur radio to you? Does it rate high enough on your individual scale to put in more time on its needs? Are you concerned about it's preservation? If so, some of these above officials will be hearing from you, won't they? QST

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date and time of receipt. All totals shown represent submissions received through April 30, 1965.

W1FH....313/339	W4QCW...312/329	W2DEC....310/326	W5UX....308/323	W2NUT....306/322
W4DQH...313/337	W1BIH...312/326	W1ME....310/333	W6GYV....308/326	WØQGI....306/322
CX2CO...313/334	W2ZX....312/331	OE1ER....310/332	W2TP....308/317	DL1IN....306/322
W2AGW...313/337	W8K1A....312/336	K2DCA....310/327	WØSYK....308/326	PAØFX....306/326
W3GHD...313/333	G3FKM....312/329	W5ABY....310/327	W3RNQ....308/326	WA2IZS....306/323
W1GKK...313/338	WØDU....312/334	WØBFB....310/328	W2FZY....308/321	W9GIL....306/323
4X4DK...313/331	W3GAU....312/335	W7GBW....310/334	W4PLL....308/323	W1HX....306/326
W8PQQ...313/330	G4CP....311/335	WØELA....310/333	DL2BW....308/325	ON4DM....306/325
G2PL....313/336	G3AAM....311/335	W6GPB....310/331	K6EVR....308/325	VK3KB....306/329
W9RBI...313/338	W8DMD...311/333	5Z4AQ....310/328	I1AMU....308/327	W1MV....305/322
W2TQC...313/332	W3LMA...311/333	W6EBG....310/335	W3ITG....307/330	W4QM....305/327
W8BRA...313/336	W6AM....311/336	VE7ZM....310/334	W2FXN....307/321	W6WWQ...305/322
W8UAS...313/334	W2SUC....311/328	K2BZT....309/326	K6ENX....307/324	DL3RK....305/322
W8JIN...313/338	W2BOK....311/328	G8KS....309/327	W8IRN....307/325	W2YTH....305/323
W6CUQ...313/338	K3UPG....311/335	W4TM....309/331	W4GXB....307/328	W3NKM....305/322
W7GUV...313/336	DJ1BZ....311/329	W2ZGB....309/325	G3FXB....307/325	K6EC....305/317
W8EWS...313/337	DL3LL....311/327	W5AFX....309/334	W3WGH....307/322	W5KBU....305/323
PY2CK...313/336	GE3AG....311/335	WØQDF....309/326	K2LWR....307/320	K2GFQ....304/325
W8HGW...313/338	W1CLX....311/334	W4LYV....309/329	K4AIM....307/321	W5ADZ....304/326
HB9J....313/337	W5MMK...311/332	W2QKM....309/327	W5OLG....307/328	G3YF....304/326
W4GD....312/333	W9LNM....311/334	W4VPD....309/326	W4MR....307/327	W2HMJ....304/324
W2LV....312/331	W8KML....311/332	W2LAX....309/326	DL6EN....307/322	K2QEA....304/320
W2JT....312/331	WØQVZ....311/332	W2WZ....309/332	W2SSC....307/323	W9KOK....304/328
W2BXA...312/336	W8JBI....311/330	W4OPM....309/324	W2HTI....307/322	K4RID....304/318
W2LPE...312/333	W4ML....311/331	K4LNM....309/323	W1ZW....306/323	W2PGJ....304/321
W8BF....312/333	W3JNN....311/335	W2UVE....309/327	W3ECR....306/323	W2SAW....304/321
W3KT....312/336	LU6DJX...311/335	W2AYJ....309/328	W8NGO....306/323	K2UVU....304/317
W9HUZ...312/332	WØAIW....311/334	W9AMU....309/326	W2GUM....306/328	W6OSU....304/316
W8MPW...312/340	W5KC....311/334	W2TVR....308/326	W8PUD....306/323	W6KEV....304/326
W1JYH...312/335	W7CKY....311/330	W8DAW....309/332	WØPGI....306/321	W5QK....304/315
W6YY....312/332	W4AIT....311/334	W1HZ....308/326	W7AC....306/330	W4ZRZ....304/310
W9NDA...312/336	W8LKH....311/331	WØNTA....308/328	W7WVE....306/323	G3AAE....304/324
W9YFV...312/336	KV4AA....310/334	W7ENW....308/332	HB9MQ....306/323	W3CGS....304/323
W7PHO...312/330				

Radiotelephone

CX2CO....313/334	W8GZ....312/335	W1FH....310/331	W2BXA....309/331	G3FKM....305/319
W3RIS....313/338	W7PHO....312/330	W2JT....310/324	W6AM....307/331	W9NDA....304/324
PY2CK...313/336	W4DQH...312/334	PY4TK....310/327	I1AMU....307/326	K4AIM....304/318
W8HGW...313/335	W2ZX....312/331	W9UJF....310/327	W4QCW...306/319	DL3LL....304/320
W9RBI....312/335	5Z4ERR...311/333	W3JNN....310/331	ON4DM....306/325	W3KT....303/322
W8BF....312/333	W6YY....311/331	WØAIW....310/331	TI2HP....305/327	G8KS....303/317
4X4DK....312/330	W8KML...310/331	W8PQQ....309/326	G2PL....305/325	

New Members

From April 1, through April 30, 1965, DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the rnateurs listed below.

JA1ADN....206	K4ZJF....111	K4KIF....106	W7QLE....103	W5KFN....101	W3QBK....100
4X4WF....145	K7VYU....110	OK3CBR...106	UA3KAS...103	W7ZCX....101	K5HWO....100
UAØEH....140	DJ2WV....110	UP2NK....105	VE6AJJ....103	K9ULF....101	WB6AKZ...100
OK2BBJ...137	OK3CAG....110	YU3ES....105	KØBUR....102	WØOMM....101	W8BTX....100
OD5AX....135	DM2AUO...109	WA4QME...104	G3NRS....102	DJ8PB....101	W9JQE....100
OH2MK....125	DJ8IF....109	DM3PBM...104	OE1KU....102	K1EWL....100	OK2KOS....100
OH2PB....121	W6ANB....108	DM3SMD...104	SM5CPD...102	K2DDK....100	UB5FL....100
UT5BP....113	DJ5HL....107	F8BC....104	UW4HW....102	W2QJT....100	XE1TQ....100

Radiotelephone

JA1ADN....159	OE1KW....116	OE13AA....106	H1YRK....103	WA2GSO....101	K5HWO....100
F8HA....148	K1ZJF....111	K4KIF....104	KØBUR....102	WA9AVV....101	WA5KBK...100
HL9KR....131	WA2CGD...107	WA6OET...104	KL7BCS....102	W4JPW....100	K6BPR....100
OE2EGL....120					

Endorsements

W6LDD....321	W3DJZ....244	W2YCW....208	K2LAF....185	VK3BG....154	SV1AA....132
W8WZ....319	K1DIR....243	W9QLD....203	K7UCH....184	SL6BH....153	K2AFY....131
PAØLOU...310	W4EEU....243	ON5ZO....202	VE2BCT...183	ZS6AMS...153	W4ELB....130
K4TWF....307	W7GUV....243	SP9ADU...200	W1EZD....182	OH3SE....152	K4YYL....130
DL9OH....303	K1HVV....240	K1RZK....200	W5LV....181	CE5AF....151	K9LIH....130
DL3BK....302	W2QDV....240	W9QQN....200	K1TUQ....180	W1EHT....150	KØHUD....130
CR6BX....301	W4RVW....240	WA2JBV....200	W4FRO....180	W6GSV....150	WA2EFN...127
W1WDD....300	VK3YL....238	WB2CKS....200	W7JWE....180	W6RGG....150	W8MSG....126
GM3OQH...300	GM3OLX....236	I1CWN....197	W6VYS....174	K8YEK....150	K1VKY....124
K6KIL....300	W9UX....234	K8AJK....200	W6DFR....173	WA6SLU....149	K9DKU....124
K6RWO....300	K6IEC....230	K8VUR....200	W2IP....172	K2HVN....148	W0CVZ....123
ON4NC....294	K9WTS....224	K6SOK....205	W2PXR....171	VE3AVV....147	UI8LB....123
WA2EIS....292	W2CZF....223	DJ9GD....204	WA5CBE...170	SP5ALG....147	K2JJK....122
W5LCI....292	OH3UO....222	W1ECH....200	W7MIX....170	WA4BJL....144	W4JD....122
W6HYG....285	W1WHQ....221	I8IFIC....200	W9SCZ....170	K4WMB....143	K1JKS....121
K2JGG....282	WB2FMK...220	G3OZU....200	WØTDR....170	OE5LX....143	K3IKM....121
W5OGS....281	W3FSF....220	W5EJV....194	DJ1QP....170	HG2WP....143	K1GHA....121
W3INH....280	W6UMI....220	KØJPL....193	W3CBY....164	K8ZIP....141	K5LIL....121
W6KUT....280	G2RO....220	K8RDE....192	K1AQI....162	G3EFS....141	W4GTS....120
JA7AD....273	W6DAX....214	W5IPH....191	W2LJX....162	CR7BN....140	W4MRT....120
I1ZL....271	F8SK....214	K1DMG....190	W8NPF....161	KR6JZ....140	WA6MAR...120
OE1FF....270	W2FXE....210	WB2HXD...190	K6IXS....160	OE1KW....140	W7PSO....120
VE7CE....265	W4SNU....210	K4ISV....190	KØEUV....160	OZ1TL....137	WØQEV....120
KØTJW....261	K6POC....210	W7WDM....190	VE6ABP....160	UW3 R....137	VE5JI....115
W6ISQ....260	KØMAS....210	VE6AAV....190	OE1HGW...159	VE3ACD...133	K2MHE....112
W6ABA....255	VE7EH....210	WA4LYQ....187			LA9TG....111
W5PIO....250					WA4FDR...110

Radiotelephone

K8RTW....306	W6YMV....269	W2JLH....215	H1CWN....205	W7WDM....171	W6DRF....141
W2RGV....300	WA2EIS....266	K4TWF....214	W2SNI....200	K2YLM....170	I1LX....139
DL9OH....298	K2JGG....260	DL3BK....214	I1TDJ....200	WA4LYQ....170	W9QQN....133
K2MGE....295	W4ZRZ....260	W2CZF....211	K6SOK....196	VE3RE....170	DJ7ZG....132
W4PAA....291	W3FWD....254	W4EEO....211	K8VUR....196	EP3RO....164	W6NAT....131
YV5AFF....290	W2WMG....246	VE6TP....211	W2FXE....190	EP2AU....162	W5EDX....125
CR6BX....281	W3YZI....243	F8SK....211	W5IPH....190	W0SFU....161	W5LGG....123
K4HYL....280	W2ODO....240	W1DGJ....210	W9DWQ....182	PAØLOU....161	K8AXG....123
WA6EYP...278	W3DJZ....240	WØMAF....210	W9IUV....181	VE6AAV....156	VE3ACD....123
W9NZM....277	KØTJW....232	KØMAS....210	W4BXG....180	VE6ABP....155	K1DMG....121
YV5AIP....275	WA2EOQ...231	GM3CIX....210	VE2BCT....180	WB2HXD....154	K2JJK....120
W1WDD....274	W4EEU....228	EA4GZ....208	WA4JOS....171	YV5AMW....152	W6ABA....117
W6HYG....274	OE1FF....227	WB2FSW...208	W6DAX....171	I1LCF....145	W6KG....112
W1AOL....271	W4HKJ....216		W6KUT....171	VE2ANK....142	K4HRL....111

Station Activities

ATLANTIC DIVISION

DELAWARE—SCM, Roy A. Belair, W3IYE—SEC: K3NYG. PAM: W3CFA, V.H.F. PAM: K3OBU. RM: W3EEB. DEPN meets Sat. on 3905 kc. at 1800 local time. DSMN Tue. on 50.4 Mc. at 2100 local time, the Dover 6 and 2 Net Wed. on 50.4 Mc. at 2000 local time, the Kent County Emer. Net Sun. on 3905 kc. at 1300 local time. Renewals: K3PZL as EC and ORS. Kent *County Radio Club's emergency communications* control center is set up in the Kent County Court House with equipment covering 80 through 6 and has liaison with c.d. and Red Cross. I regret to announce the passing of Sam Stant, ex-W3STS. Sam, as head of the Delaware State Police Radio System, was the author of the Delaware c.d. communications system. K3CNI passed the General Class exam. W3EEB traded his Advanced for an Extra Class license. K3GAD, ex-KJ6BZ, is back after 4 years in the USAF. K3GKF has completed 80-meter DXCC with 110/102. Traffic: W3EEB 331, K3YZF 140, K3YHR 30, K3URP 17, W3JJ 16, W3IYE 2, K3NYG 2.

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3ELI. RMs: W3EML, K3MVO, K3YVG. PAMs: W3SGI, W3SAO, K3LSV. Another V.H.F. PAM has been added, K3LSV in the Delaware County area. The EPA C.W. Net had a QNI of 479 with a QTC of 433. PTTN had a record QNI of 420 with a QTC of 184. Both traffic groups will sponsor an Eastern Pennsylvania Traffickers Picnic on July 25. For full details contact the chairman, W3EML. Susquehanna County EC K3PBU held an impromptu SET Apr. 12 with W3MCJ, K3YVG, WB2RSA, WA3CXZ, K3UIU, K3IHJ and WB2ITG participating. A class of 36 in Novice training graduated in Lehigh County under the tutorship of K3VWH. Six-meter station K3VAX is interested in forming a v.h.f. traffic net in the Lancaster County area. Any others interested in that area? K3ZMA received high honors in the Lehigh Valley Science Fair. W3ID activated the 2-meter gear and is installing a beam. Information received denotes that W3PDJ is Radio Officer for Montgomery County and EC K3EZJ is Radio Officer only in Lower Merion Township. Our apologies to both stations; also to W3RV, who turned up on our net as a "Silent Key." It later turned out that W3RVN was the Silent Key. K3RUA spent a few weeks in the hospital. W3CBH operated portable gear from the Pocono Mountains. The call of the Warminster ARC is WA3DFU. New club officers: Bucks County ARC—K3ODM, pres.; W3UAX, vice-pres.; W3MJR, treas.; W3ICC, secy. S.s.b.? Yep, W3KJJ says he's been converted. New Gear Dept.: WA3CKA added a Vibroplex Bug. W3ADE acquired a new 1937 NC-101X. K3ZSK erected a 10-meter ground plane. WA3AYO is a new General and WN3ARC a new Novice in the Lancaster area. Some of you will be reading this column at Field Day. Did you get that message off to us for the extra 25 points? Traffic: W3CUL 3937, W3EML 1174, W3IVS 630, W3VR 629, K3DCB 581, K3MVO 400, K3FHR 269, W3AIZ 254, K3YQJ 196, W3QDW 172, K3MYS 161, K3PIE 161, W3ZRQ 135, K3WEU 105, K3YVG 100, W3ELI 87, W3JKX 77, WA3CKX 69, WA3CKA 61, K3ZUN 60, K3KTH 58, W3VAP 51, K3RZE 47, K3HNP 43, W3MPX 42, W3CBH 35, K3HKW 33, W3OY 22, K3PWM 20, K3MHD 18, K3KKO 16, W3BEF 15, W3LXN 14, K3LPT 12, K3RUA 12, K3TVT 11, W3ADE 10, W3KJJ 8, K3MNT 8, WA3BYH 7, WA3CXZ 6, K3VAX 6, K3ZSK 4, WA3BJQ 2, K3FOB 2, W3PDJ 2, W3ID 1.

MARYLAND—DISTRICT OF COLUMBIA—SCM, Bruce Boyd, W3QA—SEC: W3CVE. RMs: K3JYZ, W3QCW, W3ZNW. PAMs: W3JZY, K3LFD.

Nets	*Kc.*	*Time*	*Days*	*Sess.*	*QTC*	*Ave.*
MDD	3643	0000Z	Daily	30	409	14.4
MEPN	3820	2200Z	M-W-F	22	91	4.1
MEPN	3820	1700Z	S-S			
MDDS	28200	0130Z	M to St.	30	49	1.1
MDDS	3650	2200Z	Sun.	4		
MSTN	50150	0100Z	Daily	30	50	1.7

K3GZK and K3UXY find that the warm weather is starting to take its toll in traffic. W3EOV and W3JZY can now repair storm-damaged antennas. 6-meter net activity still is high. K3ZSX was active in the MSTN and lost only 2½ hours in replacing his beam when it was blown down. K3IQK is encouraging E. Pa. stations to start a 6-meter net like MSTN. K3URE is NCS for the 6-Meter Nite Owls Net. PAM K3LFD has been concentrating on MSTN. K3ZYP has top traffic listing and made the BPL for the 4th consecutive time. He also wants it known that he has been OBS since last November. *Appointments*: W3EIS is OO again after a long time away. *Gear*: W3QCW added a ¼-kw. amplifier. WA3AFS is building a 15-watt rig while at RPI (W2SZ). K3IPX is building a 6-meter d.s.b. transmitter. W3ZNW had to repair the transmitter and antenna. *V.H.F.*: W3PQT now has a TDQ transmitter on 2 meters from the Patuxent station. Both K3DNO and K3YKC report 6-meter band openings on Apr. 30. K3KYC also found the band open on the 6th, 13th and 18th. *General*: Sorry to lose K3KMO, who will move to W. Pa. in July. WN3BAE has passed the General Class exam and is busy studying for the Extra First. WA3AZI would like to have a Maryland QSO Party. Let's have comments from the gang on this. W3PQ visited Chicago hams while on his vacation in April. W3HQE will be back in Spain in May. W3CDG has worked over 500 counties. *Clubs*: Thanks to K3FFX, we learn that the Wheaton Youth Center ARC has been formed, sponsored by the Montgomery County Recreation Department. There are about 40 teenage members and the club call is WA3DDX. K3ORP, of the Easton ARS, reports that W3AV donated a HQ-180 to the club before leaving for 9-Land. K3JYZ's talk on NTS reported last month at the Friendship ARC can be heard by your club also. Just give Andy your request a few weeks in advance. Traffic: (Apr.) K3ZYP 343, K3ZLE 160, K3JYZ 158, W3PQ 109, W3PQT 85, W3EOV 81, K3QDD 78, K3TJE 77, K3GZK 67, W3HQE 66, W3QCW 63, K3LFD 58, K3URZ 58, K3IQK 50, W3ZNW 47, K3IPX/3 44, W3UE 38, K3URE 33, K3UXY 32, W3LBC 31, K3LLR 29, K3KMO 21, W3MCG 20, W3RKK 19, WA3BNL 16, K3ZSX 14, W3CDG 10, K3NCM 9, WA3AFS 3. (Mar.) K3PQT 112, K3UXY 68, K3IPX/3 52, W3MCG 16, W3WTW 10, K3KMO 9, K3OSX 6.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2BLV. K2ARY, Carneys Point, is a new OBS. WB2GUK, Atlantic City, moved up to Amateur Extra Class. N.J. Phone & Traffic Net totals for Apr.: 30 sessions, QNI 551, traffic 290. W2ZI, net manager, plans a two-week trip to the West Coast, where he hopes to see many OT friends. W2BAY, Haddonfield, is doing FB on 75-meter s.s.b. mobile. The Gloucester County Board of Freeholders proclaimed May 17-22 as Amateur Radio Week in Gloucester County. The GCARC set up stations in Woodbury and Pitman. K2AQL is GCARC's Field Day chairman. WB2JRU hopes to be on 6-meter RTTY soon. SJRA's Hamfest will be held Sept. 13 at Molia Farms, Malaga; the GCARC's Hamfest July 25 (rain date Aug. 1) at Crystal Birch Lake. The SJRA plans to hold its Field Day exercises at the Burlington County c.d. site in Marlton. The Burlington County Radio Club plans to hold its Annual Picnic Aug. 14 at the home of W2RQC, Jobstown. There is an opening for ECs in Cumberland and Mercer Counties. WA2BLV, NJN Net Mgr., will welcome your help in delivering traffic which, under present conditions, is being mailed rather than via local phone delivery. Help speed up message delivery. No reports were received from clubs in Atlantic, Salem, Mercer and Cumberland Counties. All reports should reach your SCM during the first week of each month. Traffic: (Apr.) WA2KIP 159, W2RG 139, WB2GUK 98, W2ZI 39, W2BZJ 3, W2GIW 6, W2BEI 5, W2IU 3, WA2KAP 2. (Mar.) W2GIW 10.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ZRC. PAM: W2PVI. RMs: W2RUF, W2EZB, W2FEB. NYS C.W. meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 2200 GMT, NYS C.D. on 3510.5 kc. and 3993 kc. (s.s.b.) at 0900 Sun. and 3510.5 kc. at 1930 Wed., TCPN 2nd Call

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

Area on 3970 kc. at 0045 and 2345 GMT. NYSCN on 3510 kc. Sun. at 1000 and 3670 kc. at 1700 Sat. Congratulations K2KQC on making the BPL. Appointments: WB2EDU as OPS, WB2OYB as OES. Endorsements: K2SIL and K2SSX as ORSs. The Canisteo Valley ARC and 6N2 Amateur Radio Council of W.N.Y. have become ARRL affiliates. WB2NVZ reports the formation of a new club to be known as the Weedsport Central School ARC. The Chenango Valley ARA of Norwich, N.Y., held an organization meeting and elected WA2RBN, pres.; WB2FAG, vice-pres.; K2IQH, secy.-treas.; K2JVE, pub. coordinator. The club already publishes a monthly newsletter. K2EE's original license was #8897 dated Dec. 15, 1915, and the call was 8JJ. Your SCM will be glad to list any prior to this. Let's find out who has been licensed the longest. The RARA elected WA2KND, pres.; K2KFN, vice-pres.; WA2TKB, secy.; WA2RXL, treas. The executive committee includes K2SKO, WB2FGV, K2PLO, WA2ZQN, WB2HZM, WB2QVA, WA2FVG. K2AHQ reports that the Glens Falls AREC will provide communications for the White Water Derby at North Creek. K2ZWI (U. of R.) will be on next fall with a new SB-400. Gear for 220 and 432 is being constructed with TV planned for 432. Clarkson College ARC held a hamfest May 8. RAGS held one Apr. 24. The Niagara Frontier DX Club has acquired commercial 2-meter f.m. gear for alerting each other when the rare ones show up. WB2FPG got his CP-25 endorsement. He'll be going to Worcester Polytech next fall. K2QDT got a new 40-ft. tower. The NYSPTEN will hold its picnic Aug. 21 at Thatcher State Park. Traffic: K2KQC 1601. W2GVH 395. W2RUF 326, WB2GAL 290, W2OE 157, W2HYM 131, WA2TUI 122, W2FEB 97, WA2IHP 94, WB2HLV 88, K2ZWI 88, K2OFV 72, WB2IGF 66, W2LYG 64, WB2NZA 61, WB2FPG 50, K2MIP 49, K2RYH 38, K2JBX 30, W2RQF 28, W2MTA 27, K2AYQ 25, WA2FCG 25, WA2GLA 24, K2IMT 20, K2QDT 10, WB2ERK 9, K2MQN 9, K2HOH 7, K2DNN 3.

WESTERN PENNSYLVANIA—SCM, John F. Wojtkiewicz, W3GJY—Asst. SCM: Robert E. Gawryla, W3NEM. PAM: W3TOC, K3VPI (v.h.f.). RMs: W3KUN, W3MFB, K3OOU, W3UHN. Traffic nets: WPA, 3585 kc. 0000 GMT each evening. W3TVW is convalescing from injuries sustained in an automobile accident. WA2HXZ, formerly W3WAQ, is recuperating from a serious operation at 40 Manito Ave., Oakland, N.J. Spurred on by FCC proposal to upgrade licenses, W3SMV took the Amateur Extra Class examination and passed. So did W3NWB. New Generals are WA3BYD, WA3CZD, WA3APR, WA3BHV and K3UTQ. K3JCC is now DL4DN in Germany. W3NAV, Coke Center Radio Club, purchased a Johnson Ranger for its Novice members. Former K3HTG is now WB6BVB. W3TTV helps Boy Scouts with their code practice. Help support your section hamfests through the summer by attending if at all possible. The upgrading of code speeds is done by Novices WN3DEB, WN3DGL, WN3DCN and WN3DHU. K3ZGI is trying out a new 20-meter beam. K3PPZ, K3JOT and K3UTL lost their antennas in high windstorms. The Two Rivers ARC will hold a hamfest on July 11 at Locust Grove, Greenock, Pa. If you want code practice on 6, look for W3KPJ, Sat. and Sun. evenings. K3FKQ plans maritime mobile operations on Lake Erie. W3KQD worked CEØXA for a new DXCC country. W3SOG is active on 7-Mc. s.s.b. with a new transmitter. Altoona area amateurs participated in a search for a missing 8-year-old girl at Tyrone, Pa. Club bulletins received: Coke Center ARC, Etna ARC, Two Rivers ARC, Nittany ARC, The Steel City ARC, Foot Hills Radio club and The McKean County *Ham-Letter*. My thanks to the aforementioned club secretaries. The Cumberland Valley ARC provided communications for the Chambersburg Cancer Drive. The local newspaper gave the amateurs credit in a nice write-up. New appointments: W3BIH as OO/ORS; K3ZYK as EC Indiana County. Endorsements: K3IML as EC, K3IFK as EC, W3JHG as ORS. *Watch the expiration date on your license.* Traffic: W3NEM 620, W3MFB 188, K3PYS 162, W3KUN 68, W3KPJ 53, W3LOS 47, W3SMV 37, W3GJY 35, K3ZMH 26, W3UHN 22, W3IYI 18, K3NZB 15, W3KWO 14, K3SMB 14, K3SOH 14, W3LOD 8, K3TEZ 6, W3KQD 5, W3OEO 5.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: George Nesbed, W9LQF. SEC: W9RYU. RM: WA9DXA. PAMs: W9VWJ, WA9CCP and WA9KLB. Cook County EC: W9HPG.

Net	*Freq.*	*Time*	*Apr.*	*Traffic*	*Mgr.*
IEN	3940	1400Z Sunday	—	PAM	W9VWJ
ILN	3515	0100Z Daily	142	RM	WA9DXA
NCPN	3915	1300Z Mon-Sat	2100	PAMs	W9VWJ
NCPN	3915	1800Z Mon-Sat			WA9CCP
ILL PON	3925	1700Z Mon-Fri	112		K9WYX

The 9RN traffic count was 665 and the Interstate Single Sideband Net handled 1687 messages. Governor Otto Kerner has proclaimed Aug. 2 to Aug. 8 as Amateur Radio Week. To celebrate this occasion the Sangamon Valley Radio Club, Inc., of Springfield, has been granted an exhibit at the Illinois State Fair, where a complete station will be in operation. WA9LUG has a new Heathkit SB 200 linear in operation. The new officers of the Wheaton Community Radio Amateurs are W9FBD, W9BOI, W9RFS, W9NWK and W9SKX. The Worth Township Amateur Radio Club will put on a public demonstration July 2 and 3 in the Village of Evergreen Park. QSL Bureau Manager W9MSQ asks that we remind the gang to send envelopes so that he can forward the many QSLs that he has on file. Please send envelopes at least 4" x 6". K9UAR has just acquired a new Galaxy for s.s.b. The Loyola Academy High School ARC is now an ARRL affiliated club. Our sympathy to the family and friends of W9FBJ, of Rockford, who lost his life in an automobile accident Apr. 3. W1IKE was a guest at meetings held in Springfield, Peoria, Streator and at the Starved Rock Radio Club Hamfest. K9POW has a new Collins KW final. W9ODT is operating with a new Heathkit on 20 meters. WA9LOI, W9IMN, W9DGV, K9RAS, W9REC, K9DDB, WA9GCM, W9HQX, W9KEX, W9ING, W9NPC, K9WMP, W9VOX, W9TZN, W9TGN, W9PNE, K9VVL and W9WYB participated in the latest ARRL Frequency Measuring Test. Many clubs will conduct Extra Class license classes. The first notice to reach this column was the Joliet Amateur Radio Society which began a class May 4. WA9EBT, ILN Net Manager, reports that the net needs check-ins in the Western Illinois area, especially Quincy, Galesburg and the Moline areas. New calls heard are WN9OHN, WN9NMV, WA9DLZ, W9RRF and WN9MGF. New officers of the Elgin Amateur Radio Society are W9CNC, K9ERP, W9YHZ, K9VEY, W9EYF, W9LI, K9IVQ and WA9FDX. WA9HQJ won the Hallicrafters regional prize of an SR-160 and power supply. WA9EBT received the first message from Santo Domingo since the unpleasantness there, from a Peace Corps nurse to her mother in Evanston. WA9EBT received his ORS appointment this month. BPL certificate recipients this month include K9NBH, K9KZB, WA9CCP ,W9HYZ, WA9CNL, WA9EBT, K9WMP. Traffic: (Apr.) K9NBH 1421, K9KZB 1072, WA9CCP 1042, W9YHZ 674, WA9CNV 439, WA9EBT 282, K9WMP 185, WA9LUG 138, WA9GUM 135, WA9DXA 123, K9BTE 103, K9BQQ 89, K9CYZ 88, K9QYY 84, WA9AJF 53, W9EVJ 53, W9HOT 38, W9DOQ 33, W9HSK 24, W9DUA 18, W9IDY 16, W9PRN 16, WA9KKA 6, W9YYG 4, K9DQU 2, K9IFW 2, WA9KLB 2, K9RAS 1. (Mar.) WA9DXA 123, K9RNQ 91.

INDIANA—SCM, Ernest L. Nichols, W9YYX—Asst. SCM: Donald Holt, W9FWH. SEC: K9WET.

Net	*Freq.*	*Time*	*Apr. Tfc.*	*Mgr.*
IFN	3910	1330Z daily, 2300 M-F	994	K9IVG
ISN	3910	0000Z daily, 2130 M-Sat.	1199	K9CRS
QIN	3656	0000Z daily	335	WA9BWY
RFN	3656	1200Z Sun.	19	WA9IZR

K9GLL, PAM of the Hoosier V.H.F. Net, reports April traffic of 98. W9QLW, RM of 9RN, reports 100% representation by Indians in April. New appointments: WA9IZR as RM of RFN, W9UC as CL, IV OO. BPL certificate winners: WA9BCJ, W9MM, K9IVG, WA4RQR/9, K9YFG, W9QLW, W9BUQ, K9ZLB, WA9BWT and W9NZZ. QIN honor roll: K9HYV, WA9FDQ, K9VHY, WA9BWY, W9QLW, W9ZYK, WA9AVT and K9WWJ. Indiana amateurs responded magnificently to the demands for communications during the severe tornado emergencies of April. K9AJC has a new Collins S/Line, a Heath SB200 linear and a Cubex quad antenna. K9GEL worked 16 new countries and helped a Congolese missionary get a new aircraft part to fly out of the bush. Bloomington ARC officers: K9CGT, pres.; K9QDD, vice-pres.; W9YAN, secy. K9TFJ has converted a G.E. Fm. unit to 6 meters. *Amateur radio exists because of the service it renders.* Traffic: WA9BCJ 1635, W9MM 1271, K9IVG 987, WA4RQR/9 674, K9YFG 520, W9QLW 508, W9BUQ 328, W9ZYK 308, K9HYV 288, WA9FDQ 246, K9ZLB 183, WA9BWT 174, W9NZZ 161, W9YB 136, W9INL 115, K9GLL 110, W9RTH 98, K9CRS 97, WA9AVT 83, WA9IZR 75, WA9AUM 71, K9BSL 62, K9WWJ 62, K9VHY 53, W9ZSK 48, W9YYX 47, W9FZW 45, W9CC 44, WA9BGI 33, WA9BRD 29, WA9DXY 28, W9CLY 26, K9EFY 25, W9RZI 23, W9DUD 20, K9VZQ 16, WA9DTZ 15, WA9FGT 15, W9DOK 14, K9KTL 14, K9RWQ 14, W9FWH 12, W9ASZ 11, WA9LLE 11, W9DZC 10, WA9GKF 10, K9ILK 10, WA9GXF 9, W9SNQ 8, K9UEO 8, W9BDP 7, WA9CYG 6, K9AJC 4, K9TFJ 4, W9JPX 1.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC; K9ZPP. PAMs: W9NRP, K9IMR, K9HJS, WA9EZT. RM: W9IQW.

Net	Freq.	Time	Sess.	QNI	QTC	Mgr.
BEN AM	3985 kc.	1200Z Mon-Sat.	26	262	267	W9NRP
BEN N	3985 kc.	1700Z Daily	30	606	487	K9HJS
WSBN	3985 kc.	2215Z Daily	30	1315	1090	K9IMR
WIN	3535 kc.	0045Z Daily	29	299	105	W9KQB
SWRN	50.4 Mc.	0200Z Mon-Sat.	25	383	27	WA9EZT

Net certificates went to K9LDU, K9FHI, W9VAJ, K9WIC, K9TBV, K9RTG, KØPIZ, WA9LWJ, WA9FOM, K9FWN, WA9BPB and W9AYK for BEN; K9LGU and W9IBM for WIN; WA9CPN, WA9LWJ, WA9EOF and WA9HHA for WSBN. New appointment: K9PMK as OES. Renewed: K9CUT as ORS, K9GSC as OES. FMT results: W9BCY 3, W9KCR 2.0, K9GSC 7.4, W9GFL 42.3, W9DLY 580.1 p.p.m. error. The WNA Picnic will be held July 11 at Menasha. For further information contact K9AGT. W9YT originated 1250 messages in 3½ days. W9VSO led the OOs with 26 notices and W9GFL was second with 25. WA9MBK participated in the Madison Sout-O-Rama. BPL certificates for April traffic went to W9YT, W9GOC, W9AOW, WA9GJU, K9IMR and WA9LWJ. W9OTL, W9CBE, WA9AQQ and W9HHX assisted in some public service work from HC1RS in Equador. Traffic: (Apr.) W9YT 1528, W9GOC 578, W9AOW 568, WA9GJU 465, W9DYG 441, K9IMR 403, W9CXY 368, K9HJS 292, WA9LWJ 231, W9CBE 152, WA9MBK 147, K9JXW 135, K9AIF/9 107, W9NRP 104, K9WIC 88, WA9IJN 72, W9HWQ 66, K9ZPP 60, K9GSC 57, W9AYK 50, W9WJH 48, W9IRZ 43, WA9AKE 40, K9CPE 25, WA9IVH 21, K9KPS 19, W9HPC 15, K9QKU 14, K9UTQ 13, K9ERD 11, W9QQQ 9, K9DBR 8, W9OTL 7, K9WIE 7. (Mar.) K9QKU 6. (Feb.) K9QKU 8.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr. WØTCK—SEC: WAØBZG. RMs: WAØEPX, WØISJ. PAMs: KØFLT, KØVPJ. MSSB PAM: WØHEN. V.H.F. PAM: WAØCQG. MSPN meets M.-Sat. on 3820 kc. at 1800Z and 2300Z. Sun. at 1500Z; MSSB M-F on 3805 kc. at 1730Z and on 3812 kc. at 0045Z; MSN (c.w.) daily on 3595 kc. at 0030Z; MJN (slow-speed c.w.) daily on 3595 at 0100Z; Six-Meter Net M-F on 50.25 Mc. at 0430Z and at 0200Z Sat.; North Star YL Net on 3820 kc. at 1500Z each Tue. All nets meet one hour earlier by GMT during DST, same local time. Congrats to new appointees WØISJ as RM, WØHUU as EC, WAØIIJ as ORS, WAØIEF and WAØDKP as OPS. Appointments endorsed: WØFFX, WAØDGW, KØGKI, KØHKA and KØZZR as ECs; WØKJZ and WØFIT as OBSs. WØKJZ sends code practice nightly at 9 P.M. on approximately 3653 kc. WAØETL is a new General Class op. WAØIAW got into flood work during his first week as EC! OPS WAØIEF has switched to a Drake 2A receiver. EC/OPS WAØEDN received his 73 sections award. EC WAØFUR has a new 2-meter f.m. rig. OES KØOST worked Ga. and La. on 6 meters. AREC standings: 251 members with 31 ECs. Picnics coming up. OGS Picnic, Gunn Park at Grand Rapids July 11. Piconet members at Austin July 20, Mankato ARC at the Blue Earth Co. Fair grounds July 27, Duluth ARC Aug. 1, St. Cloud ARC Aug. 8, Minneapolis ARC Aug. 15. For more details check on the nets or with the sponsoring clubs. Our thanks to all who helped to provide communications in the floods. KØZRD made the BPL handling flood traffic in April. Traffic: (Apr.) KØZRD 250, WAØIIJ 240, WAØJKT 161, WAØIAW 150, WØYC 130, WØISJ 96, KØZZR 86, WØHEN 83, WAØEPX 58, WAØBYO 56, KØFLT 50, KØQBI 50, WAØEDN 48, WØTCK 46, KØPIZ 45, KØVPJ 42, WAØDOT 34, WØATO 30, WAØFUR 25, KØIGZ 25, WAØAAM 24, WAØIEF 24, WØUMX 23, WAØBZG 20, KØICG 20, WAØDVH 18, KØZKK 18, WØMXC 16, WAØCQA 15, WAØFIK 14, WAØACI 13, WAØDFT 10, WØKJZ 10, WØFKC 9, WAØFCJ 8, WAØGNO 8, KØIKU 8, WAØHMW 5, WAØJPR 4, KØLWK 4, WAØEZQ 3, WØLIG 3, KØOST 1. (Mar.) WØISJ 46, WAØIEF 25, WAØFIK 15, WAØHMW 5.

NORTH DAKOTA—SCM, Harold L. Sheets, WØDM—SEC: WAØAYL. PAM: WØCAQ. Greater Grand Forks hams who took an active part in the flood control of the Red River were WAØBIT (NC), WØMQA, WØAQF, WA8MTV/Ø, WAØHRP, KØZZK, KØOVE, WØDM with mobiles. WØGFE, WØHZM/m, WAØGNI, WAØAYL, WA4GKZ/Ø, K7LAY/Ø, K8GHE/Ø, KØHXL, KØRSA and KØVDP. Grand Forks Valley Jr. High Radio Club has four new Novices: WNØLZD, WNØLZE, WNØLZF and WNØMAQ, who keep KØPZW, the club station, on the air. WØGFE has been retuning the quad while WAØEDY has a new one. WØYRD is keeping 6 meters busy. WØCGM has been busy with Navy-MARS activities besides his RACES Net duties. The SCM would like to hear from all those interested in a slow c.w. net and a net to hook up with the NTS. Also applications are requested for ORS, OPS and OBS appointments. RACES check-ins for March 1051 messages handled 367, sessions held 23. Traffic: KØITP 118, WAØAYL 9, WØDM 4.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—Asst. SCM: Jene H. Melton, WAØDEM. SEC: WØSCT. RM: KØGSY. WØEUJ has been elected mayor of Viborg. WAØJCV is signing into nets from Lennox. KØGSY made BPL for the fourth consecutive month. New equipment: WØRRN has a new Swan 350, WØDJO, Spink County EC, conducted an AREC drill during April. KØFKJ has added a Viking 6N2 and 8-over-8 beam to his v.h.f. equipment. WØSMV reports a DX count of 272/258. Information has been received that WØDKJ/KØULI will become a lecturer in science and mathematics education at National University, Seoul, Korea, starting Sept. 1. WØCUC and WAØIQI have returned from India. Traffic: KØGSY 604, WØZWL 356, WAØAOY 176, WØSCT 148, KØVYY 58, KØBMQ 37, KØAIE 30, KICAU/Ø 28, WØHOJ 21, KØTXW 19, WØDJO 18, WAØBWJ 16, KØTNM 15, KØYGZ 13, WAØJCV 12, WAØBWF 9, WØDIY 8, WAØCKH 6, WØFJZ 4, KØJGM 3, WØZAL 2.

DELTA DIVISION

ARKANSAS—SCM, Curtis R. Williams, W5DTR—SEC: W5NPM. RM: K5TYW. PAM: WA5GPO. NMs: K5IPS, W5NCT, WA5IEQ. WA5KUD is now an ORS. Our thanks to WA5GPO for taking the PAM appointment another year. W5NPM soon will be back on the job as SEC. K5TYW reports he now has enough cards for DXCC. The Arkansas *ARPSC Bulletin* should be back in production and you can obtain a free copy by writing your SCM, whose address is on page 6. Are you a member of the Amateur Radio Emergency Corps? Join now, be glad later. Arkansas amateurs did an excellent job during and after the Conway tornado. Our sincere thanks to all those who helped perform another good amateur service. Net reports:

Net	Freq.	Time	Days	Sess.	QTC	QNI	Ave. Tfc.
OZK	3790	0100Z	Daily	29	149	298	5.1
RN	3815	0000Z	Daily	30	108	466	3.6
APN	3885	1200Z	Mon.-Sat.		(no report)		

The following received Section Net certificates for the Arkansas S.S.B. Net (RN): W5VEP, W5YM, WA5ECP, WA5IIS and WA5IIC. OZK had a very nice month, averaging over 10 check-ins per night for the first time. WA5BBS is reworking his rig. Traffic: W5DTR 161, WA5HNN 136, W5NND 91, WA5BDU 83, W5YM 78, K5TYW 59, WA5FGT 48, WA5GPO 43, WA5IIS 35, WA5IEQ 27, WA5KUD 7, K5AKS 2.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—SEC: W5BUK. RM: W5CEZ. PAM: W5TAV. V.H.F. PAMs: WA5KHE, W5UQR. The BRARC First Annual Hamfest and Dinner was a huge success. K5SGK/K5SGJ have a new 7-Mc. beam up 70 feet. K5UYL has a four-element up 65 feet. W5BV has become a grandfather for the second time. W5ZQZ, W5FJY, W5ZOZ and K5HAA were presented with commendation awards for their work in Hurricane Hilda by "Ma" Bell. W5NOA requests that all remember the Slidell Hamfest Labor Day week end. W5CEW is eager to organize a QCWA Louisiana Chapter. You old-timers who have over 25 years, drop Al a line. WA5EID is the proud possessor of a 1250-watt generator. The East Jefferson High School Amateur Radio Club is now an ARRL affiliate. Officers are WA5HGX, pres.; WA5LTF, vice-pres/secy.; WA5JXL, treas. WA5JVL is now OES and WA5KIV is ORS. WN5KSH reports a new RC has been organized in Basile. The gang meets every Sun. on 3724 kc. at 2 o'clock. WA5HGX sports a new OBS appointment. LAN, our c.w. net, meets daily at 2330 GMT on 3615. WA5BLO still is most active on LAN together with K5OKR, W5IQH, WA5FNB, W5GHP and WA5ITW. W5IQH and W5PM are becoming active with Navy MARS! WA5DES reports BC and other interference make it difficult for OBS on 40 meters. K5HFI built the converter shown in June *QST*. WA5KHE says atmospheric conditions were bad for v.h.f. on 2 meters and 6 meters was quiet. K5FYI spends all his time with Army MARS. K5ELJ is sporting a new SR-160. K5QNK changed QTH with less space for antennas. W5FYZ is active on the lower bands again with a TR-3 both fixed and mobile. K5WOD does a wonderful job at rearodding the Spring Hill area. W5CEZ says the Southwest La. ARC did a fine job in handling communications on 2 meters for the District and National Sport Car Races recently. WA5LTF has been experimenting with antennas including, so he says, an underground 40-meter dipole. W5LDH, our Director, has been extremely active in pursuading all hands to express their opinions on the new FCC proposals. WA5JOL is a new traffic hound on LAN. Traffic: (Apr.) W5GHP 503, W5CEZ 401, WA5FNB 221, W5IQH 193, WA5JOL 126, WA5ITW 120, K5OKR 62, WA5BLO 59, WA5DES 27, K5FYI 6. (Mar.) WA5JOL 27, W5PM 12.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: W5JDF. K5MDX reports No. 300 DXCC, all phone, when he worked 9M4LP. WA5INZ really is working c.w.—his third BPL in 3 consecutive months. W5BW is a very faithful member of CW, S.S.B, and MARS nets. K5VBA/5 has a new Drake 2-B and keyer. W5JDF is proud of his new automatic keyer, and continues to do a fine job with "Miss." WA5GHF is going fine on CAN, RN5 and "Miss." WA5FII has a pair of 4Cx250s to match his Marauder and says c.w. is fun with "Miss." K5RDN has a fine mobile signal with his HW-12. W5CUU worked Honolulu on 75 recently. W5GWD has a KWM-2 with a good signal on 75 and 40 with a Gonset on 5. Several appointments are open. New appointments: WA5INZ and K5VBA/5 as ORSs, WA5LAS as OO. "Miss," 3647 kc, 0045 GMT; Gulf Coast S.S.B., 3925 at 2330 GMT; Magnolia, 3890 at 0100 GMT. Traffic: WA5INZ 539, W5JDF 325, WA5GHF 222, WA5IMU 170, W5WZ 84, WA5FII 59, K5VBA/5 57, W5EMM 12, K5MDX, W5BW 2.

TENNESSEE—SCM, William A. Scott, W4UVP—SEC: W4RRV. RM: W4MXF. PAMs: WA4AIS, WA4GQM, W4RMJ.

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
TN	3635 kc.	M-Sat.	1900C	26	237	180
TSN	3635 kc.	M-W-F	1800C	13	80	50
ETPN	3980 kc.	M-Fri.	0640E	22	430	34
TSSB	3980 kc.	M-Sat.	1830C	26	1169	116
TPN	3980 kc.	M-Sat.	0645C	30	960	241
	3980 kc.	Sun.	0800C			

Congratulations to the Memphis trio of WA4GQM, W4OGG, and K4IBZ on making BPL this month. Sorry to hear of W4GGM's fall from the roof. Crossville Hamfest 17-18 sponsored by the Oak Ridge Club. K4QNI was responsible for communications of the Annual Powder Puff Derby which terminated in Chattanooga. W4TZB returns to the nets from Knox with an NCX-5. W4HHK reports Oscar III results and a new audio filter for weak c.w. reception with 100-cycle bandwidth 20-db. down! K4BTY still is finding intruders in our bands. We need more QNI on TN and TSN. Traffic: WA4GQM 629, W4OGG 436, K4JIG 216, WA4IBZ 189, WA4JVU 173, W4MXF 155, K4SXD 140, W4PQP 94, WA4OXD 58, W4UVP 57, W4YAU 41, W4WBK 35, K4EWI 34, WA4NUJ 32, W4RMJ 25, W4TZJ 24, WA4KHD 21, W4PFP 21, K4WWQ 18, W4CVG 16, W4TYV 13, W4VTS 12, W4TZB 11, WA4IZB 10, W4LLJ 10, WA4HGQ 8, K4LTA 6, K4UMW 6, K4BTY 5, WA4EWW 5, K4UWH 4, W4VJ 3, WA4IRX 2, K4KYL 2, WA4YNF 1.

GREAT LAKES DIVISION

KENTUCKY—SCM, Mrs. Patricia C. Schafer, K4QIO—SEC: K4URX. PAMs: W4BEJ, WA4RDE, K4YZU. V.H.F. PAMs: WA4IUW, K4KZH. RM: WA4LCH. New appointee: K4TXJ/4 as OPS.

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
EMKPN	3960	M-F	0630	22	308	116
MKPN	3960	Daily	0830	30	445	126
KTN	3960	Daily	1900	28	826	375
KYN	3600	Daily	0900 1900	58	443	379

KTN in March held 31 sessions with 907 QNI and 173 QTC. The Louisville and Jefferson County Emergency Net Section 2 in Mar. held 10 sessions with 158 QNI and 26 QTC and in Apr. held 10 sessions with QNI 96 and QTC 5. Ky was represented 93.3% in 9RN in Apr. with K4DZM, WA4LCH, K4CQC and W4RHZ signing in for Ky. W4RCC, WA4LCH, WA4AGH, K4ZRA/4 and K4TXJ4/ made the BPL in Apr. The Danville Amateur Club will have a station at the Scout Exposition to take and relay traffic for the public. The Henderson Amateur Radio Club will hold its Second Annual Hamfest Aug. 8 in Henderson. The St. Mary's College Amateur Radio station has club call, WB4ABF. K4ZZK and K4KZH were married May 7. W8UPB was the guest speaker in May at the KRC in Louisville. W4JUI had another impressive score in the February ARRL Frequency Measuring Test. Traffic: (Apr.) W4RCC 825, WA4LCH 759, WA4AGH 552, W4BAZ 271, K4ZRA/4 196, K4YZU 175, K4TXJ/4 133, WA4RDE 103, WA4HJM 71, WB4ABF 47, W4OYI 46, WA4GMA 39, WA4KFO 33, W4KJP 19, W4CDA 18, WA4UAZ 18, WA4MEX 17, K4VDO 17, WA4KZI 12, WA4GHQ 11, K4LOA 6, K4HOE 5. (Mar.) K4YZU 119.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: K8GOU. RMs: W8EGI, K8QLL, W8ELW, K8KMQ. PAMs: W8CQU, K8LQA, K8JED. V.H.F. PAM: W8PT. Appointments: WA8ENO, K8HLR, W8QQK, W8YAN as ORSs; W8CPZ as EC; W8YAN as OPS; K8HLR as OO. New officers: Oak Park RC—WA8ASQ, pres.; W8IJP, vice-pres.; K8PNZ, secy.; K8KVP, treas.; K8GZI, M/a/t, Davison Area ARC, WA8NTU—WA8CHD, pres.; K8IDSH, vice-pres.; WA8LNS, vice-pres.; K8DYZ, vice-pres.; WA8EQO, secy.; WA8QEP, treas. Metropolitan Ragchewers Club—K8MDZ, pres.; W8CXS, vice-pres.; W8RNY, secy.; WA8EMN, treas.; K8DYN, K8KKK, K8UXS, board. W8WNX reports that 432-Mc. activity has picked up. W8MBH reports that during the Apr. 11 tornado the Detroit area had 54 stations on, with W8JXU as net control, on 145.35 Mc. W8VRB and WA8OBG (father and son) handled contest score communications for the National Rifle Assn. K8EQO has worked 46 Michigan counties on v.h.f. The Grand Rapids Jr. College call is now WA8MTY, on 6 and 2. K8EFK got married. W8HIM is using a Windom antenna. The U.P. Hamfest will be held July 31 and Aug. 1 at 4-H Bldg. at Escanaba; the 12th Annual V.H.F. Picnic Aug. 1 at Allegan State Park. K8TGX has a new HW-12. K8YKT has a new SR-150 and WA8CSR has a new Clegg 99er on 6. WA8LUQ had kidney-stone trouble, and WA8HVN was hospitalized with a heart condition. K8VUB and WN8IFW both won Ford scholarships. K9ZII/8 is "hot-rodding" through St. Joseph Hospital in a wheel chair. WN8OLD has a new Ameco TX-62. K8DYN has a new GC-105 "Gooney bird." WA8CPI worked HR3 and VP2 on 160-meter c.w. W8QBR moved to California. K8TFE has a new HQ-180A, and is burying all wires in the shack. K8CKD now is on RTTY. K8HLR is swamped with college work. W8IWF has a new SR-160 in the auto. WA8FLL built a storm finder. K8IHY now is on s.s.b. W8AHV has moved to 12200 Madonna Dr., Lansing. WA8QBD made General and has an SX-117 and an HT-44. K8YEK is working DX on RTTY. Silent Keys: W8CJB, WA8HEP. BPLers: K8KMQ, WA8CTE, K8TFE. Traffic: (Apr.) K8KMQ 580, K8LNE 400, K8NJW 343, K8QKY 331, WA8BQK 256, WA8CTE 193, K8BYX 115, K8TFE 113, W8BEZ 97, K8EBX 85, K8JED 84, WA8HDM 81, W8ELW 77, K8WQV 67, WA8KXO 64, K8TIY 52, W8RTN 49, K8HZL 45, K8ZJU 41, WA8LRC 39, W8FX 38, W8QQK 34, K8MFO 30, K8QLL 29, W8TBP 27, W8IUJ 22, K8VDA 22, K8KQV 21, W8SH 21, W8PJS 20, WB2SCD/8 19, K8RNN 19, W8HKT 15, WA8JWD 15, W8FWQ 14, WA8HGE 14, W8WVL 12, K8CKD 11, K8HLR 10, K8ZXB 8, K8PYW 7, WA8MEE 6, W8YAN 6, W8IWF 4, W8AHV 2, K8GJD 2, W8AAM 1. (Mar.) K8ZJU 7, K8KQV 5, WA8DXW 4, W8SS 4, W8SSK 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE and K8LGB. PAMs: W8VZ, K8BAP and K8UBK. My sincere thanks to W8DAE for writing and typing my column while I was in the hospital for cataract operations. The recent tornado which hit Toledo with loss of life and property showed it *can* happen in Ohio. Below are listed counties and their ECs: Ashland K8ZHA, Ashtabula K8LXA, Athens W8VCD, Auglaize W8LI, Belmont W8DJD, Butler W8MGA, Champaign W8JXM, Clark W8DCJ, Clermont W8ZRL, Clinton K8PSM, Columbiana W8HRV, Coshocton K8NSE, Darke W8ARW, Erie K8MAZ, Fairfield WA8CVC, Franklin W8ETU, Fulton K8CSX, Gallia W8YPP, Geauga W8EIL, Guernsey W8BMS, Hamilton W8HQK, Hardin K8HSU, Harrison K8LGB, Highland K8CKY, Holmes K8RPO, Jackson W8WRT, Jefferson K8VBH, Knox W8PEN, Lawrence W8EPJ, Licking W8EWD, Lorain K8DNS, Lucas K8TVW, Meigs W8VUS, Mercer WA8MRL, Miami W8THJ, Montgomery W8ILC, Muskingum W8LQB, Perry K8ATA, Pickaway K8GOY, Preble W8ILC, Putnam W8JIZ, Richland W8VTP, Ross K8SUB, Scioto K8BNL, Seneca WA8BUL, Stark W8AL, Summit W8BSH, Trumbull K8RXT, Tuscarawas W8JHJ Van Wert K8PFD, Warren K8BAX, Washington W8VZ, Wood W8VTL, Greene W8ILC. Ohio amateurs: Please note the counties listed below do not have ECs: Adams, Allen, Brown, Carroll, Crawford, Cuyahoga, Defiance, Delaware, Fayette, Hancock, Henry, Hocking, Huron, Lake, Logan, Madison, Mahoning, Marion, Medina, Monroe, Morgan, Morrow, Noble, Ottawa, Paulding, Pike, Portage, Sandusky, Shelby, Union, Vinton, Wayne, Williams and Wyandot. How about you amateurs in these counties talking it over among yourselves and selecting an amateur holding a General Class or higher license to be your EC. Babcock & Wilcox ARC saw two movies: Appointment in Arusha and High Country Safari. Dayton Hamvention had 2498 registering and 668 attending the banquet. The FCC gave 79 the General Class examination with 29 passing the code. W8FJD won a Clegg 2er, K8ALL a Drake R-4, K8AXU a Swan 350, K8ZCV an SR-160 and WA8LOA an NCL-2000. This was the first Dayton Hamvention I have missed since they started, but was in the Cleveland VA hospital for a cataract operation. The Springfield ARC's *The Q-ser* tells us the club will hold a hamfest July 18 at the Fairgrounds. W8CQI has a new Clegg 22. K8RND is home from a hitch in the service, the club's 1965 officers are K8KPZ, pres.; WA8FZS,

vice-pres.; WA8IGD, treas.; WA8IKN, secy.; W8OKB, trustee. Seneca RC heard a talk about Power Distribution by W8POH. Lancaster & Fairfield ARC's *The Rag Chewer* says that W8THU spoke to the code and theory class and W8NTM joined the Silent Keys. South East ARC's *Ham Fax* informs us the club's 1965 officers are K8TSI, pres.; K8AXC, vice-pres.; W8TGX, corr. secy.; Chester, rec. secy. and editor; K8AYT, treas.; W8FFK, K8SVN, K8ZFD and WA8AHU, directors. Cincinnati has a new radio club known as the Crystal Crackers AR Society. The Northern Ohio AR Society is the name of new club in Lorain County with W8OHN as pres. and W8QWI as vice-pres. K8BSH has a new Swan SW-240 and is in the Army. WA8AGV has a new HT-37. K8HGY is portable with a TR3. Tusco RCs *The Beam* informs us the members saw two movies, Repair of Printed Circuit Boards and Project Hope, the Knucklehead Contest will be held this coming Fall and W8FWB attended the New England Division ARRL Convention. W8DAE and K8VBO made the BPL in April. Appointments made in April were W8RYP as ORS, W8LAG, K8JLK, K8JSQ and K8UQA as OBSs. The Ohio S.S.B. Net had 1605 QTCs with 28.6 average and handled 717 during the tornado. Traffic: (Apr.) K8VBO 529, W8UPH 495, W8RYP 417, WA8CXY 409, W8DAE 374, K8PBE 289, K8VBH 210, W8FSM 198, WA8GYT 185, W8RZX 168, WA8FKD 163, WA8AUZ 120, K8UBK 116, K8IMN 104, K8MZT 87, WA8FSX 86, W8LAG 80, K8BYR 78, W8SYD 61, K8ZCZ 60, K8YDR 59, W8NAL 58, WA8HTR 55, W8QCU 53, W8MGA 52, WA8JXM 42, WA8FTX 29, K8VMI 25, K8BNL 17, K8DHJ 17, WA8AJZ 15, W8UZE 15, K8ODG 14, W8ETO 14, WA8EIF 13, W8ETT 12, W8ILC 9, K8LGB 9, W8RZM 8, W8DJD 2, W8IBX 1. (Mar.) W8MGA 30, W8EIF 21, K8YWK 15, WA8BOV 11, K8DHJ 7, K8BNL 5, K8BAP 4, W8DIH 1, W8IBX 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: WA2VYS. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 2400 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; Emergency Coordinators on 146.500 kc. Fri. at 0130 GMT. Appointment: WN2POM as OES. Endorsement: W2URP as OO. Congratulations to K2TXP on making the BPL again. The Overlook Radio Society in Woodstock is a new club. Welcome to the New Rochelle H.S. Club, a recently-affiliated group. Our section had a large turnout in the Feb. FMT, including W2MUH, W2ZSJ, K2DEM, K2LSX, K2UTC and WB2HZY. A cubical quad soon will be installed at WB2HZY. Modulation was the subject at the Schenectady Club with speaker from GE's Advanced Technology Laboratory. New officers at Schenectady include WA2CGD, pres.; W2ODC, vice-pres.; K2ONF, secy.; WA2TAG, treas.; W2DAG, W2MEK, K2DLD and WB2HNO, directors. Division Director W2TUK and Vice-Director K2SJO were speakers at the Albany Club. In New Rochelle, K2UTV/W1BGD, of ARRL, spoke on contest operating. This club again is assisting with operations at K2US, the World's Fair station. K2SJN is a new Asst. Director of the Division. W2GKX of Hammarlund, spoke on DX-pedition at the Westchester ARS in White Plains. WA2ZPD tracked Oscar III on six passes; four successfully for approximately 10 minutes. W2RTE and W2THE are Comm. Chief and Asst. respectively for Southern District Center RACES. Traffic: (Apr.) K2TXP 524, WA2VYS 301, K2SJN 76, WA2JWL 59, WB2DXL 47, W2URP 38, WB2HZY 37, W2ANV 35, W2PKY 34, WA2VYT 33, WB2FXB 24, WA2WGS 21, WB2HYA 16, WB2FOA 9, WA2VYK 8, K2LSX 2. (Mar.) W2URP 21, WB2FYP 4.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. Section nets:

NLI	3630 kc.	1915 Nightly	WA2EXP-RM
VHF Net	145.8 Mc.	2000 TWTh	W2EW-PAM
VHF Net	146.25 Mc.	1900 FSSnM	W2EW-PAM
NYCLIPN	3932 kc.	1600 Daily	WB2HWB-PAM
NLS (Slo)	3630 kc.	1845 Nightly	WA2RUE-RM

NYC-LI AREC Nets: *See Dec. 1694 column for schedules.* W2QPQ, who has long been active in Queens AREC/RACES and the U.H.F. Club of Jamaica, has moved on to Chicago. New officers of TARCOM are W2BPA, pres.; W2FPF, vice-pres.; W2HAJ, treas.; WA2EXI, secy.; W2EAR, act. mgr. WB2LXQ went mobiling thru 1-Land and tried to work 2-Land on 6 but met with little success. WA2TQT and his XYL had an enjoyable visit at ARRL Hq. WA2FUL has wound up the EE stuf at CCNY for this term and is looking forward to a "radio-active" summer. WB2PUK has a new HW-32. Well, WB2AWX of the 13th floor finally beat the "line-of-sight" and snagged a WØ and a W8! K2GGD says he has just discovered "traffic" and is enjoying it immensely. The newly-formed Flatbush Radio Club meets the 1st Mon. of each month at the Midwood Branch of Brooklyn Public Library. Officers are WB2NDI, pres.; K2MOO, vice-pres.; W2-MBU, WB2OGP, WB2MFW, WA2VLF, WB2GQT, WB2-MHL and WB2FXN, organizing council. WB2QFT put up a new dipole for 20-meter DX. W2PF recommends greater use of lower sideband on 20 where he has utilized it to clear traffic in spite of heavy QRM. WA2-DTY handled emergency traffic recently from three different ships at sea. WA2UCP reports Brooklyn RC runs the Tech. Net. Sun. at 1000 EDST on 145.62 Mc. WA2LJS has the Model 15 RTTY ready to go. WA2OOL is heading for Brown U. in Sept., but WA2-QJU is going to Columbia. WB2OTT struggled to get the quad up and three days later a sassy wind blew it down, but not before he made WAC! WB2DBW is toiling to extirpate bugs in the electronic key. Another capricious gust sneaked up on the unsuspecting TA-31 of WB2HWB and dispatched it forthwith into the garden! WA2GPT's OM tangled with a rolling stone that wasn't gathering moss and has worried most of the ligaments in his knee. The rules that define the amateur radio service lead off by describing emergency communications as one of its purposes. That is the reason for our ARPSC. So, why are there so few of us participating? League membership in this section is 3949 with a breakdown as follows: Nassau 933, APO/FPO-NY 455, Queens 699, New York 304, Suffolk 629, Bronx 173, Brooklyn 429, Richmond 64. Although we have 1295 AREC members, only 518 are active. Traffic has 67 members with about 47 active. Does this mean that only 14% of our membership is going to provide the service that justifies our existence? When you consider non-League amateurs it amounts to only 5%. What are we going to do about it? The traffic nets listed at the masthead need more stations. Isn't it sad, particularly in these times, when messages going to Bronx and New York counties with nearly 500 stations have to be mailed. And, can one say that 518 AREC stations in a section serving a community of over 10,000,000 is adequate? Can the "inactives" really believe they will be an asset when disaster strikes? Traffic: WA2RUE 803, WA2GPT 715, WB2HWB 475, WB2MHT 404, WB2EUH 362, WB2AEK 240, WB2DBW 240, WB2LUK 99, W4TRU/2 87, WB2OTT 80, WA2EXP 79, WB2LFL 71, W2GKZ 69, WA2QJU 66, K2DNY 59, WB2IQG 53, K2AAS 51, WA2OOL 39, K2JFE 38, WA2-LJS 34, WB2DZZ 32, WB2LGR 32, WB2HYK 29, W2EC 18, WA2VZN 18, WB2IEQ 15, W2IAG 11, WA2UCP 11, WA2WAO 10, WA2DTY 7, W2PF 5, WB2QFT 4, K2GGD 3, WA2TKS 3, K2YQK 3, WB2AWX 2, W2JTZ 1, WB2-PUK 1.

NORTHERN NEW JERSEY—SCM, Edward F. Erickson, W2CVW—Asst. SCM: Louis J. Amoroso, W2LQP. SEC: K2ZFI. NNJ ARPSC nets:

NJN	3695 kc.	7:00 P.M.	Daily	WA2BLV-RM
NJ Phone	3900 kc.	6:00 P.M.	Ex Sun.	W2PEV-PAM
NJ Phone	3900 kc.	9:00 A.M.	Sundays	W2ZI-PAM
NJ 6&2	51.150 kc.	11:00 P.M.	M W Sat.	K2VNL-PAM
NJ 6&2	146.700 kc.	10:00 P.M.	Tu Sat.	K2VNL-PAM
NJNN*	3725 kc.	7:20 P.M.	MTWTh	WB2KXG-RM

*Novice and slow speed. All times local. AREC net skeds available from K2ZFI. New appointments: WB2-AEJ as RM; K2KDQ as OBS. 50,292 TWTh 9:00 P.M., 50,400 Sun. 9:30 A.M. and 146,898 Sun. 8:30 P.M. local; WB2JWB as ORS. WB2HLH has a 3-band quad in a 60-ft. tree. WA3SRQ has a new Ranger and keyer. The Middlesex County AREC Net meets Sun. at 7:30 P.M. local time on 3675 kc. WB2GFY and WB2ICH are the leaders. WA2KHL has dipoles for 160 through 40 meters. WA2ZKT reports a total of 34 members in the Somerset County AREC. WB2FVO is looking for recruits for a net to be held Mon. through Fri. at 5 P.M. local time on 7070 kc. to be known as the Central Jersey Relay Net. WA2SRQ is NCS of the Empire State Slow Net on Sat. This net meets daily on 3590 kc. at 6 P.M. local time and all are welcome. WA2YOE is on 2 meters with a Two-er. WA2YOE and WB2JID lead the N.W.N.J. AREC with an almost perfect attendance record in the 10-Meter Net which meets Thurs. at 8 P.M. local time on 29.200 kc. WA2SED is the EC. W2NIY is celebrating his 40th year as a ham and has held League appointments almost as long. The Central N.J.V.H.F. Society operated the World's Fair station K2US during the month of May. K2UKQ has a DXCC score of 270/262. Kay has 70 DX YLs. W2ZI has made another trip, this time to the West Coast where he visited antique wireless collectors and other old friends. WA2HGL has made WAC and is a member of the YL International S.S.B. System. Good luck to WB2JCP, who will be off to college in Ohio. Congratulations to WA2WHZ on the receipt of his Extra Class license.

(Continued on page 118)

THE heart of a modern sideband or CW rig — whether a receiver, SSB transmitter, or transceiver, is the bandpass filter used for steep-skirted selectivity. There are a number of criteria used for measuring the effectiveness of such a filter — insertion loss, passband ripple, etc., but the overall indicator of filter merit is *shape factor*. When shopping specs for a new rig, it is particularly important to understand the principle of filter shape factor, and to determine from the spec, if given, what you may expect in performance from the equipment if purchased — whether it be adjacent-channel selectivity in a receiver, sideband suppression in an SSB transmitter, or *both* in a transceiver.

SHAPE FACTOR is the measure of filter skirt selectivity, or the rapidity with which a signal is attenuated as it is moved out of the filter passband. And shape factor is expressed as a ratio — usually the ratio between the bandwidth of the filter at the 6 db attenuation points of the passband, and the bandwidth of the filter at the 60 db attenuation points. The lower the ratio, the better the filter. For example, if a filter with a 1:1 shape factor existed (an impossibility) with a bandwidth of one kilocycle at the 6 db points, the bandwidth at the 60 db points would be the same — one kilocycle. A curve of the filter response would be rectangular. A hypothetical filter with a true shape factor of 1:1 would, oddly enough, pose insurmountable problems in use — the simplest of which would be the problem of placing the BFO or carrier oscillator on the slope of the filter. Since there would not be any "slope" in a 1:1 filter, the BFO signal would be completely outside the passband at all times! So while there is theoretically such a thing as a "too good" shape factor, the problem does not exist in practice — and we can therefore generally say that "the better the shape factor, the better the filter."

FILTER SHAPE factor is closely tied to bandwidth and passband ripple — loosely speaking, the narrower the bandwidth and the less the ripple, the harder it is to maintain a good shape factor. The elements (poles) used to make the filter must be of a certain minimum Q, and the shape factor itself is a direct function of the number of poles — the more, the better. In a filter made up of LC tuned circuits such as in the HRO-500, it is the number of such tuned circuits (or poles) that determines shape factor — in a crystal lattice filter, as in the NCX-5, the number of crystals. Regardless of the *type* of filter element, this relationship still applies directly. For example, a Q-multiplier or a notch filter is a one-pole device — and the high Q obtained by regeneration or by operation at low frequencies provides a very narrow rejection notch at the 6 db point — perhaps only a few *cycles* — but the use of only one lonely pole in a notch filter results in a bandwidth at the 60 db point which is *kilocycles* wide. A two-pole filter (two 455 Kc. I.F. stages, for example) has a typical shape factor of approximately 12:1 — a four-pole filter — such as used in a number of SSB transceivers — provides a shape factor in the neighborhood of 3.5:1 to 4:1. A six-pole filter — 2:1 to 2.5:1. It is interesting to note that the HRO-500 employs a *tunable* six-pole filter using ferrite cup-core tuned circuits operating at 230 Kc. The well-known mechanical filter is typically a seven-pole device with a shape factor of approximately 2.1:1. The NCX-5 transceiver employs the finest filter ever available for amateur use — an eight-pole (eight crystal) lattice filter with a shape factor of 1.7:1; less than 3 db of passband ripple, and approximately 1 db of insertion loss! Our theoretical filter with the 1:1 shape factor would require an *infinite* number of poles, by the way.

OK, now we know what shape factor is — now here's why it is important. Again, in a communications receiver, the shape factor of the filter determines the amount of adjacent channel QRM you hear on SSB, CW, or AM — the better the shape factor, the less the QRM. In an SSB filter rig, the shape factor controls the unwanted sideband suppression. Just by checking the shape factor specification of the filter used in the rig, you can get an immediate idea of how it compares in selectivity or sideband suppression with other equipment. Make certain by the way, that the shape factor spec is based upon measurements at 6 db and 60 db — not 6 db and *40 db* as is sometimes quoted.

THE NCX-5 transceiver, as mentioned above, uses an eight-pole filter for both receiver selectivity and SSB generation. The sideband suppression of the NCX-5 is 50 db minimum. In terms of the receiver section — very simply, you hear much less QRM than with any other transceiver available on the amateur market today. And if you're in the habit of checking the other fellow's sideband suppression by "flipping over to the other side," you'll be surprised at how much better the clean signals really are — now that no increase in level of the received unwanted sideband results because of inadequate receiver filter shape factor.

MIKE FERBER, W1GKX

Behind This Honest Face

Heath Deluxe SB-Series Tuning Dial — with features proven by thousands of satisfied SB-Series owners . . . features you can prove for yourself!

HEATHKIT®

- Calibration accurate to 400 cps on all bands
- Readable to 200 cps
- Bandspread equal to 10 feet per megacycle
- Uniform ⅛ inch spacing between all 1 kc dial divisions
- Backlash less than 50 cps

HEATH COMPANY, Dept. 9-7, Benton Harbor, Michigan 49023
In Canada: Daystrom, Ltd., Cooksville, Ontario

☐ Enclosed is $_____, plus shipping.
Please send model (s)_____
☐ Please send free 1965 Heathkit Catalog.

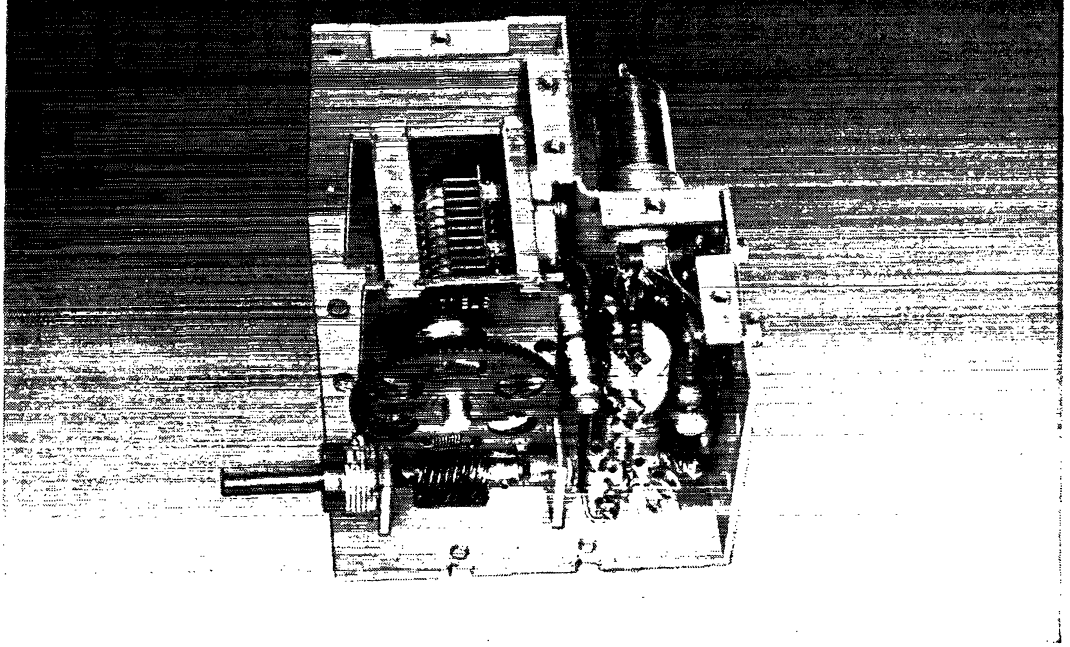
Name_____
(Please Print)
Address_____
City_____ State_____ Zip_____

Prices & specifications subject to change without notice. AM-156

FREE 1965 HEATHKIT CATALOG

See the wide array of Heathkit Amateur Radio Equipment available at tremendous do-it-yourself savings! Everything you need in "mobile" or "fixed" station gear with full descriptions and specifications. *Send for Free copy!*

...Beats A Stout Heart

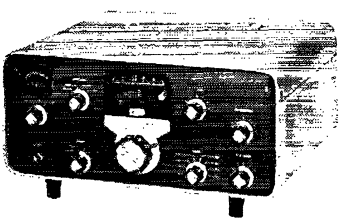


Heath Deluxe SB-Series LMO (Linear Master Oscillator) — with features factory built into the heart of every SB-300 and SB-400 . . . features you can prove for yourself!

• True linear tuning . . . (within 400 cps) • Stable—less than 100 cps per hour maximum drift after warmup • Tuning repeatability better than 50 cps • Rigid mechanical construction • Highest quality components assure years of dependable performance

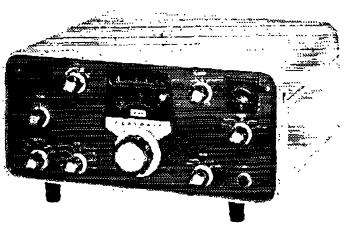
HEATH SB-SERIES PERFORMANCE IS A PROVEN FACT!

Operate 80 through 10 meters on either the SB-300 Receiver or the SB-400 Transmitter—experience the same precision tuning and near-perfect stability on both. And all these features will be included in the 6 meter SB-110 coming in August. But why prove these features on someone else's rig? Order your SB-300 and SB-400 today.



Kit SB-300, less speaker, 23 lbs. . . . $27 dn., $22 mo. **$265.00**

Export model available for 115/230 VAC, 50-60 cps: write for prices.



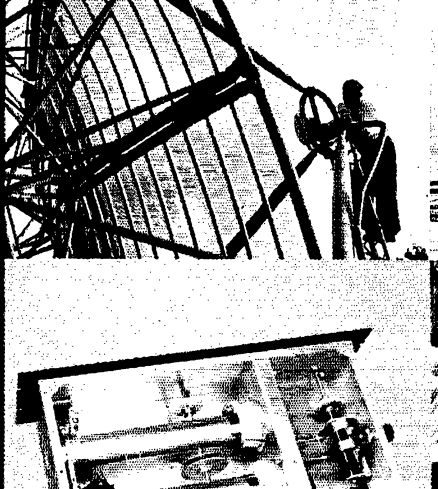
Kit SB-400, 33 lbs. . . . $33 dn., as low as $22 mo. **$325.00**

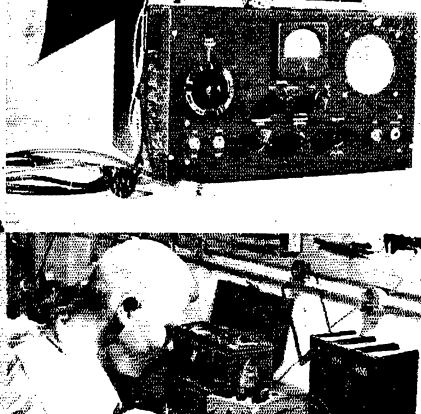
Export model available for 115/230 VAC, 50-60 cps: write for prices.

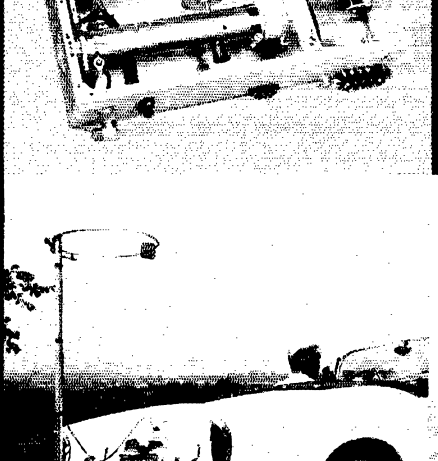
THE RADIO AMATEUR'S V.H.F. MANUAL

$2.00

PRINCIPLES AND PRACTICE FOR THE WORLD ABOVE 50 MC.







PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

(Continued from page 112)

Congratulations to W2TPJ on making the "Over 300 Notices" OO Honor Roll. WB2QEA has 5 states on 6 meters. WB2GKB worked Mexico on that band. WB2KLD gave a talk on amateur radio to his high school class; WA2OOD is planning to go on RTTY. K2RDX has difficulties with a varactor multiplier but reports good success with a *beer can* balun! WB2ALF, K2CM, WA2INB, and W2CVW attended the Convention in Swampscott, Mass. W2CVW received a 50-w.p.m. code award from the Connecticut Wireless Association. I would like to hear from other NNJ stations who are participating in the W1EIA program. Pvt. Raymond E. Donadt, K2PTU is stationed in Korea. Co. B, 7th Aviation Batallion (APO SF96207) working with Drones. Traffic: (Apr.) K2VNL 347, WB2AEJ 316, WA2VID 214, WA2TEK 149, WB2HLH 140, WA2SRQ 140, WB2GFY 126, W2CVW 85, K2KDQ 72, WB2KSG 68, WB2ICH 40, K2DEL 38, WB2IYO 38, WA2GQZ 36, WB2KLD 33, WB2FIT 32, WA2WAJ 31, WA2UOO 30, W2PEV 26, WB2JWB 20, W2TFM 20, K2ZFI 20, WA2DEW 18, WA2KHL 17, WB2MAT 11, WA2MYB 10, K2SLG 9, WA2ZKT 6, W2DRV 5, WB2FVO 5, WA2TWS 5, W2JDH 4, W2ZAL 4, W2NTY 2, WA2PWI 2, WA2CCF 1, W2EWZ 1, WA2WHZ 1. (Mar.) WB2ALF 145, WA2UOO 70, WA2SRQ 51, WA2WHZ 7.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—Asst. SCM: Ronald M. Schweppe, KØEXN. SEC: KØVBM. RMs: WØLGG, WØTIU. PAMs: WØNGS, WØLSF. The Midwest Division Convention was a success beyond our greatest hopes. Congratulations to Robert Denniston and all his fine assistants and our thanks to all who supported it by attending and taking part in our various programs. Our SEC, K2VBM, reported the meeting enjoyable and informative. Your SCM was prevented from attending by a sudden crisis in his family. Our condolences to the family of the late Leland Cheney, SCM of Kansas, who passed away shortly after our convention. April was a month of floods. A book could be written on this subject, if all the interesting and important happenings were to be told. Instances of devotion to public service, without hope or expectation of reward, are without number. Our Governor Hughes asked that 83 of 99 counties be designated flood disaster areas, and his request was granted after the president's inspection of the area. Amateurs helped in all areas, and it is my pleasure to congratulate and thank them in behalf of organized amateur radio. Net reports: 160 Meters—QNI 759, QTC 16, sessions 30. 75 Meters—QNI 1371, QTC 120, sessions 30. Hamilton County—QNI 207, QTC 2, sessions 30. TLCN (Mar.) QNI 227, QTC 20. Traffic: (Apr.) WØLGG 1503, WAØFSW 586, KØASR 142, WØUSL 99, KØQKD 82, WØNTB 76, KØEVC 20, WØBTX 16, KØKAQ 15, WØQVZ 14, WØBLH 10, WAØFEX 10, WØGPL 10, KØTDO 10, WAØDYV 9, WØPTL 9, WAØDRW/Ø 8, WØYDV 8, WØREM 7, WAØAUF 5, WØNGS 5, WØATA 4, WØBKR 4, WØFDM 4, WAØDNZ 3. (Mar.) WAØFSW 111. (Feb.) WAØFSW 122.

KANSAS—Acting SCM/SEC, Robert M. Summers, KØBXF—PAMs: KØEFL, WØBOR. V.H.F. PAMs: KØVHP, WØHAJ. Sincere sympathy from all the amateurs in Kansas to Peggy Cheney, widow of WØALA, SCM Kansas. We will all miss Lee.

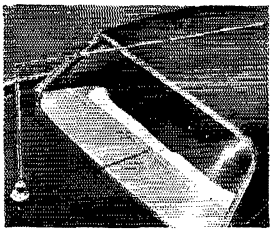
Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*	*QNI*
KWN	3840 kc.	1830 CST	Mon.-Sat.	25	25	326
NCSs:	KØEMB, WAØCCW, KØZDQ					
QKS	3610 kc.	1830 CST	Mon.-Fri.	17	18	
NCSs:	WØBYV, WØVBQ, KØBXF, WAØFCO					
KPN	3920 kc.	0645 CST	Mon.-Wed.-Fri.			
		0800 CST	Sun.	16	95	319
NCSs:	WØORB, KØGII, KØEFL, KØUER					

April reports were received from OO WØPFG and OES WAØDZI. WØZUX was active in welfare traffic concerning victims of the tornados in Indiana. The Wheat Belt Amateur Radio Club plans to operate Field Day at Oberlin, Kans. The Jayhawk Amateur Radio Club will be at Wyandotte Count Lake, near Kansas City, Kans. The Scott County Radio Club also is planning Field Day activity. The Boot Hill Amateur Radio Club is conducting a Novice Class for future hams in Dodge City. The JARS in Wyandotte County recently acquired a TA-33 SR and soon will have it up and DXing. The CKRC of Salina recently invited the members of the CB Radio Club to attend its monthly meeting in hopes of showing the best side of ham radio. WØICV reports he is back in Topeka and expects to be active in the nets soon. All nets still need your support. Hope many will attend the hamfests scheduled this year in Kansas. Traffic: (Apr.) KØGII 256, WAØCCW 50, KØBXF 41, WØBYV 33, KØEMB 18, KØEFL 14, WØZUX 10, WØICV 7, KØJMF 7, WØFDJ 5, KØVQC 5. (Mar.) WAØDZI 4.

High Efficiency Top Loading...Designed For New High Power Linears – 10 thru 75 Meters

Unique Hy-Gain TOPPERS are designed to deliver you the very most...in performance and in reliability. One glance tells you the difference...no bulky loading coil at the center or base of the antenna...just a slimline tapered whip that defies wind resistance. It mounts on a heavy gauge mast that folds for garaging and is easily removed without tools when you want to work another band.

Performance-wise, with a TOPPER, it's like you're "sitting on top of the world." Unique top loading of TOPPERS insures maximum efficiency by providing a minimum compromise in natural current distribution and by raising the feed point impedance to provide an optimum transfer of RF energy. A stainless steel tuning rod at the top of each TOPPER allows easy tuning to exact frequencies.

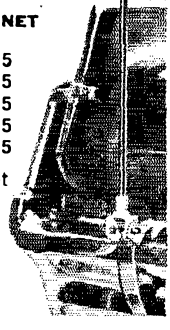


Reliability-wise, TOPPERS are superb. TOPPER whips are made of durable ⅜" fiberglas rod with a highly efficient, small diameter loading coil permanently encapsulated in polyethylene plastic at the top. Fused to the bottom of each TOPPER is a stainless steel "quick-disconnect" which is heavy spring loaded to insure an uninterrupted current flow. One 3' heavy gauge mast with "stable-fold" fitting, male "quick-disconnect" and a ⅜"x 24 stud designed to fit any standard mount accommodates all TOPPER models...for 10, 15, 20, 40 and 75 meters.

For the most in performance and reliability...

MODEL	FREQUENCY	MAX. POWER SSB	MAX. POWER AM	HEIGHT	HAM NET
TL-10	10 Meters	1 KW P.E.P.	250 W	Approx. 5'	$7.95
TL-15	15 Meters	1 KW P.E.P.	250 W	Approx. 5'	7.95
TL-20	20 Meters	1 KW P.E.P.	250 W	Approx. 5'	7.95
TL-40	40 Meters	300 W P.E.P.	125 W	Approx. 5'	9.95
TL-75	75 Meters	300 W P.E.P.	125 W	Approx. 6'	11.95

Topper Mast – Model TM-36 For body or bumper mount **$7.95** Ham Net



See them today at your favorite Hy-Gain Distributors or write for address of the Hy-Gain Distributor nearest you.

HY-GAIN ELECTRONICS CORPORATION

8413 N.E. Highway 6 – Lincoln, Nebraska

MISSOURI—SCM, Alfred E. Schwaneke, WØTPK—SEC: WØBUL. RMs: KØONK, WØOUD. PAMs: WØBVL, WØBUL, WAØFLL (v.h.f.), WØOMM, KØONK. New appointments: KØHNE as OPS-OO; WAØFKD as ORS. Appointments renewed: WØOUD as RM; KØJWN as OBS; WØOGC as EC. WAØEMX is net manager of the new Mid-America Teenage Net (TEEN). The Hambuchers Net report will appear in this column for 3 months. WNØMDH is a new Novice in Rolla. WNØMAE and WNØMAD are new in Mexico. WAØKIC and KØIRL received Gen. Cl. license. WAØKNV, Central Mo. State College ARC, set up a demonstration of ham radio in Student Union, Apr. 29. KØGSV reports more activity in the Mo. QOS Party this year. KØJPL acted as NCS for the Indiana Emergency Net during the tornado disaster. WAØHMN and WAØLEQ are mobile on 2 for RACES. KØJWN has a fallout shelter with emergency power. WØOIV is Communications Officer for Mo. C.D. and RACES. WØAMO worked Texas while mobile on 6. V.h.f. activities are increasing. Please note: The manager of any v.h.f. net which handles traffic and will report it regularly to the SCM is eligible for PAM (v.h.f.) appointment if he is a member of ARRL. Net reports:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNT*	*QTC*	*Mgr.*
MEN	3885	2345Z	M-W-F	12	249	49	WØRCL
MON	3580	0100Z	Tu.-Sun.	26	139	152	WØOUD
MNN	3580	1900Z	M-Sat.	26	96	65	WØOUD
SMN	3580	2200Z	Sun.	4	19	23	WØOUD
MoSSB	3963	2400Z	M-Sat.	26	592	206	WØOMM
PHD	50.4	1245Z	Wed.	4	51	4	WAØFLL
PON	3810	2100Z	M-F	22	303	235	WØHVJ
HBN	3880	1805Z	M-F	22	791	240	KØEQY
TEEN	3935	2300Z	M-S-F	8	77	81	WAØEMX

Traffic: (Apr.) KØONK 1469, WØEAO 603, KØOYV 559, WAØFKD 336, KØEQY 316, WØOMM 221, WØOUD 189, KØHNE 108, KØYGR 96, WØHVJ 75, WAØILQ 64, KØAEM 61, WAØEMX 51, KØJPS 36, WAØDGT 29, WAØBGU 21, WAØCWV 21, WØKIK 20, WAØDKT 18, KØJPL 16, WØBUL 15, WØTPK 14, KØWOP 13, WØBVL 9, WØGQR 6, KØVNB 4, WØRTO 3, WAØFLL 2, WØGCL 2, KØBWE 1. (Mar.) WØTPK 7.

NEBRASKA—SCM, Frank Allen, WØGGP—SEC: KØJXN. Appointments: KØODF, AEC, Dawes County. Monthly net reports: Nebr. Emergency Phone Net, WAØBID, QNI 1171, QTC 133; 100% check-ins: WAØBOK, WØCXH. Morning Phone Net, KØUWK, QNI 901, QTC 68. West Nebr. Phone Net, WØNIK, QNI 590, QTC 69. Neb. C.W. Net, WAØGHZ, 1st sess. QNI 135, 2nd sess. QNI 126, QTC 55. Nebr. Storm Net, KØJXN, 2 sessions, 1094 QNIs, 32 QTCs. AREC Sunday Net, WØIRZ QNI 114. AREC members rallied state-wide to assist in two major disasters, the Halsey Forest Fire and the Primrose Tornado. Many thanks to all amateurs who participated and *congratulations on a job well done.* WØYFR reports that the 160-Meter Net has suspended operations for the season. Last season was well represented with 22 states and one Canadian province among the QNIs. Traffic: WØLOD 178, WAØGHZ 166, WAØBID 125, WAØBIE 54, KØRRL 39, KØFRU 32, WØVRE 32, WØGGP 30, KØKJP 28, WAØEUM 26, WAØIXD 25, WØNIK 25, KØHNW 21, WØFQB 20, WØYFR 20, WØHYD 16, WØBFN 15, WAØEEI 15, WØVEA 15, WAØHRX 14, KØOAL 12, WAØGVJ 11, WØRJA 11, KØUWK 11, WØZJF 11, KØJFT 10, WAØCEZ 9, WØHOP 9, WAØJAV 8, WØWKP 8, WAØAES 7, WAØIXF 6, WØNOW 6, KØULQ 6, WØWZR 5, WØFBY 4, WØPHA 4, KØDIN 3, KØVTD 2, WØCIW 1.

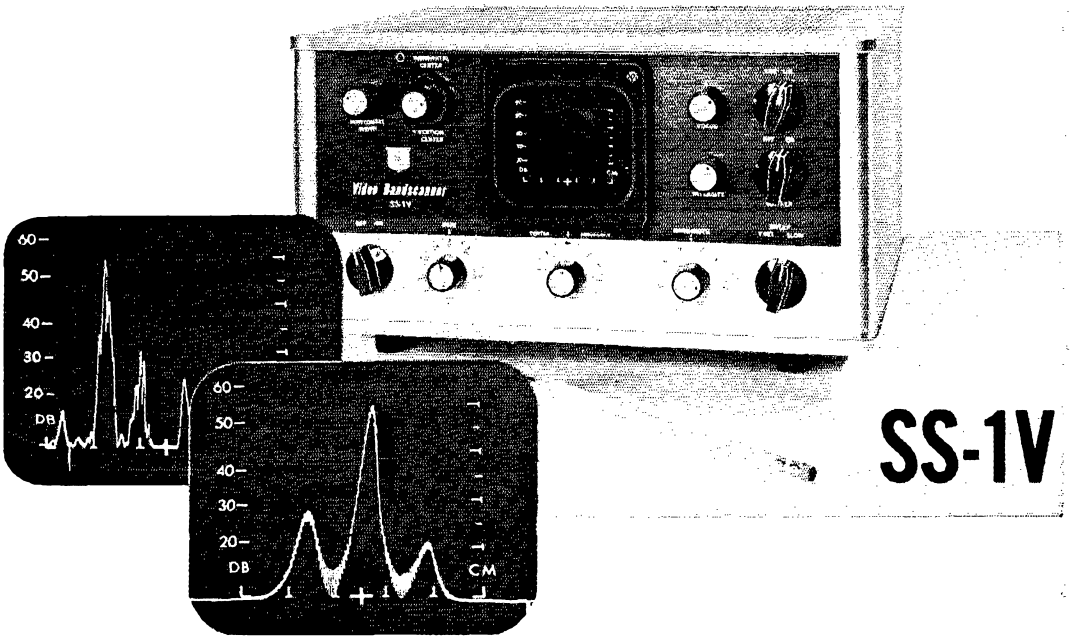
NEW ENGLAND DIVISION

CONNECTICUT—SCM, Fred Tamm, K1GGG—SEC: W1EKJ. RM: W1ZFM. PAM: W1YBH. V.H.F. PAM: K1RTS. Net reports:

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
CN	3640	Daily	1845	28	293	283
CPN	3880	M-S	1800	29	15 (ave.)	149
		Sun.	1000			

CTN manager W1RFJ reports 3 sessions (Mar.) and welcomes new stations every Sun. at 1800 on 3640. K1PJQ reports that CNEN held 26 sessions with 773 QNI in April. Join an organized message traffic group of your choice and learn the ropes of handling traffic, it might come in handy some day, and collect a bonus of personal satisfaction serving the public with your chosen hobby. Welcome to the Cromwell ARS and Southern Berkshire ARC, newly affiliated clubs. W1IOW reports the forming of a club at Groton Sub Base. WA1ALZ, K1WKK, K1FQT, K1GGG and W1BDI are forming a section RTTY net. Contact WA1ALZ for details. K1RTS has some good tapes of Oscar III and is available for talks at your clubs. W1VNJ and WA1CYM have new stations on 2 meters and K1OQK has the "green buttons" going. K1QNF is working on a new rig. K1HJV will host the Mobileers July 4 at his QTH. July 1 through 3 will be QRL for the

NEW Dimension in Amateur Reception from SS



SS-1V

THE SS-IV Video Bandscanner adds a completely new dimension for enjoyment of amateur reception, while simultaneously providing a capability for operating efficiency and precision that has heretofore been possible only through the use of extensive laboratory equipment.

Used with the SS-1R, the SS-1V shows all signals in the band in use. Alternatively, any portion of the band can be expanded to full screen for detailed examination. Both linear and logarithmic displays are provided. A unique feature is that the signals displayed do not move as the receiver is tuned, but a marker pip constantly shows the exact frequency to which the receiver is tuned. The sharp resolution of this unit permits observation and measurement of two AM sidebands displaced only 2.5 kc. from the carrier (see inset).

A turn of the SS-1R bandswitch allows monitoring of "dead" bands at a glance without de-tuning the receiver. DX chasing can become almost a science – "pile-ups" can be detected visually; with practice it is possible to "work" one DX station while observing the behavior of another (or several) at different frequencies. The motor tuning feature of the SS-1R is a real aid in moving up or down the band quickly to copy signals detected with the SS-1V.

In addition to providing these unique operating advantages, the SS-1V is truly a precise instrument capable of many oscilloscope measurements both with the SS-1R and alone, including complete monitoring of a transmitter (RF envelope, "Christmas tree", trapezoidal patterns, etc.) analysis of received signals (overmodulation and distortion products, carrier shift in both amplitude and frequency, audio harmonic distortion, intermodulation distortion, parasitics, etc.) as well as use of the SS-1V as a general purpose oscilloscope.

In this case, one picture is worth a thousand words! Operators' who have once used the Bandscanner "don't know how they got along without it." See the one picture at your favorite distributor.

SPECIFICATIONS

Frequency Coverage: Same as SS-1R, 500 kc segments
Dispersion: (display bandwidth) 500 kc max. 4 kc min.
Resolution: less than 2 kc; nominally 1 kc in slow sweep and min. dispersion
Sweep Rates: Nominally 30 and 15 cps.
Sensitivity: With SS-1R, less than 1 μv for 1/2 cm. deflection
Dynamic Range: Log 60 db, Lin 20 db
Input Frequency: 5.0 - 5.5 MC (SS-1R first i.f.)
Acceleration Potential: 2,500 V., dynam. regulated
Auxiliary Inputs and Outputs: (all connectors phono)
a) 6.0 - 6.5 MC (SS-1R VLO) for marker
b) Vertical plates
c) Envelope detected horizontal R.F. input
d) Vertical video amplifier input
e) Video out (for aural monitoring)
Size and Weight: 7½" H x 13¼" W x 13" D; 18 lbs.
Power Input: 50 W 115 VAC 50/60 cps
Tubes and Diodes: 14 tubes, 5 silicon diodes, 4 germanium diodes, 1 Zener diode, 2 varactor diodes

AMATEUR NET $395.00

Squires - Sanders, Inc.

MARTINSVILLE ROAD, MILLINGTON, N. J. 07946

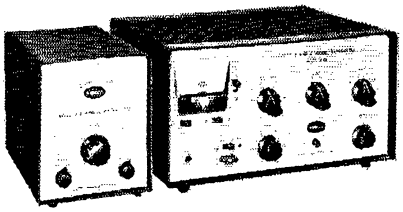
Stratford gang operating W1ORS/1 at the Bridgeport Barnum Festival radio exhibit and message center. K1SRF passed the Extra Class test at Swampscott. New appointments: K1RQO and K1LMS as ORS, WN1DUV as OES, K1QGC as OO. Endorsements: W1YBH as OPS; W1BNB as ORS, AREC; WA8LEE/1, WA1DHX, WN1EAW, FMT; W1PRT. Reports received: W1EQV, OO; K1RTS, WA1CPU, K1QNF (Mar.), OES. Net certificates issued: K1FQT, K1LFW, K1SRF, W1BGD made the BPL again. The Norwich area AREC participated in a search for a lost child with K1SRF, K1MRL, K1LMS. W1AIP and K1ZKY providing mobile communications. WA1DNM, currently in the Navy, finds enough time to experiment with moonbounce and has fine equipment operating on all bands from his home QTH in Storrs. Traffic: (Apr.) W1BGD 532, K1FQT 274, K1OQG 191, W1ZFM 152, W1EFW 151, W1NJM 151, K1EIC 129, K1STM 106, K1EIR 93, KRQO 74, K1GGG 51, W1BDI 49, K1YGS 49, W1QV 47, W1CTI 36, W1YBH 36, W1OBR 19, K1SRF 18, K1YGS 12, W1BNB 10, K1LMS 7, WA1ALZ 5, W1CUH 5, WA1CCR 2, W1GKF 2. (Mar.) W1NJM 214, W1YBH 47, W1RFJ 43, W1OBR 12.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1AOG, our SEC, received reports from these ECs: W1s VUO, STX, JVZ, K1s ICJ, ZQL, DZG. W1ZLX is the new PAM for 10 meters. W1s PLJ, BGW WAJ, AYG, VAH, TZ, K1s WJD, CCL, MEM and QDR took part in the Feb. FMT. The 6-Meter Crossband Net held 23 sessions, 465 QNIs, 110 traffic. Net certificates have been issued to K1s IWF and MTT. K1BGK says that this net and the Post Office Net held a special session on Sat. to handle traffic for the East Coast Model U.N. Conference which was held at the High School in Newburyport. A letter of thanks was received from K1-SGO, Supt. of schools. K1FMW is a Silent Key. K1UCC and K1EPL are on several bands. W1AFZ is back on the air with an NCL-2000, an NCX-5 and a beam 210 feet up. W1CDN is a new ORS. WB6HQJ, ex-K4HTO, now in Chelmsford, has a Swan transceiver. Heard on 75: K1s LUI and FKK. W1PEX, K1VPJ and WA1CRK made the BPL. K1RPK is on 6. The T-9 RC held its annual Ladies Nite. K1DZG is going up to VO1-Land on vacation. WA1-DJC is getting out with a DX-40. W1HIL has retired. W1GAG will retire and move to Maine. K1RWZ is putting up a TA-33 to work DX on 20. WA1CAB has an HQ-170. WN1DBD is teaching code and theory to a ham-to-be. W1s QP and PY had a QSO after 40 years and met at the convention. K1VGM is on 20-meter c.w. K1UCT now in Whitman has a 60-ft. Tower, ten-element beam and RTTY on 6. The RTTY Net meets Tue. at 9:30 P.M. with K1YVY as NC. W1EKG says that W1s JSM and JZD did a nice job helping others to copy Oscar III with their various reports, etc. W1DOF is the new Commodore of the Pleasant Park Yacht Club. W1s LUE and JFS are going strong on 10. W1NTX is back on. W1MRQ was back in the hospital. W1AKN has RV3-TR3-SB-200 and a Drake 2B. WN1DCT has DX-60, HE-40/HD-II Q. Officers of the Minuteman ARC: W1TTD, pres.-secy.; W1RNG, vice-pres.; K1KZL, treas. W1KBN lost some antennas. W1NF heard Oscar III ten times with a b.f.o. in his Gonset. WA1CRK is going back to N.Y. after he gets his degree from M.I.T. K1ESG's antenna came down. WA1CRR is General Class now. K1ZHS has an SB-200 linear. WA1DED has her Tech. WA1DLT has several commercial licenses. WN1CFX passed the General Class exam. Middlesex RC has a net on 7191 kc. at 1900 for Novices. WA1CEV has a new five-element beam for 6. Appointments endorsed: W1s EHT, JPJ, HNW, SH, MOJ K1DZG/K1HZU as ECs; W1CLJ as ORS; K1KUY as OES; W1HIL as OPS; W1RST as OO. Congrats to W1BB as "Ham of the Year," also to K1PNB for his article in *QST*. Malden ARA is now an ARRL affiliated club. The Framingham Club held an auction. K1PQG has quite a setup of rigs and antennas. Wellesley ARS held its annual meeting. The best news for us in this state is that in 1966 we can have our calls on our license plates. W1LEL made WAC on 20 in 2 hours. W1LJC asks the gang to watch for his son, WA1DOK/KL7 at Anchorage, Alaska. *W1WAJ is gradually getting back on the air. The* Bedford Club visited the *Boston Globe's* plant. EM1CWN held 25 sessions, 146 QNIs, 113 traffic. K1HZU has a new QTH. EM12MN held 22 sessions, 248 QNIs, 231 traffic. K1MAK says that the 6-Meter Mobileer Club will hold a "Jamboree" at the Weymouth Fair Ground Aug. 8. K1BPJ operates v.h.f. as well as in the YL International S.S.B. Communications 7-day group on 14.33 Mc. and has just joined the OOTC. Traffic: (Apr.) W1PEX 1463, WA1CRK 585, W1OFK 225, K1VPJ 177, W1EMG 174, K1BGK 150, W1DOM 108, K1VOK 101, K1ESG 73, WA1CSG 47, W1-AOG 45, W1SIV 41, W1CTR 37, W1LES 36, WA1CRR 22, K1LCQ 20, K1ZHS 20, WA1DED 18, W1ZLX 16, K1WJD 14, K1GKA 13, WN1DEC 10, WA1DLT 10, WA1CEV 8, WN1CFX 6, W4YAC/1 6, K1OWK 2. (Mar.) K1LCQ 20, W1JDP 13, WA1CEV 11.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC: K1-QIG. PAMs: K1BXI, K1ZVN. RM: WA2NPU. V.H.F. PAM: K1OYB. Traffic nets: Sea Gull Net, 3940 kc. 1700

AMECO *Leader in Compact, Quality Ham Gear*

NEW VFO FOR TX-62 or any other VHF TRANSMITTER



NEW AMECO VFO FOR 6, 2 & 1¼ METERS

The new Ameco VFO-621 is a companion unit designed to operate with the Ameco TX-62. It can also be used with any other commercial 6, 2, or 1¼ meter transmitter.

Because it uses the heterodyne principle and transistorized oscillator circuits, it is extremely stable. An amplifier stage provides high output at 24-26 MC. The VFO includes a built-in solid state Zener diode regulated AC power supply.

This new VFO is truly an exceptional performer at a very low price **Model VFO-621 $59.95 net.**

The NEW AMECO TX-62

In response to the demand for an inexpensive compact VHF transmitter, Ameco has brought out its new 2 and 6 meter transmitter. It is easy to tune because all circuits up to the final are broadbanded. There is no other transmitter like it on the market!

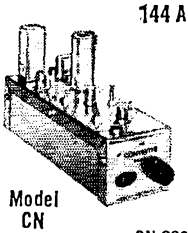
SPECIFICATIONS AND FEATURES

Power input to final: 75W. CW, 75W. peak on phone.
Tube lineup: 6GK6—osc., tripler, 6GK6 doubler, 7868 tripler (on 2 meters) 7984-Final. 12AX7 and 6GK6 modulator.
Crystal-controlled or external VFO. Crystals used are inexpensive 8 Mc type.
Meter reads final cathode current, final grid current and RF output.
Solid state power supply.
Mike, key jack and crystal socket on front panel. Push-to-talk mike jack.
Potentiometer type drive control. Audio gain control.
Additional connections in rear for key and relay.

Model TX-62 Wired and Tested only $149.95

AMECO EQUIPMENT CORP. 178 HERRICKS RD., MINEOLA, L. I., N. Y.

NUVISTOR CONVERTERS FOR 50, 144 AND 220 MC. HIGH GAIN, LOW NOISE



Model CN

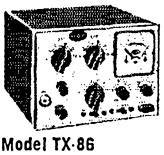
Has 3 Nuvistors (2 RF stages & mixer) and 6J6 osc. Available in any IF output and do NOT become obsolete as their IF is easily changed to match any receiver. Average gain — 45 db. Noise figure — 2.5 db. at 50 Mc., 3.0 db. at 144 Mc., 4.0 db. at 220 Mc. Power required 100-150V. at 30 ma., 6.3V. at .84A. See PS-1 Power Supply. Model CN-50W, CN-144W or CN-220W wired, (specify IF.) **$49.95.** Model CN-50K, CN-144K or CN-220K in kit form. (specify IF.) **$34.95**

ALL BAND NUVISTOR PREAMP 6 THRU 160 METERS

MODEL PCL, Wired, $24.95
MODEL PCLP, with built-in power-supply, wired, $32.95

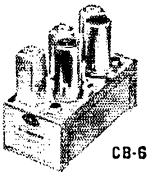
2 Nuvistors in cascode give noise figures of 1.5 to 3.4 db. depending on band. Weak signal performance, image and spurious rejection on all receivers are greatly improved. PCL's overall gain in excess of 20 db. Panel contains bandswitch, tuning capacitor and 3 position switch which puts unit into "OFF," "Standby" or "ON," and transfers antenna directly to receiver or through Preamp. Power required—120 V. at 7 ma. and 6.3 V. at .27 A. —can be taken from receiver or Ameco PS-1 supply. Size: 3"x5"x3".

COMPACT 6 THRU 80 METER TRANSMITTER



Model TX-86

Handles 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight thru on all bands. Size — only 5" x 7" 7 7" — ideal mobile or fixed. Can take crystal or VFO. **Model TX-86 Kit $89.95 — Wired Model TX-86W $119.95. Model PS-3 Wired $44.95. Model W612A Mobile Supply wired $54.95.**



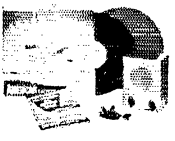
CB-6

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. $19.95
CB 6W — wired & tested ... $27.50
CB-2K — 2 meter kit, 6ES8 1st rf amp., 6U8 — 2nd rf amp/mix, 6J6 osc. $23.95
CB-2W — wired and tested. ... $33.95
Model PS-1 — Matching Power Supply — plugs directly into CB-6, CE-2 and CN units. **PS-1K — Kit ... $10 50**
PS-1W — Wired $11.50

EASY TO UNDERSTAND AMECO BOOKS

Amateur Radio Theory Course **$3.95**
Amateur License Guide ..... **.50**
Radio Operators' Lic. Guide, EL 1-2 ..... **.75**
EL 3 ..... **1.75** EL 4 ..... **1.25**
Amateur Log Book ..... **.50**
Radio Electronics Made Simple **1.95**

CODE PRACTICE MATERIAL



Ameco has the most complete line of code records, code practice oscillators and keys. Code courses range from start to 18 W.P.M. and are on 33, 45, or 78 r.p.m. records. Model CPS oscillator has a 4" speaker and can be converted to a CW monitor.

Write for details on code courses and other ham gear.

Dept. QST-7

Ameco equipment at all leading ham distributors.

AMECO EQUIPMENT CORP.
178 HERRICKS RD., MINEOLA, L. I., N. Y.
Affiliated with American Electronics Co. and Ameco Publishing Corp.

to 1800 and 2000 to 2100 local time Mon. through Sat., Pine Tree Net C.W., daily on 3596 kc.; Two-Meter Phone and Traffic Net, 145.08 Mc. Thurs. 1930 to 2030 hours; c.d. nets Wed. and Sun. A meeting was held by the Down East Radio Club at Machais Apr. 18 with very good results with the following present: W1IUG, W1MID, W1JSH, W1BSB, K1GPP, K1HIC, K1GWX, K1ZXM, K1FKZ, K1ERM, WN1CPS, WN1CUB, K1DYG. The ARRL Convention at Swampscott was attended by a large number of amateurs from Maine. The many displays, meetings and all were very interesting and enjoyed by all. Many of our nets still are going through the hard work of the net control stations. A list of those stations follows: Sea Gull Net, K1TVT, K1WQY, WA1ADK, K1ZVN, K1NFL, K1UXZ, WA1BMR, K1GUP, K1SZC, K1BXI; Pine Tree Net, K1NAN, K1ZVN, K1WQY, K1QIG, WA1ADK, K1TMK. Others who have helped very much are W1RVV, K1TEV, K4BSS/1, KØKPU/1, K1MZB, K1ZIL, K1MDK, K1LHE, K1YSK and, of course, all the stations that handle the traffic. Traffic: K1TMK 193, K1NAN 104, WA1ADK 63, K1TVT 26, K1UXZ 7, K1MDM 5.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1SWX/K1DSA—SEC: W1ALE/W1TNO. PAM: K1APQ, 1CM: W1DYE. The Granite State Phone Net meets on 3842 kc. (alt.3845) Mon. through Fri. at 2300Z and Sun. at 1330Z. VTNH Net meets on 3685 kc. Mon. through Fri. at 2230Z. W1TFS and W1JB did a fine job in the February FMT. GSPN had 416 check-ins vs 20 traffic while the VTNHN had 64 and 31 traffic. GSPN certificates went to WA1CPQ and W1FOG. W1AIJ is active in OCD and also is Field Day chairman for the Concord Brasspounders, W1OC. W1TFS has a new HW-12. The Laconia gang has a 2-meter net Tue. at 8 P.M. on 146.7 Mc. and hopes that many of our summertime hams on vacation will check in. K1DWK's MVAREC Net reports 42 check-ins and 1 traffic. W1PZA is back on the air on 432.2 Mc. Was pleased to meet many of the N.H. gang at Swampscott. I hope I did not miss too many, as various meetings kept me quite busy. Congratulations to W1CNX, your new Asst. Director of N.H. Welcome to new XYL, WN1DZX, of Manchester. Traffic: K1BGI 80, W1ALE 78, W1SWX 15, W1AIJ 5.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. PAM: W1TXL. RM: W1BTV, V.H.F. PAM: K1TPK. RIN report, 22 sessions, 82 QNI, 52 traffic. RISPN report, 30 sessions, 478 QNI, 135 traffic. K1CZH/KM6, stationed at Eastern Island with the U.S. Navy, has held radio contact with several of his R.I. hams on 20 and 80 meters. Hams wishing KM6 contacts will find Roger on 3502 and 3895 kc. He works 160-meter c.w. on 1998 kc. and will work anyone wishing accurate propagation and signal reports from his QTH. The NCRC Club of Newport had W1TXL report on the proposed rule changes by the FCC at the club's last meeting. Club president W1IFF appointed a committee to assist in the code classes. The W1AQ Club of Rumford reported that eleven of its members attended the N.E. Convention at Swampscott. The club issued WRI Certificate No. 64 to LA2MA. K1TPK has a new tower with two four-element stacked beams for 6 meters and an eleven-element beam for 2 meters. W1OP held its Annual Dinner Dance with a large number of the members and their families present. Also present were N.E. Director W1QV and SCM K1AAV. Traffic: W1TXL 538, W1YNE 115, W1BTV 113, K1YEV 50, K1TPK 34, K1VYC 31, K1-USD 26, K1EWL 4.

VERMONT—SCM, E. Reginald Murray, K1MPN—SEC: W1VSA. RM: W1WFZ. April net reports:

Net	*Freq.*	*Time*	*Days*	*QNI*	*QTC*	*NCS*
Gr. Mt.	3855	2130Z	Dy x Sn	703	63	W1VMC
Vt. Fone	3855	1300Z	Sun.	63	—	W1UCI,
VTNH	3685	2230Z	M-F	64	31	K1UZG
VTCD	3993	1400Z	Sun.	25	2	W1AD

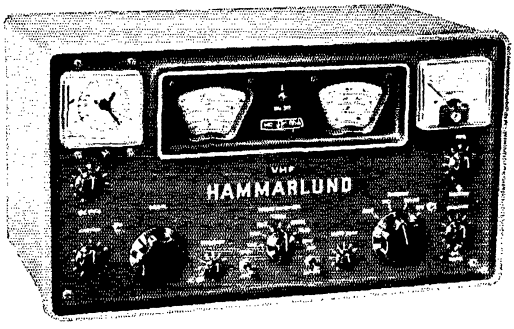
Don't forget the International Field Day on July 4 at Champlain Valley Fairground sponsored by the BARC. We are happy to report that K1WNU is back at work after a session in the hospital. New officers of the Central Vermont Amateur Radio Club are W1FRT, pres.; K1-HDB, vice-pres.; K1NEI, secy.; K1FSY, treas. Congrats to W1FRT on passing the Amateur Extra Exam. 2-meter activity is on the upswing in the Burlington area. An s.s.b. group is congregating around 3890 kc. about 8 P.M. evenings. Traffic: K1BQB 317, K1UZG 50, K1LLJ 19, W1JLF 8, K1MPN 4, K1IJJ 2.

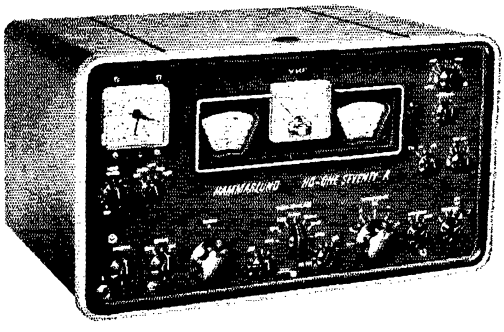
WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR - C.W. RM: K1IJV, W1DWA has a new 20-meter beam. W1QKX passed the Extra Class license exam. Congrats. He has now finished 6-meter kw. Class C. Class B modulated rig and is working on a new kw. h.f. rig. W1EOB worked AC9II for No. 276. Nice going. W1ZPB is looking for 6-meter c.w. skeds. W1MNG is busy on v.h.f. The West. Mass. C.W. Net (WMN nightly on 3560

ARE YOU ABOUT TO BECOME A VHF HAM?

Careful, hams! Smoke can get in your eyes. When you shop for ham band receivers, the toy manufacturers might get you with their chrome, flashing lights and front-panel showmanship.
Hammarlund asks you to kindly step inside.

Inside their complete frequency range sets, where construction is tight as your fist. Where everything is heavy because Hammarlund builds receivers like a rock. Where engineering is exquisite because Superpro engineering goes into every Hammarlund set.





TWO REASONS WHY THEY CALL HAMMARLUND THE BIG (H) in VHF

16-tube, multi-conversion HQ110A-VHF includes 4 nuvistors
20-tube, multi-conversion HQ170A-VHF includes 4 nuvistors

- Full amateur band sweep from 2 to 160 meters.
- Linear detection for superb SSB and CW reception.
- Exclusive Hammarlund auto-response automatically adjusts audio passband to best meet receiving conditions.
- HQ170A-VHF has extensive range of available selectivity curves for optimum performance under adverse conditions.
- HQ110-VHF costs $299.95. HQ170A-VHF costs $419.95.
- Timer clock optional—$10 extra.

HAMMARLUND MANUFACTURING COMPANY
A GIANNINI SCIENTIFIC COMPANY
73-88 HAMMARLUND DRIVE, MARS HILL,
NORTH CAROLINA, 28754.

YES—I want to know more about Hammarlund ham band receivers.

NAME _____
CALL LETTERS _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

HAMMARLUND

SUPERPRO ENGINEERING IN EVERY SET

TOTAL COMMUNICATIONS SINCE 1910: COMMERCIAL, AMATEUR, CONSUMER, INDUSTRIAL COMMUNICATIONS EQUIPMENT / VARIABLE AIR CAPACITORS

at 7 P.M.) handled 134 messages during April with the following stations in attendance (listed in order of activity): K1WZY, K1IJV, W1DVW, W1ZPB, W1BVR, K1LBB, K1SSH, K1YMS, K1ZBN, K1VPN, W1DWA, W1MNG, W1QKX, K1CPG, W1BDV. K1OOV is being transferred from G.E. Ordinance to Syracuse G.W. K1JGW has a new HT-44 transmitter. WA1CPD, W1KVN and W1NWO were heard around 52.45 Mc. on n.f.m. The Berkshire County gang is certainly batting out the ole DX with the top ones being W1UUK 221/237, W1DGT 203 206, W1WF 138/138, W1COU 128/137, K1JGW 120/128 (the latter on s.s.b.). RM K1IJV took over for W1BVR at the West. Mass. Section meeting at Swampscott. At the April meeting of the Hampden County Radio Association approximately $700 worth of gear was sold. K1RPB has just returned from Tehran, Iran, Where he operated EP1RPB. The Valley Amateur Radio Club of Springfield is extremely active with about 70 present at recent meetings. K1TKL passed his radiotelephone 1st class exam. Congrats. Traffic: K1IJV 110, W1BVR 102, K1SSH 67, K1LBB 33, K1YMS 26, W1DVW 20, W1DWA 15, K1WZY 15, W1ZPB 7, W1QKX 5, W1EOB 3.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Daniel R. Wright, KL7ENT—Your SCM has been conducting classes for General Class aspirants. Our recent disaster experience has upped the communications interest of many, and our present class includes many identified with the Providence Hospital and Fire Departments. The Novice Amateur Radio Club is reported by KL7DG, to have 27 attending in the 14th week of classes. It was KL7DG who intercepted a call for help from a Russian ship in the news the other day—reporting same to the Coast Guard (Kodiak). The SCM will welcome reports for these columns from Fairbanks, Anchorage, and all other Alaskan points, also applications for ARRL posts and traffic reports.

IDAHO—SCM, Raymond V. Evans, K7HLR—PAM: W7GGV. The RACES C.D. Drill Bravo seemed to show improvement in some areas over the Alpha Drill. Some districts still are without direct contact with the State Headquarters, so some c.w. operators are badly needed. Don't forget to include in your summer plans the W1MU Hamfest the first week end in August. Those interested in the Navy MARS program should contact K7MNZ, in Aberdeen. FARM Net: 22 sessions, 646 QNI, 73 QTC. Traffic: W7GMC 41, W7GGV 26, K7OAB 10.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—Asst. SCM: Harry Roylance, W7RZY. SEC: W7KUH. PAM: W7YHS.

Montana S.S.B. Net	3910 kc.	M-F	1800 MST
Montana PON	3885 kc.	Sun.	0900 MST
Montana RACES	3996.5 kc.	Sun.	0900 MST
Montana State Net	3520 kc.	S-Tue.-Thur.	0900 MST
Missoula Area Emergency Net	3890 kc.	Sun.	0900 MST
Butte-Anaconda Two 144.450 Mc. Meter Emergency Net		Wed.	1900 MST

K7WUF sends us word that K7DYD, W7EKB, K7HJM, K7SMT and K7WUF are handling traffic from Culbertson Hall, Montana State College. W7ZHA had an average error of 10 parts per million, W7NPV an error of less than 9.5 p.p.m. and W7FIS an error of less than 8.0 p.p.m. in a recent ARRL FMT. Activity reports were received from W7FIS, W7EWZ, K7YEM and K7WUF. WN7ARA passed the Conditional Class exam. WN7CJG is a new call in the Billings area. K7EWZ will be off the air for a few months while Ross does some work on his home. W7RZY advises that the Old Faithful Radio Club will hold its annual picnic July 11 at the Battle Ridge Camp Ground. W7OIO sends us word of the RACES setup in Butte. K7ASV, W7QCY, W7CJN and W7FLB were a few in Spokane for the recent FCC exams. K7OEK has a new HW-12 on the air mobile. W7VNE has a new 2-meter transceiver on the air. W7CJN has a new 6-meter transistorized transceiver on the air and his first QSO was with W7TQC in Anaconda. We remind the gang of the Waterton Lakes Hamfest July 17 and 18 at Waterton, Alberta. Traffic: K7SVR 42, K7YEM 39, K7EWZ 25, K7ZIX 15, K7UPH 8, W7FIS 5.

OREGON—SCM, Everett H. France, W7AJN—RM: W7ZFH. New appointments: W7GWT as OES, W7UQI and W7DEM as OBSs for 2 meters and 75 meters, respectively. Net reports: Oregon State Net, 3585 kc. 0130 GMT Mon. through Fri. K7IFG, net manager, reports sessions 22; attendance 92, high 9; traffic 42, high 8; average 1.9; BRAT awards to W7ZFH and K7IFG. Oregon AREC Net, 3875 kc., 7 P.M. daily. W7AZD, net manager, reports 14 counties maximum, 21 check-ins per session maximum, total 348, traffic 16. 3 QSTs, 38 contacts, 24 sessions. NCSs K7REV 3, K7TDO 2, K7PHP 2, K7IGD 3, K7AXF 3, K7CNZ 1, W7NJN 4, W7JUP 2, W7DEM 2, W7JP 1, W7AZD 1. The Multnomah County AREC and

NOW—FOR THE FIRST TIME!

Single Sideband Equipment

FCC TYPE ACCEPTED FOR MARITIME MOBILE AND LIMITED SHORE STATION SERVICE

Model SB-6FB, SSB Transceiver

RF Communications is pleased to offer the first type accepted SSB communications equipment for marine applications.

Qualified applicants are eligible to apply for frequency assignments for private ship-to-ship and ship-to-shore channels in the high seas radio-telephone bands.

The SB-6FB is type accepted for use in the 4, 8, 12 and 16 Mc service as well as 2182 Kc AM applications.

NOW AVAILABLE FROM STOCK

Contact us for further details and the name of your nearest R F Communications dealer.

rf

R F COMMUNICATIONS, INC.

1680 UNIVERSITY AVENUE • ROCHESTER, NEW YORK 14610

Portland Amateur Radio Club held a joint meeting at the Red Cross Building. Guest speakers were Dave Bauman, Supervisor of the Portland River District of the U.S. Weather Bureau, who showed pictures and gave information on the December floods; and Francis H. McCann, W7AJQ, of the Portland FCC Office, who explained the proposals now being made by FCC. Coffee and doughnuts were served by the Red Cross at the close of the meeting. W7GWT says that there are 200 2-meter stations active within 25 miles of Portland. WA7ADW and K7VAIV, of Grants Pass, have 75-meter s.s.b. mobile. K7YNO now is using 75-meter mobile. Traffic: K7IFG 354, K7IWD 266, W7ZB 203, K7WPC 73, W7JHA 62, W7ZFH 51, W7DEM 11, W7AJN 8.

WASHINGTON—SCM, Everett E. Young, W7HMQ—SEC: W7HMQ. RM: W7AIB. PAM: W7LFA. V.H.F. PAM: W7PGY. W7PGY, Northwestern Division Director requests that all clubs forward their mailing address with date, time and place of meetings.

NTS	WSN	0200Z	Daily QNI 276 QTC 192	3535 kc.
	WARTS	0130Z	Daily ex. Sun. No report	3970 kc.
Noon Time Net QNI 1110 QTC 819 30 stations daily				3970 kc.
N.W. Slow Speed QNI 216 QTC 66 0400Z daily				3700 kc.
N.W.S.B.		No report		
C.B.N.		No report		

Mt. Baker ARC was too busy hunting rabbits to give much news. K7IAE now signs /4 from Alabama. RM W7AIB reports QNI normal, but traffic down some. OO-ORS W7OEB reports that K7QOM was captain of FD and K7RSM visited the Benton Co. gang. W7AOQ is training wires for a new rig. K7ZRF takes Richland traffic. K7VNV is fighting TVI on 50 Mc. W7GHP is now s.s.b. from Oregon. Basin ARC (Moses Lake) heard FD with a new call, WA7CYA/7. ORS/OBS, W7AMC is tossing out s.b. and going half-gallon a.m. EC W7AJV, Klickitat County, says 3 out of 6 are signed up for AREC. OBS K7CHH is building 50-Mc. solid state v.f.o. OO W7UVR is QRX 6 months for Selsyn. W7BTB waited 34 years to make the BPL. WA7BMA is active with 75 watts and had a real workout during the 'quake. W7OEB is having "Ranger" trouble. W7BTB gets results to his interference problem by going to the start of it. A nice letter from W6ETO should clear it. WN7BQV now is active from McCleary with a T-60 and an NC-125. The Puget Sound Council of ARCs is planning its 4th Annual Banquet for September. Watch for information on date and place. K7DOB has all home-brew s.b. gear. W7SLB on s.s.b.? K7CHV now operates KC6SP from Western Carolines, 15 and 20 Mc. EC W7UWT, Kitsap County, sends in his 102nd report, consecutive over 8½ years. W7MCU is sporting new 2-meter f.m. gear with a tuney antenna stop the New-Yorker. W7DNU edits VARC News. W7EJD is setting up boundaries breaking down-King County for TVI and AREC use. K7JBZ attends Western Washington Interference Committee meetings and is very happy with comments on amateur cooperation. Participating hams in the Western Washington Daffodil Parade were K7NZR, K7KOT, K2SBV/7, W7DNU, W7-WHV, W7SLB, K7DOB, W7JJK, K7VCX, K7KVS, WN7-AUS, W7OIV, W7HMQ, W7MCU, W7PGY, N.W. Director has a good show on the new ARRL building and the gang at Headquarters. Contact him for booking. His address is on page 8. Traffic: W7BA 1011, K7JHA 959, W7DZX 779, W7NPK 465, K7TCY 443, K7CTP 333, W7APS 223, W7BTB 190, K7URU 86, K7ZPM 42, W7JEY 31, W7GYF 26, W7AMC 24, W7OEB 24, W7AIB 21, W7-HMQ 21, K7IAE 21, W7JC 11, W7EVW 10, K7YVC 5.

PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN—SEC: WA6OLF. WA6WNG made WAS, WB6ETY has full break-in system going. WB6LLI made 37K in his first CD Party. WA6QZA and WA6PTU have a new Swan 5. WA6PTU reports through the Oakland Red Cross that they are relaying messages for the patients and personnel at Oakland Naval hospital. W6CBF participated in the Phone CD Party and has a new 40-80 antenna. Vice-Director W6ZF reports the new operating console is nearly finished after four years of work and he will be going back to traffic soon. W6ZF, WA6UFW, K6AMA, WA6OLF, WA6-WNG, WB6IHZ, K6MHD, WA6AHF, WA6KLL, W6TYM, WA6MIE, W6LGW and XYL, WB6IBU and K6LRN were among those present at the Director's meeting May 1 at the Edgewater Inn. I wish everyone could read the April *Lark*. WA6KLL's account of their efforts on Oscar III is a classic. WB6GUG is the call of the Silverado ARS. New calls in the SARS are WN6OVW, WN6OBR and WN6OUT, Fairfield. It appears from the various club papers that Docket #15298 has stirred up a hornet's nest. I hope you all get your comments in on this by July 15. W6UGO was chosen 1964 Castro Valley Kiwanian of the year. WN6-OEQ and WN6OKQ are new calls in the HRC. W6NVS is secy. of the HRC, replacing WA6JCS. Let's all support the NCEF plan by monitoring when in the shack but not

a KW ssb station

only 64½ cents per watt

The brilliant new **SB-34,** SSB 4-band transceiver serves as your receiver and exciter... the new matching **SB2-LA** Linear furnishes the big bang! This advanced design power combo costs you only 644.50, unquestionably the lowest cost per watt obtainable! But this is only part of the value story. **SB-34** has a **built-in power supply,** 117V AC **and 12V DC**... needs no separate inverter... connects directly to the 12V car battery when you want the added pleasure of 4-band mobile transceiver operation. **There's just no comparable value!**

SB2-LA LINEAR AMPLIFIER . . 249.50

Husky, heavy-duty, with 1KW P.E.P. input capability on 80-40-20-meters, 750 watts on 15 meters, this exceptionally compact amplifier matches SB-34 in general size and appearance. Operates perfectly with SB-34 but can boost the output of any SSB exciter to a full KW. AC power supply is built-in.

4-bands, 80, 40, 20, 15 meters • Full band switching • Passive grid input for resistive load to exciter. Drive: 60W or more depending upon the linear amplifier power output • **Low plate voltage** (800 volts) and high plate current • Easier on capacitors, rectifiers, power transformers • Safer under environmental extremes • **High filter capacity** for dynamic regulation • **Built-in antenna relays** (2), **internal blocking bias • HI/LO power and TUNE/OPERATE switches • Panel meters for output and plate current • Six parallel-connected 6JE6's are used in amplifier • 115V AC power supply (built-in) is all-solid-state. Size:** 5¼"H, 11¾"W, 11⅝"D. Wgt, 35 lbs. (apprx).

SB-34 TRANSCEIVER 395.00

New . . . advanced . . . with important plus performance features! Transistors and diodes replace vacuum tubes (except for the 2-6GB5's in PA and 12DQ7 in RF driver) — equipment size is reduced greatly — current drain lowered substantially. Example: **SB-34 draws only 500 ma on receive standby.**

Built-in supply for 12V DC and 117V AC • Power input: 135 watts P.E.P. (Slightly lower on 15 meters) • **Frequency range:** 3775-4025 kc, 7050-7300 kc, 14.1-14.35 mc, 21.2-21.45 mc • 23-transistors, 18-diodes, 1-zener, 1-varactor, 2-6GB5's PA, 1-12DQ7 driver • **No relays — solid state switching — breakthrough! USB or LSB selectable by panel switch • Collins mechanical filter — transmit/receive • Delta receiver tuning • Solid-state dial corrector • prewired for VOX/100kc calibrator accessories** — both units are optionally available. **Single-knob dual-speed tuning. Size:** 5"H, 11¼"W, 10"D. **Weight** 20 lbs. (Approx).

SIDEBAND SBE ENGINEERS

317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIF.

RAYTHEON **Export sales:** Raytheon Company, International Sales & Services, Lexington 73, Mass, U.S.A.

operating. The only way for a program to succeed is for each one of us to get behind it and push for all we are worth. Part 97 of the rules and regs call for the expansion of the existing reservoir of *trained* operators, *technicians* and electronic *experts*. Yes, the FCC expects us to be experts. The dictionary defines an expert as a person who knows a great deal about something; very skillful. If you don't think an amateur should be an expert and know about radio you are mistaken because that is all that separates us from the citizen's radio service. Just because hobby is defined as (1) something a person likes to work at or study apart from his main business or (2) a favorite occupation or topic pursued for amusement, does not excuse us from observing the rules. It should spur us to do more and do it better because it is something we especially like and want to see continued and improved. WA6OLF QNIs the Bay Area RTTY Net at 7 P.M. local time on 146.7 Mc. Traffic: (Apr.) K6TFT 351, WA6WNG 154, WA6NFF 93, WA6OLF 60, K6LRN 52, WA6PTU 16, W6ZF 10, WA6QZA 9, WB6ETY 7, WB6ILH 6. (Mar.) K6TFT 218, WA6NFF 51.

HAWAII—SCM, Lee R. Wicat, KH6BZF—Asst. SCM/SEC: Ernie J. Kurlansky, KH6QCL. PAM: KH6ATS. RM: KH6EWD. V.H.F. PAM: KH6ECT. Mark your calendars for the Hawaii State Convention July 17, 18 at Hilton's Hawaiian Village. Recently those associated with ARMY MARS Hawaii attended their annual installation banquet at which Acting National Director of MARS, Ed Liscombe, was the guest speaker. KH6FMD has been working a lot of aeronautical mobile while flying between Hawaii and the Far East. K2GHS/KH6 has enjoyed our fair state while he has been attending our "East-West Center" at the U. of H. W8NTZ/VO2 is on 20 meters with his new SP-400, 2B and quad looking for KH6 contacts from his Goose Bay AFB QTH. KH6ATS has returned from a trip to the island of Kauai where he eyeballed with KH6ECT. W4EXM/KH6 is thinking about returning to the Washington, D.C., area at the end of this fiscal year. W3CHH/KH6 has just returned from the Saigon-Chlon, RVN area. KH6FBA has returned from business on Kauai. KH6ATS reports that the Friendly Net on 7290 kc. at 2100 Daily had 112 check-ins in April. KH6APJ reports his OBS is involved in Oscar III work. KH6IJ spoke at a recent meeting of the HARC. The S.S.B. Club met recently at the Pagoda Hotel. The Maui ARC is getting up steam for the coming summer radio events. KH6FOW and KH6GG were behind the recent National Emergency Test. Traffic: (Apr.) KH6ATS 16, W4EXM/KH6 1. (Mar.) KH6BZF 8, KH6ATS 7.

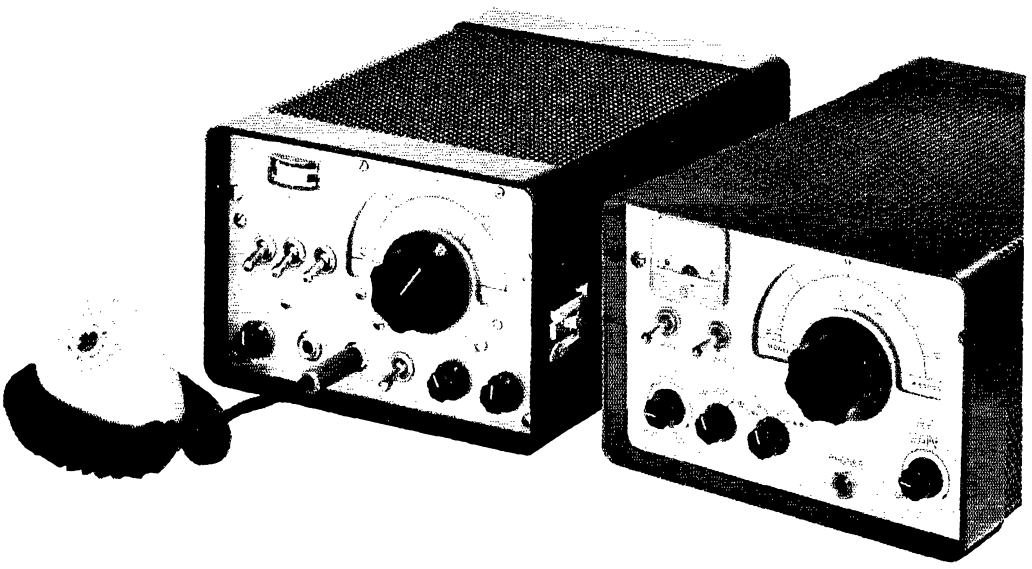
NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: W7JU/K7JU. The SNARC issued its certificate No. 88 to W7ULC. K7NVB has a 90-ft antenna pole with a three-element beam and reports good DX. K7RKH and K7NYU have been working portable 7 from Utah on 6, 2 and 1¼ meters with good results. W4CJD/7 and family vacationed in Arizona. K4FUM/7 and W5ILL/7 have a code theory class for amateurs in Tonopah. W7THH is out of the hospital and doing fine. K7CMI has an XYL instead of a YL. W7AZF has a new son: W7ZHW a new grandson. W7ASU is rebuilding a TCS. W8GAY/7 is interested in handling traffic for the Las Vegas area. W5BNJ/7 is new in Las Vegas. W7PRM has a Model 15 TT. WA7BAV reports good DX; his father, W5IXQ, was a visitor for a few days. K7UXA is running an s.s.b. Viking rig. K7ZOK, on 2- and 6-meter s.s.b., reports band openings to Texas and Washington using 11 elements on 2 and has 44 elements on 430 Mc. Traffic: WA7BAV 80, W4CJD/7 60, W7JU/K7JU 8, W7PBV 4.

SACRAMENTO VALLEY—SCM, John F. Minke, III, WA6JDT—Welcome to W6SMU as EC for Sacramento County. The following have passed the Extra Class exam: W6GDO, WA6DBL, WA6TXH, WA6SLU and K6YZJ. The Calif. C.D. Net (CCDN) now has an s.s.b. net at 0330Z Tue. on 3987.5 kc. WA6SLU represented this section in the April CD Party (c.w.) with 191 contacts. WA6JDT managed to get on the phone portion with only one contact. Our section ranks quite low in CD contest participation. The Sacramento Co. Emergency Net held a transmitter hunt Apr. 4 with WB6KCH as NCS. Hidden transmitters were operated by WB6DQO and WB6BWB. Nevada County ARC is now affiliated with ARRL. The Sacardep RC (W6SIG) has voted to apply for affiliation. WB6EAG, of Woodland, has been active as an NCS in the San Joaquin Net. Ed will be moving soon to Ft. Jones in Siskiyou Co. How about a Sacramento Valley section net? Interested persons should write to your SCM or send a radiogram! New hams: WN6OII of Woodland, WB6PHP and the RAMS coffee girl, WB6PHQ. W6CQA has installed a fifteen-element 2-meter beam and an 80-ft. tower. February FMT participants were K6ALH, W6GDO and W6ZJW. WA6YQS is a new OO. W6MIW, WA6HYU and WA6JDT attended the Pacific Division Director's meeting in Oakland. W6GDO made good use of Oscar III by working the East Coast. Your SCM is now on 80-meter RTTY. Traffic: (Apr.) K6YBV 168, W6CMA 39, WB6MAE 38. (Mar.) W6CMA 17.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—SEC W6KZF reports that not enough reports are being

DESIGNED FOR THE AMATEUR WHO IS

ACTIVE ON SIX



COMPLETE, SELF-CONTAINED STATION FOR FIXED, PORTABLE, OR MOBILE OPERATION.

LI'L LULU TRANSMITTER FOR 6

Special gang-tuned circuits in Li'l Lulu let you QSY instantly — there's no buffer tuning and final dipping needed when the frequency is changed. And the rig is really TVI proof! By keeping the VFO grid circuit in the 25mc range, TVI is eliminated.

• 117 vac, 12 vdc integral power supply. Class A high level modulation. Carbon dynamic or crystal mic input. Push-to-talk, or use panel switch • Built-in cw keying filter • VFO spotting switch • VFO control • 12 DQ7 final.

LI'L LULU RECEIVER FOR 6

Specially developed to complement the famous Li'l Lulu one-knob-controlled transmitter for 6 meters, the new Li'l Lulu receiver is unmatched for performance.

• AM, CW, SSB • Product detector for SSB • BFO crystal controlled • Delayed AGC operates on AM, CW, SSB • Integral front-end filter • Tunes 50-54 mc, and 10 mc for WWV and converter input • Critical components are temperature compensated • 10 mc crystal filter ahead of 3 IF amplifiers • Built-in CW monitor • ANL operates in all modes • S meter controlled by non-delayed AVC • Front panel control for companion transmitter — 80 to 1 drive reduction for precise tuning • Matches the Li'l Lulu transmitter.

WHIPPANY LABORATORIES, INC.

1275 BLOOMFIELD AVENUE, WEST CALDWELL, N. J.

received from his ECs. W6GQA worked three Headquarters gang in the C.W. CD Party. New appointments are WA6STS. WB6CKT and W6ARQ as OESs; K6TZN as OPS. New officers of the Sonoma County Radio Amateurs Club are W6BCC, pres.; K6ALI, vice-pres.; W6ARQ, secy.-treas.; WB6EAS and WA6SFB, directors. K6EKC has moved to Santa Rosa and is trying to get back on the air. WA6IVM is in his remodeled shack and also continues as TVI chairman of the San Francisco Radio Club. WA6TGY is coordinating the DX functions at the ARRL National Convention in San Jose. W6RMM is looking for a few more cards to finish his list for DXCC. WB6GVI is building a ground plane for 10-15-20. K6JFY has changed his QTH and hopes to be active by this time. WA6STS has finished transverters for 2 and 6 meters and a 416B converter for 432 Mc. WA6GQC is home from the hospital after major surgery. W6BIP has been active again with the higher frequencies opening in the evenings. K6TZN has moved to a higher QTH after the winter floods on the Eel River. WA6ALK is looking for s.s.b. contacts on 144 Mc. Estelle worked 7 and G-Land during openings in April. W6GQA scored a remarkable 1.8 parts per million in the February FMT to lead the OOs in the section. W6UDL still is working irregular hours but has been checking into the traffic nets. A good many Public Service Awards were awarded to the stations who were active in the December Flood emergency. WA6NDZ is building a new RTTY Terminal Unit. Six-meter f.m. is getting a big play in the Santa Rosa area. W6ARQ has finished his 417A converter and is hearing a lot of new stations. WA6ROJ is building a new operating table but vacation slowed things up. Traffic: WB6GLD 25, W6UDL 19, WA6AUD 15, WB6GVI 15, W6BIP 8, WB6HZZ 6, WA6IVM 5, W6CYO 3. WA6ALK 2.

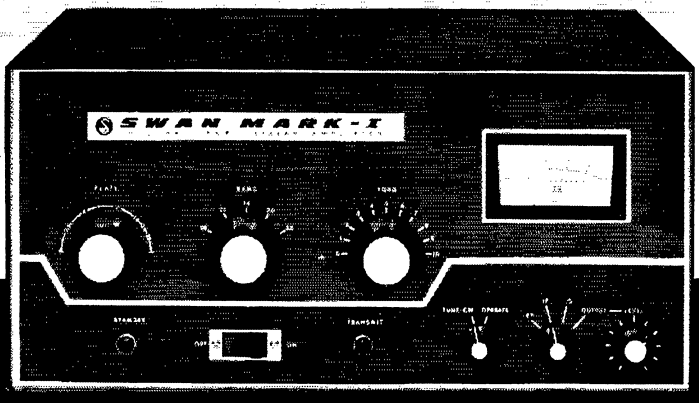
SAN JOAQUIN VALLEY—SCM, Ralph Sarovan, W6JPU—W6PXP is recuperating from an illness and is doing well. W6JCB suffered a heart attack, and is getting back on the air after a long silence. WB6HVA and W6JCB are using the same poles for their dipoles with the antennas stretched between the houses, 40 meters for W6JCB and 80 meters for WB6HVA. W6DAZ was heard on 75-meter s.s.b. K6SEV has an HW-12. 7Q7GN is now located in Fresno and should be on the air with his HW-32 and quad. W6QOS is building an s.s.b. exciter using a 9-Mc. filter. The Turlock Amateur Radio Club is going to Hatfield Park, on the Merced River, for FD. K6BGK has a new pick-up with the Gonset Twins installed. The new officers of the Kern County Radio Club are Ex-K6APE, pres.; WA6MAV, vice-pres.; K6QXB, secy.; WA6YAP, treas. K6CKL is on 2-meters a.m. with a kw. K6JAG and WB6GDO have Drake 2-B receivers. WA6QEJ has a TR-3 and is in McFarland. W6LIE (Kern Co. Radio Club) is going s.s.b. WB6CML is on 2 meters and wants to go s.s.b. The Kern County Radio Club meets the 2nd and 4th Fri. of each month at Bakersfield Police Dept. at 8 P.M. All are invited. The April meeting of the Delta Amateur Radio Club featured transistorized equipment with WA6EWP, WA6LSA, WA6KEJ. WA6FBL and K6GZN participating. K6MPM has a Galaxie mobile on 75-meter s.s.b. WA6TZN passed his Extra Class test. Traffic: W6ADB 122, WB6HVA 111. K6MPM 30.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM, Ed. Turner, W6NVO. SEC: WA6HVN. RM: W6QMO. V.H.F. PAM: WA6RRH. The Santa Clara Valley Section Net reports 22 sessions, 118 check-ins and 69 traffic. WA6RRH reports that the net really is picking up and is being helped by AF MARS and the Bay Area RTTY Net, which meets at 7 P.M. on 146.7 Mc. just before SCVSN. Net certificates were issued to W6TYB, WA6RXB and W6UVP. W6AGR now reports he is able to copy traffic on the mill, which he says is a "major breakthrough." W6JNK reports that antenna troubles as a result of high winds in his area are causing some problems. W6YBV is busy on NCN, RN6 and PAN. W6QMO attended the Pacific Division Director's Meeting. W6HC is busy on TCC. W6DEF is putting up a new antenna. W6PLS is active in QCWA and also was active in handling traffic in the Seattle area 'quake. W6ZRJ works DX on 20-meter c.w. WA6RXB is back in operation after a business trip East and works SCVSN. WA6JSA now has his autostart working on RTTY. W6OII tried to work in the Phone CD Party with no results. W6RFF is building an electronic keyer. K6EQE works MTN. K6PJW works the San Mateo AREC Net. K6MTX is busy with the Navy MARS RTTY circuit. K6YKG is trying for 20 w.p.m. on the mill. W6IBW works the SPECS Net. WB6IZF reports from the King City area on 2-meter activity including much fine propagation information. W6AUC works the Sketo Net and is OO. Traffic: W6RSY 947, W6AGR 257, W6JNK 249, W6YBV 164, W6QMO 144, W6HC 93, W6DEF 89, W6PLS 70, W6ZRJ 36, WA6RXB 25, WA6JSA 19, K6AUC 15, W6OII 12, W6RFF 6, K6EQE 2.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4BNU—Asst. SCM: Robert B. Corns, W4FDV. SEC:

2000 Watts?
Two 3-400Z Triodes?
Less than $500?



See the NEW *SWAN MARK I*
Linear Amplifier

- Two 3-400Z Triodes in grounded grid circuit.
- 2000 watts PEP input.
- 1000 watts CW and tune.
- Drive requirements: 100 watts.
- Built-in changeover relay.
- Built-in 117/220VAC power supply.
- Wide range pi output.
- Dimensions: 19" x 8½" x 15½"

with the usual SWAN reliability and performance.

Price $425 less tubes.
68 Mfgr. suggested tube price.
Total $493 incl. tubes.

SEE IT AT YOUR SWAN DEALER!

SWAN ELECTRONICS CORP.
Oceanside, California

W4MFK, RM; WA4FJM, PAM; W4AJT, V.H.F. PAM; W4HJZ, WA4PDS says Wayne County ARA participated in Armed Forces Day activities at Seymour Johnson AFB. K4HZP says he finally has an antenna for 3573 kc. and enjoys checking into NCN. K4TTN reports having a ball in his first CD Party. WA4ICU says WA4-KFH is now on 6 as well as 2 meters. W4IYM is now on 2 meters. K4EO reports K4VHO and XYL K4FOZ are receiving congratulations on the addition of a jr. operator. W4CGO has started a local ARPSC net for Onslow and Carteret Counties. WA4ANH reports that activity is picking up on NCN(L) with several new stations checking in regularly. W4YMI reports that AREC was not usable after the recent tornado in his area and he had to use RACES. K4CVJ has a new mobile with a KWM-2 and a Spitfire linear amplifier. W4HJZ says he now has SB-400 going on the "D.C." bands, with a 5-band inverted "V" antenna.

Net	*Freq.*	*Time*	*Days*	*QTC*	*Mgr.*
NCN(E)	3573 kc.	2330Z	Daily	503	K4CDZ
NCN(L)	3573 kc.	0300Z	Daily	204	WA4ANH
NCSSBN	3938 kc.	0030Z	Daily	142	WA4LWE
THEN	3865 kc.	0030Z	Daily	61	K4WLV

Traffic: K8NPT/4 838, W4BDU 160, W4IRE 146, W4EVN 135, WA4ICU 134, W4LWZ 111, W4UWS 103, K4CDZ 65, K4IEX/4 61, W4CGO 47, K4CWZ 47, WA4ANH 45, K4TTN 40, WA4FJM 36, WA4LWE 34, K4EO 29, K4-GNX 24, W4YMI 24, W4OTE 21, WA4VTV 19, W4FDV 16, W4BNU 15, K4HZP 15, K4CVJ 4, W4ACY 2.

SOUTH CAROLINA—SCM, Charles N. Wright, W4-PED—SEC: WA4ECJ. RM: WA4PFQ. PAM: K4WQA (s.s.b.) K4OCU (a.m.)

Net	*Freq.*	*Time*	*Sess.*	*QTC*	*QNI*
SCN	3795 kc.	Daily 0000Z and 0300Z	62	119	--
SCEN	3820 kc.	Daily 0030Z; Sun. 1130Z/2030Z	25	12	206
SCSB	3915 kc.	M-F 0100Z; Sat., Sun. 0000Z	30	212	1279

WA4ECJ and WA4EFP were honored as Sidebands of the Year for "wholehearted devotion to amateur radio . . . helping others forgetting personal sorrow and trial in order to serve fellow hams . . . friendliness to all . . . technical knowledge and willingness to share this knowledge." The state Radio Council has adopted as a project a program which will provide both code and theory instruction on the 10-meter band from a number of locations throughout the state. Not only will this aid hams who wish to upgrade their licenses but it will enable interested CBers to listen on their existing equipment with little modification. Traffic: K4LND 116, W4AKC 95, K4LNJ 84, WA4OWY 55, W4PED 34, K4OCU 32, WA4QKQ 31, W4NTO 22, WA4LPV 7.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—W4OKN now is using a 32V-3 to drive the PL175 at about 500 watts. K4BAV was able to get on a little during the spring vacation despite transmitter and antenna problems. K4NCP now has a full gallon and a new NCX-5. WA4EUL burns the midnight oil planning the c.w. traffic sessions for the Roanoke Hamfest. There have been many comments about the new FCC proposals. W4NTR was busy with Santo Domingo evacuation traffic. He now is using a brand-new S/Line with a 30S1. WA4UXL now is an NCS on the late VSBN and also a new 4RN representative. WA4SGD worked his 1st DX—E19J plus KC4USP. K4GRZ is the new AREA 10 EC. W4KFC worked CEØXA for a new country and enjoyed a visit from W1JYH. W4JUJ needs one more canton for All Cantons in Switzerland; his newest award is the s-YL-ver DOLL-ar. Hi. WA4REU completed his emergency power supply and now is working on the AREC mobile rig. WA5FCS has his a.m./c.w. rig back in operation with 300 watts and has complete switching installation for fingertip control. K4SCL made a trip from Charleston, S.C. to Norfolk, Va., on a Sea Scout ship, the *Sea Explorer*, for which he furnished the communications. The Inland Coastal Waterway was used. W4DVT thought he really was going to set the world on fire in the April CD Party with his new SB-200. Oh well, wait until October! The new pres. of the Va. Tech Amateur Radio Assn. is WA4IVM. We plan a greatly stepped-up OO program for Virginia. Watch the *Virginia Ham* for details. Traffic: W4NTR 390, W4-DVT 308, WA4EUL 245, WA4UXL 212, W4RHA 184, W4NLC 180, K4GRZ 162, K4SCL 155, W4MXU 151, K4-LJK 127, WA4AYP 118, W4SHJ 107, W4OKN 106, K4-YCH 105, WA4DAI 93, WA4EDG 84, WA4FCS 65, K4-NCP 55, WA4JXO 50, K4MXF 42, K4FSS 41, K4VCY 40, K4ASU 36, W4PTR 31, WA4EHM 22, K4SDS 21, WA4-JGA 16, K4LMB 16, K4KX 14, W4OWE 14, W4ZAU 13, W4MK 11, K4PIK 11, WA4KVR 8, W4TE 7, K4NOV 6, WA4REU 6, W4QDY 4, W4ZMT 4, K4BAV 2, WA4HBC 2, WA4IVM 2, W4KFC 2, WA4SGD 1, W4YZC 1.

SIX BANDS IN TWO MINUTES!

This is the performance that K4KXR of Gotham can demonstrate, using his Gotham V-80 antenna with 35 foot feed-line connected to the coil at the antenna's base, and his HT-40 transmitter. Neither the antenna nor the coil is touched. Without worrying about the standing wave ratio on various bands, Bob merely switches his rig to the desired band (80-40-20-15-10-6 meters), plugs in the crystal, tunes grid drive, plate tuning and plate loading, and he is on the air. No TVI at any time even with TV receiver in the same room. Contacts vary from local ragchews to DX thousands of miles away.

GOTHAM VERTICALS DELIVER THE CONTACTS

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71
"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when I bought it." D. S., New Jersey.

CASE HISTORY #613
"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #146
"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555
"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84
"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

ALSO AVAILABLE AT
AIREX RADIO CORP, NEW YORK CITY
GRAHAM RADIO, READING, MASS.
EDWARDS RADIO, PROVIDENCE, R.I.
BROSCH ELECTRONICS, WEST GERMANY
VAREDUC-COMIMEX, PARIS, FRANCE
VICTORY ELECTRONICS. ODENSE, DENMARK
CAM GARD STORES, CANADA

AN ANTENNA THAT SURVIVES THE COMPETITIVE STRUGGLE CONTINUES TO BE ADVERTISED.

WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA FOR YOU

- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73
GOTHAM

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS. REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED, IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money order for

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS..... $14.95

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City..... Zone..... State.....

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. PAM: K8CHW. RM: W8LMF. S.S.B. Net Mgr.: W8EEQ. WVN Nets meet on 3570, 3890, 3903 and 3905 kc. My sincere thanks to the amateurs of West Virginia and surrounding states for another successful ARRL State Radio Convention at Jackson's Mill. Kanawha ARC now has one leg on a beautiful trophy for winning the '64 Field Day contest. The following stations are on 29.6-Mc. F.M.: WA8AKU, WA8ART, K8BCJ, WA8CPY, W8FDA, W8DYB, WA8FCZ, W8IYD, K8HQS, K8MHR, K8VQG, W8YFX, W8ZHH, WVN (c.w.) Net, 23 sessions, 129 stations, 142 messages; WVN (phone), 22 sessions, 418 stations, 81 messages; WVPON (c.w.), 21 sessions, 115 stations, 231 messages; WVPON (phone), 4 sessions, 75 stations, 13 messages; SSB Net, 21 sessions, 316 stations, 10 messages. WA8GGI is mgr. of the Slow-Speed Training Net, on 3570 kc. at 2330. K8UHC and WA8JWM are active in amateur TV. WA8IMY is active in Forest Fire work around Morgantown. WA8MRK, NCS of the WVN Phone Net, has a new mobile rig for county-chasing. Grafton ARC reports the "Mother's Day Contest" kept club members busy dishing out contacts. Don't forget the Black Diamond ARC Ham-Picnic, Aug. 29. Bluefield City Park, Traffic: WA8FIC 329, WA8IMY 200, K8WWW 71, W8HZA 34, W8CKX 33, K8KST 23, K8CHW 18, WA8MRK 9, K8TPF 7, WA8KGU 4, W8VOI 3, WA8ALI 2, K8ZPN 2, WA8CUZ 1, W8JM 1, W8RXN 1, K8SDH 1, W8VYI 1, K8ZDY 1.

WEST VIRGINIA QSO PARTY

July 24-26

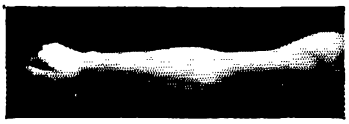
All amateurs are invited to participate in the annual West Virginia QSO Party, sponsored by the Kanawha Radio Club of Charleston, West Virginia. The contest starts 0001 GMT July 24 and ends 0500 GMT July 26. Use all bands, all modes. Each station may be worked twice on each band, once by phone and once by c. w. Complete exchanges consists of QSO number, reports and West Virginia County (or ARRL Section/Country for non-West Virginians). Each completed exchange counts one point. Non-West Virginia stations will try to work as many West Virginia stations as possible. West Virginia stations are not permitted to work stations in their own state for point credit. Suggested frequencies: 3570 3890 3903 7050 7205 14,050 14,300 21,050 21,410, 28,050 28,800 and 50,250 kcs. In scoring, non-West Virginia stations multiply total points by the number of West Virginia counties worked. West Virginia stations multiply total points by number of ARRL Sections/Countries worked. Certificates will go to the highest scoring phone and c.w. stations in West Virginia and in each ARRL Section/Country. Multioperator stations are not eligible. Logs showing usual information in GMT, plus applicants ARRL Section/Country should be mailed to Carl R. Nelson, K8BIT, 4620 Kanawha Avenue S.W., South Charleston, West Virginia 25309. To be eligible logs must be postmarked no later than September 1, 1965.

ROCKY MOUNTAIN DIVISION

NEW MEXICO—SCM, Newell Frank Greene, K5IQL—Asst. SCM: Kenneth D. Mills, W5WZK. SEC: K5QIN. The Roadrunner Traffic Net meets Mon. through Fri. at 1930 MST on 3838 kc. This net got off to a flying start. Around 40 stations have joined the net, with nightly QNI ranging from 15 to 22. S.s.b. is in the majority but any mode that can get on frequency is welcome. The Mesilla Valley Club was host to the White Sands ARC at a Bean Feed. The jr. operator of K5VQU now has the call WA5MRD. We received a large listing of Braille, talking books and tapes to assist the visually handicapped in learning amateur radio. The Albuquerque ARC is preparing a license manual in Braille. Plan to attend the Rocky Mountain Division Convention July 16-18. Traffic: W5WZK 59, W5UBW 46, WA5FFL 34, WA4FLG 30, K5HTT 9.

UTAH—SCM, Marvin C. Zitting, W7MWR/W7OAD—Asst. SCM: Richard E. Carman, W7APY. SEC: W7WKF. Section nets: BUN meets daily on 7272 kc. at 1930Z; UARN each Sat. and Sun. on 3525.5 kc. at 1430Z and on 3987.5 kc. at 1500Z. W7OCX is BUN Net Mgr. W7LQE is UARN Net Mgr. WA7AWF has earned the BUN certificate. K7RAJ is putting out a good signal with an Apache and an SB-10. W7BAJ has his beam up and is working DX with RTTY. WA7ADK got his

Who says it costs



an arm

and a leg to get 22 watts at 450 mc... or 10 watts at 960

We've developed a new UHF power source for you designers of mobile communications gear, low-cost point-to-point microwave links and citizens band. It's simple, efficient and cheap, (yes, cheap). It uses a single Amperex power tube, the 8458, as a driver at 150 Mc., and a single varactor, the Amperex 1N4885 as a tripler. For 960 Mc., one more 1N4885 used as a doubler will provide 10 watts of output power.

The basic specifications of the 1N4885 are: Efficiency 70%, Breakdown Voltage 150 volts, Series Resistance 0.7 ohms and a Capacitance Range of 29 to 39 picofarads. The basic specifications of the 8458 are: Plate Voltage 600 volts, Plate Current 120 mA, Screen Voltage 180 volts and a drive power of approximately 3 watts.

If you can beat the watts per dollar you'll get from this combination of solid state and vacuum tube technology, you've got yourself a swell new job as head of our research and development lab!

For complete information, including an applications report on 8458 driver circuits and 1N4885 frequency-multiplier circuits and filter networks, write: Amperex Electronic Corporation, Semiconductor and Receiving Tube Division, Department 371, Slatersville, Rhode Island 02876.

IN CANADA: PHILIPS ELECTRON DEVICES, 116 VANDERHOOF AVE., TORONTO 17

Amperex®

General Class license and is on the low bands. K7SAI and K7SAJ are mobile with a Pawnee. W7NHY and K7BDX are on 2 meters with a 522. The UARC is running code practice from WA7AKI at the Utah State C.D. Communications Center. Transmissions are on 3525.5 kc., the state RACES Frequency. A schedule of times can be obtained by contacting the UARC. Traffic: (Apr.) W7LQE 141, W7OCX 100, W7VTJ 75, K7EZR 21. (Mar.) W7MWR 8.

WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: W7YWE. RM: K7IAY. PAMs and OBS: W7TZK and K7SLM. Nets: Pony Express, Sun. at 0800; YO, Mon., Wed., Fri. at 1830 on 3610; Jackalope, Mon. through Sat. at 1230 on 3920. Sorry that W7TEL had to resign as EC. A new EC for Natrona County is needed. W7YWE and I held organization meetings in Lander and Jackson in April. We got some very nice cooperation and made the following appointments: W7NKR as EC for Riverton; W7VEW as EC for Lander; W7WCL as EC for Jackson. A couple of new s.s.b. stations on the air are K7TFW, with K7ASB's old rig, and K7QJW, with a nice sounding transceiver. K7ITH was of great assistance in the spring floods in Iowa in relaying for several hours for stations who were unable to copy each other across town because of skip. Traffic: K7SLM 48, K7POX 25, K7TFW 13, W7NKR 10, W7CQP 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Crafts, K4KJD—Asst. SCM/SEC: William C. Gann, W4NML. RM: WA4EXA. PAMs: K4NSU and K4WHW. I enjoyed seeing everyone at the Birminghamfest. We still need qualified stations to apply as Official Observers. School day seems to have been a big success and hope to get the word out earlier next year for this event. W4NML was awarded the Citizenship Award at Birminghamfest. New equipment: WA4GNK-TR3, WA4WLD-DX-40, K4FJZ-250W 6&2 linear, WA4GCS-Henry 2K, WA4OGT-R4, K4DJU-TR3. April net reports, section wide nets (times GMT):

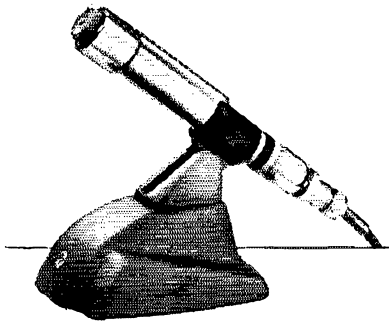
Net	*Freq.*	*Time*	*Days*	*Sess.*	*Ave. Trc.*	*Ave. QNI*
AENB	3575	0100	Daily	30	5.7	7.5
AENM	3965	0030	Daily	30	3.3	42
AENP	3955	1230	Mon.-Sat.	27	2.1	15.7
AENP	3955	2400	Daily	34	1.4	15
AENR	50.55	0115	Wed./Fri.	9	.77	22.66
AENT	3970	2230	Daily	33	1.94	6.23

Lots of stations handling traffic are not reporting to me each month. If you handle any traffic during the month, please report it to me and help us raise our national rating. Traffic: (Apr.) WA4EXA 171, W4NML 138, K4BSK 93, K4WOP 60, W4YNG 56, K4NUW 52, WA4JWS 45, K4KJD 30, K4WHW 28, WA4HFE 26, WA4HKZ 20, WA4FYO 19, K4NSU 15, K4ANB 11, WA4FJF 9, WA4MGI 8, K4GXS 5, W4DGH 3, K4FJZ 1. (Mar.) WA4SSB 136, K4WSW 14, WA4MGI 6.

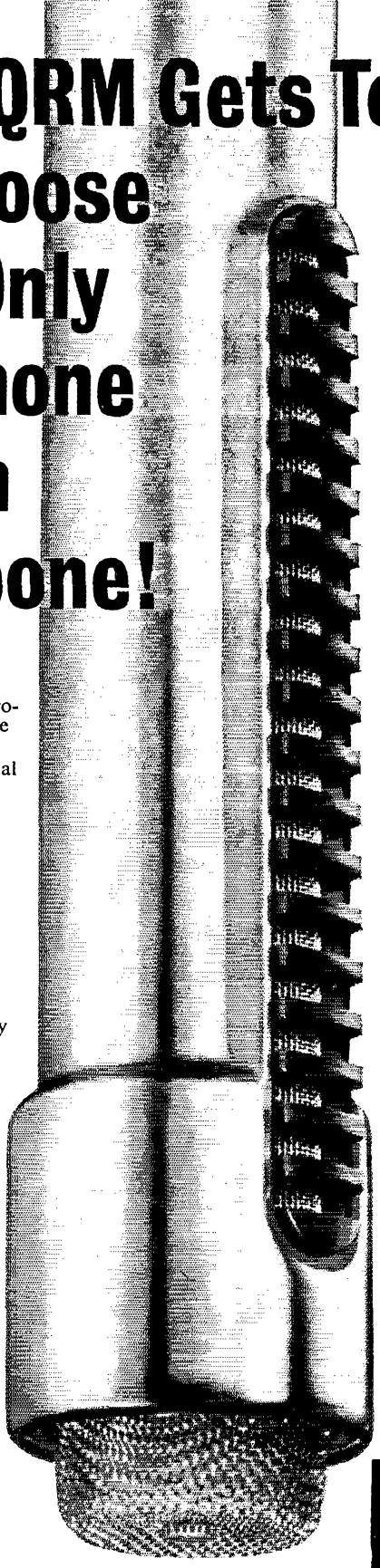
CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—The CZARA held its April meeting aboard the *Las Cruces* and the Crossroads ARC, as well as the LPRA of Panama, joined in. KZ5BX and KZ5GR soon will be rotating back to the U.S. KZ5GQ is attending school in the U.S. KZ5KR is due back from Oklahoma City by June. KZ5RM went to Japan on a business trip for the Panama Canal Company. KZ5PR has been to Washington several times. KZ5FM and KZ5GK have been rotated back to the U.S. K5LC is back from his long vacation. KZ5JT worked out a nice boom for the 20-meter beam. KZ5DR finished the new Heath linear. KZ5JT and KZ5TD picked up 2 converted BC-610s that have four 813s in the final running as linears. The new FCC Docket was presented at the last CZARA meeting with a thorough analysis prepared by KZ5PW. Serious thought has been given to this Do let by the local licensing authority, which already has proposed to have the same rules in effect as FCC, including distinctive calls. The Air Force MARS was active from Thunder Mountain during Field Day. The Army and Air Force MARS had a public display of amateur station operation during the Armed Forces Day celebrating May 15 from Albrook AFB. KZ5FN put up a tower and is using a 20-meter groundplane temporarily until he can finish his quad. KZ5CT reports that there are now six Canal Pilots on the bands, KZ5s CT, HK, KM, LT, NN and WY.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: C.W.: W4LUV. RM RTTY: W4RWM. PAM S.S.B.: W4OGX. PAM 40: W4SDR. PAM 80: W4TUB. PAM V.H.F.: WA4BMC. WB4ABK is the new call of the Brevard Engineering College ARC. WA4NEM is running 1 watt on 40 and worked 27 states. How about a peanut whistle club? The Ft. Myers Club was 12th in the Sweepstakes with

When QRM Gets Tough Choose The Only Microphone With Backbone!



ELECTRO-VOICE
MODEL 676
DYNAMIC CARDIOID



The backbone of the Electro-Voice Model 676 is no mere decoration. It's visible proof of the most exciting idea in directional microphones—Continuously Variable-D (CV-D)™.

Here's how it works. We attach a very special tapered tube to the back of the microphone element. This tube automatically varies in effective length with frequency. It's a long tube for lows—a short tube for highs. All this with no moving parts! The tube is always optimum length to most effectively cancel sound arriving from the back of the microphone, regardless of frequency.

This ingenious solution* is years ahead of the common fixed-path design found in most cardioid microphones. It means you pick up less noise and room reverberation, ensuring a crisp signal and optimum vox performance. It also is less sensitive to wind and shock—ideal for field days! There is almost no "proximity effect"... no boosted bass when you must operate extra close.

Long life and peak-free response are guaranteed by the exclusive E-V Acoustalloy® diaphragm. And the 676 has unusually high output for a microphone so small. Of course you get both 150-ohm and Hi-Z outputs, plus high efficiency dust, pop, and magnetic filters—indeed, all of the hallmarks of Electro-Voice design that have made E-V a leader for years.

But that's not all. The 676 has an exclusive bass control switch built in. Choose flat response (from 40 to 15,000 cps) or tilt off bass 5 or 10 db at 100 cps to eliminate power-robbing lows that reduce efficiency and lower intelligibility. You'll be amazed at the reports of improved audio you'll get when you switch to the E-V676.

Visit your E-V distributor to see this remarkable new microphone today. And when difficult QRM must be faced squarely, stand up and fight back with the microphone with a backbone (and CV-D)—the new Electro-Voice Model 676 dynamic cardioid!

Satin chrome or TV grey, $60.00 amateur net, Model 420 Desk Stand, $12.00 amateur net.

ELECTRO-VOICE, INC.
Dept. 752Q, 631 Cecil Street
Buchanan, Michigan 49107

Electro-Voice®
SETTING NEW STANDARDS IN SOUND

*Pat. No. 3,115,207

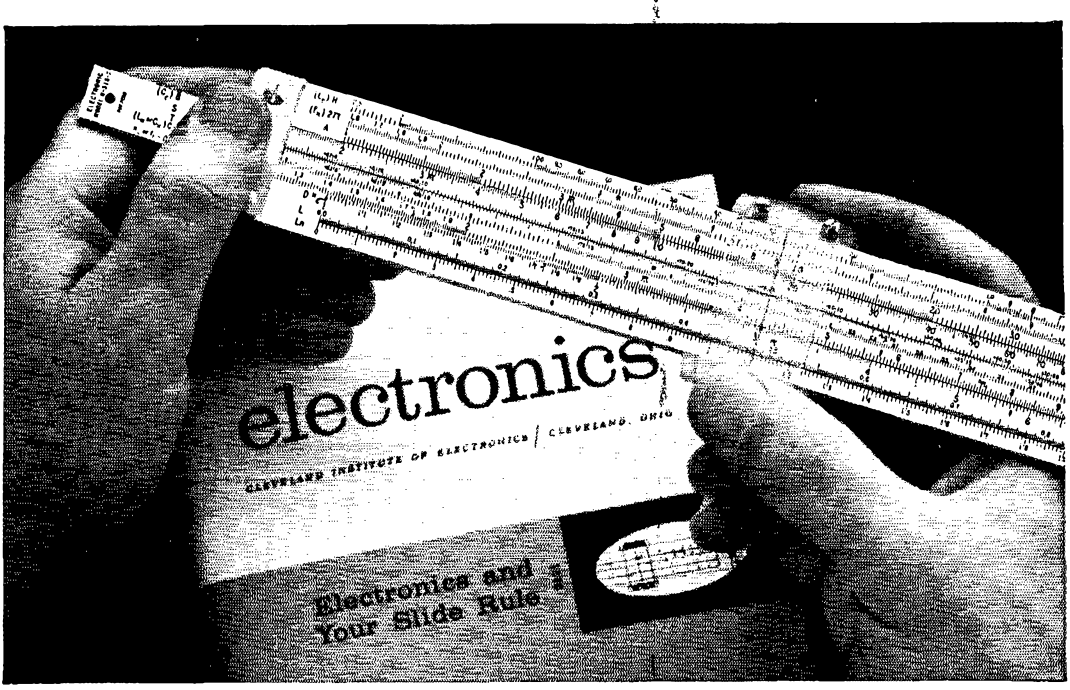
W4KET a winner. W4TUB is working on technical net sessions for those interested in obtaining a higher class amateur license. Along with this, c.w. code practice sessions include several stations assigned different speeds up to 18 w.p.m. Watch for *Skip* and SCM bulletins on this subject. All clubs are reminded that now is the time to organize tech. instruction and code classes for their members desiring to advance their license grade. In view of FCC's new proposals it seems like an early start would be wise. Stations reporting traffic should be sure to indicate the number of operators handling the traffic at your station. All who feel themselves qualified to hold ORS, OPS or OES appointments are asked to contact your RM or PAM. Those interested in OO or OBS should contact the SCM. Traffic: (Apr.) W4DFU 577, WA4BMC 446, K4YSN 350, K4VNG/4 348, WA4LHK 315, WA4IWO 279, WA4NEV 240, W4URX 231, WA4IJH 218, W4LUV 214, W4TUB 210, WA4COR 187, WA4CIQ 183, W4KIS 163, K4KDN 155, W4IEI 147, WA4TZC 143, W4SDR 120, WA4OAO 119, K4SJH 103, K4BY 99, WA4-BGW 95, WA4FGH 86, WA1AFP/4 81, WA4KDL 72, WA4MEQ 70, W4AKB 69, W4NLX 69, K4MTP 54, W4-BKC 51, K4BNE 48, WA4SCK 48, K4IYT 47, K4ILB 45, WA4DFZ 44, WA4MOL 44, WA4QLZ 44, WA4NBE 43, W4OGX 42, WA4VZD 38, W4IE 37, W4TJM 35, K4ENW 33, W4MVB 32, WA4JZT 31, WA4SCM 31, W4AYD 29, W4EHW 29, K4DAX 28, WA4FZV 28, WB4ABH 27, W4-FP 25, K4EBE 23, W4KRC 21, K4VNF 20, WA4PDM 17, W4QBY 17, W4SCY 16, W4SMK 16, WA4RXG 14, WA4-NBT 13, WA4TVN 12, WA4DEV 11, W4DFZ 11, WA4CJC 10, WA4LRW 9, W4BAV 8, WA4IYG 8, WB4ABK 7, K4-YOQ 7, WA4OBE 6, W4LVV 2, WA4NEM 2. (Mar.) W4TUB 213, W4FFF 174, WA4BGW/4 118, WA4JYB 88, K4ENW 39, W4BAV 6, WA4SCK 5, W4LVV 2. (Feb.) W4FFF 125.

GEORGIA—SCM, Howard L. Schonher, W4RZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4-SAZ. RM: W4DDY. PAMs: K4PKK, K4YZE, WA4-HSN, WA4JSU. WA4QHQ received a PSC award. K4-NFP is active on GSN and has the rig operating at school. K4MCL has closed down for lack of operating personnel. WA4GAY is a new ORS. K4YZE sponsored the Cobb County AREC Field Day. The Explorer amateur club station is back on the air from Rome. K4QNA has a Vibroplex. See you on GSN. Congratulations to WA4PSA on his graduation. WA4TYW is in the process of building a transceiver for 420. The Lanier-land Amateur Radio Club continues with interesting programs. W4KGP will direct Savannah activity for the powder Puff Derby. The Atlanta and Savannah Clubs are getting spring house cleaning and paint jobs. Congratulations to K4OUB on years of continuous activity as Tue. night net control for the Georgia Single Sideband Net. The Sowega Amateur club of Albany produces an interesting bulletin and 2-meter activity should be on the upswing in that area. W4RZL now has 2 and 6 Ameco transmitters and converters and a 2-6 beam up 65 feet. The Augusta club bulletin includes an interesting antenna sketch. Traffic: W4RZL 431, W4-DDY 167, W4SAZ 163, K4TKM 141, K4NFP 122, WA4-CJN 89, K4MCL 89, WA4GAY 83, W4PIM 34, K4FRM 30, WA4KRU 28, WA4QHQ 27, K4DKJ 23, WA4JSU 21, K4YZE 12, WA4VMV 10, WA4TYW 2, WA4JXL 1, K4-KHH 1.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: K4NAZ. RM: W4BVE. Section net reports:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*
QFN	3651 kc.	2330-0300Z	Daily	60	925
WFPN	3836 kc.	2300Z	Daily	30	225

Pensacola: WA4WKL works 40-15 meters and is looking for RTTY gear. WA4VVA has a TR-3; WA4URF has a 10-meter quad. Milton: K4NAZ is looking for contacts on 145.2 Mc. in the evenings. Fort Walton: W4BVE, W4TFL and W4RKH attended the Orlando Hamfest. W4BVE turned over QFN to W4LUV for six months. W4MMW has a Clegg 22er and a gain antenna installed in the new car. W4RKH is looking for an s.s.b. mobile rig. W6RTD is the new MARS Director at Eglin AFB. W4ZGS and WA4WJV put up 2-meter co-linear antennas. Panama City: K4VFY received an A-1 Operator Club certificate. WA4NRP has the c.d. station, WA4VXL, back on the air. Bonifay: WA4WUV was appointed Holmes County EC. Chipley: The XYL of EC W4IKB is now WA4ZFK. WA4SRR is now General Class. Tallahassee: Leon County has a new EC, WA4-EOQ. K4ARK, W4GAA and K4YPI are Asst. ECs for Nets B, C and D. K4DNY sold his Swan 120. W4MLE has a new fully air-conditioned shack. FCC Docket 15928 was the topic of discussion at the last TARC meeting. SCM W4RKH was a visitor. The TARC now meets at Deertree Hills Trailer Park on Highway 20 West. Traffic: (Apr.) WA4IMC 315, W4BVE 209, K4-



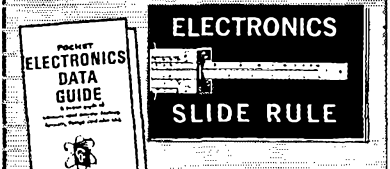
Tune In On This New Electronics Slide Rule With Self-Training Course

Once you've seen CIE's Electronics Slide Rule you'll know why hams across the country call it the most useful, practical tool they've come across in years. It's perfect for adjusting your rig . . . for designing test circuits . . . for figuring coil windings, db's, operating frequencies, resistor sizes and power ratings, proper inductor and capacitor sizes . . . for accurately matching antenna to final.

You'll be amazed how fast and easy it is to learn to use this terriffic NEW slide rule. It comes complete with a fully illustrated AUTO-PROGRAMMED Instruction Course. You will receive four lessons and be entitled to the services of CIE's expert instructors for answering any questions. In no time at all, you'll be using special scales to solve complex problems dealing with reactance, resonance, AC and DC circuitry, etc. And, as an added bonus, you can use this rule for conventional computation, too.

This all-metal 10" rule is made to our rigid specs by Pickett, Inc. . . . comes complete with top-grain leather carrying case and Instruction Course. A $50 value for less than $20. Send coupon for FREE Illustrated Booklet *plus* FREE Heavy Vinyl Pocket Electronics Data Guide. Cleveland Institute of Electronics, 1776 E. 17th St., Dept QT-106, Cleveland, O. 44114.

GET BOTH FREE!



MAIL COUPON TODAY →

Cleveland Institute of Electronics

1776 E. 17th Street, Dept. QT-106, Cleveland, Ohio 44114

Send FREE Electronics Slide Rule Booklet. Special Bonus: Mail promptly and get FREE Pocket Electronics Data Guide too!

NAME_____
(Please Print)

ADDRESS_____ COUNTY_____

CITY_____ STATE_____ ZIP_____

A leader in Electronics Training . . . since 1934

VFY 191, WA4EOQ 68, WA4JIM 32, WA4NRP 16, WA4-NVG 7. (Mar.) K4NMZ 75, K4VWE 65, W4WEB 20.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colyar, W7FKK—SEC: K7NIY. PAM: W7CAF. RM: K7TNW. Appointments: K7VOR as OBS. W6RVZ/7 as OES. Congratulations to WB6FHH/7 on making the BPL. W7PZF completed a v.s.w.r. bridge. W5PXN/7 worked two more states on 2 meters for a total of 12. K7YBB revamped his Challenger for a pair of 6146s. KØDXA/7 finally got his model 19 RTTY going on local loop and will be on 80 and 40 meters with it. K7VOR has a new 50-ft. tower. K7EFC is building a 432-Mc. parametric amplifier. K7-KVH joined the Silent Keys. W7KOL and K7RUR participated in the recent ARRL Frequency Measuring Test. The Arizona Amateur Radio Council's annual hamfest will be held July 31 and Aug. 1 at the Coconino County Fairgrounds, Flagstaff, Ariz. For details, contact K7VOR, 5040 N. 13th Ave., Phoenix, Ariz. Regular monthly reporting is a "must" to hold your appointment, hence, failure to report for three months invites a cancellation. Sickness, vacations and other valid reasons are taken into consideration. Please check the expiration date of your appointment and send your certificate to me for endorsement before it becomes delinquent. Traffic: (Apr.) WB6FHH/7 541, K7NHL 207, K7VTY 196, W7FKK 38, K7RUR 6. (Mar.) K4ANZ/7 3.

LOS ANGELES—SCM, John A. McKowen, W6FNE—Asst. SCM: John A. Vaidean, WB6JGA. Asst. SEC: W6FNE. RMs: W6BHG, W6QAE, WB6BBO. PAM: W6ORS. There are five Grand Champions this month for BPL Awards and if you look closely you will see we have a new addition to this illustrious group in the personage of WB6AKZ. The roster of Official Observers is up to fourteen: WB6BWZ, W6FSJ, K1GUD/6, W6-IBD, WB6IWF, WB6JGA, K6KII, W6LDA, WB6NMO, W6OZ, W6PCP, W6PUZ, WA6YKP and WA6YMY. I am proud to say this group is accurate with an average of 25.98 parts per million in the last FMT. WB6RBO got herself an adding machine and sent in a correct card, also put up a new antenna at the new QTH. All this in one month! K6GIL took 3rd place in the QCWA Contest. WA6TWS writes a long dissertation on the FCC proposal. W6YRS/UCLA is sporting a new emergency generator. WB6GXI reports the Harmonics Club is up to 22 members. W6OZ is proudly showing off his new 60-w.p.m. certificate from the CWA. W6NKR is showing off a new Drake R-4 receiver. W6SRE still is driving more than hamming. WB6MEQ is trying to use a sewing machine motor for a beam rotator. W6PUZ is making a v.h.f. frequency standard. WB6EXL is experimenting with antennas. W6AM got No. 337. W6ORS reports openings on 10 meters. W6MEP/K6MYK is operating as key OBS for the section. The Golden Bear Net reports 1706 net check-ins for April, an average of 56 per night. New appointments are WB6AKZ as ORS, WB6IOM as OES, WB6MEQ and WA6WKF as OBSs and W6FNE as Asst. SEC. Appointments were endorsed for K6KII, W1KUX/6, W6LDA, K2PHF/6 and WA6WJT. WB6BOW, editor of *QSY*, reports the Cresenta Valley ARC's officers are K6HV, pres.; WA6JXM, vice-pres.; WB6MEF, treas.; W6JU, program dir.; K6KDG, secy. The Southern California Division of the Salvation Army Disaster Communications Net had its Annual Dinner, Election and Installation. Present officers were reelected. The SoCal Six has the usual informative bulletin. OBSs send bulletins on all bands but 160 in the Los Angeles section. Have you checked the endorsement date on our appointments? How about your renewal to *QST*? How active are you in ARSPC? The Southern California Net (SCN) operates on 3600 kc. at 0300Z daily holding down NTS for this section. Traffic: (Apr.) K6EPT 980, W6GYH 909, WB6BBO 625, W6WPF 566, K6IWV 451, WB6AKZ 268, W6QAE 245, WA6TAW 217, WB6JGA 164, K6GIL 90, WB6KGK 80, WA6TWS 76, WB6GGL 63, W6FD 53, WB6BBH 42, WA6WKF 40, W6YRA 34, WB6KVA 31, W6BHG 24, WB6GXI 20, W6OZ 17, W6NKR 12, K2PHF/6 7, W6-USY 5, W6PCP 4, W6SRE 3, W6HUJ 2. (Mar.) W6WPF 695.

ORANGE—SCM, Roy R. Maxson, W6DEY—Asst. SCM: Albert F. Hill, Jr., W6JQB. SEC: K6YCX. Many ARRL inquiries were handled recently during the flood and tornado conditions by K6MJU. The Amateur Wireless Club of Villa Park HS has WB6ITM, pres.; WN6-LCU, vice-pres.; WB6IIH, secy.-treas. The 246 Net for April had 30 sessions on 145.08 Mc. at 1845 PDST with 702 check-ins handling 115 pieces of traffic, per WA6CXB, secy. W6VAA, EC for OC, and AREC members W6WRJ, W6QAT, WA6TSU, K6OZW, K6KTX WA6-NXQ, WA6DXJ, WA6ASZ, K6MJU, W6MRO and W6-DNA handled communications for the SCIF High School Tennis Matches. Also WA6WZQ, WA6VCS, WA6-UPF and WN6NLC did likewise for the Strip Sports

Penta Tube in First U.S.A.-Japan 160-Meter QSO

John Stewart, W6GTI, uses a Penta PL-4E27A beam pentode in the rig that was responsible for the first U.S.A.-Japan contact on 160 meters. He's enthusiastic about the PL-4E27A and feels that his Penta tube played an important part in this amateur radio milestone achieved on November 12, 1964. Although this historic contact was made on CW, the PL-4E27A is also excellent for single sideband linear amplifier applications. Capable of up to 425 watts input on SSB, the PL-4E27A, like all Penta beam pentodes, features high efficiency, low distortion, and excellent linearity. If you'd like to see a transmitter in which you can use the tube, turn to page 194 in the 1965 A.R.R.L., "The Radio Amateur's Handbook." For additional data on the PL-4E27A or any other Penta tubes, write: The Penta Laboratories, Inc., 312 North Nopal Street, Santa Barbara, California 93102 —Manufacturers of quality power tubes since 1951. A subsidiary of Raytheon Company.

Car Rally. The Desert RATS held a picnic and steak fry at Whitewater Fish Hatchery Apr. 25, per W6FB. Citrus Belt ARC members handled traffic at the National Orange Show in San Bernardino. Thanks to Irene Frame, editor of the *Monitor* and to W6WYH, for the NARS News. Traffic: W6ZJB 924, K6MCA 668, WB6JFO 233, WA6DFT 215, W6DNA 80, K6IME 80, W6WRJ 42, WA6CXB 10, W6DGM 5, W6PQA 4, WA6AOF 1.

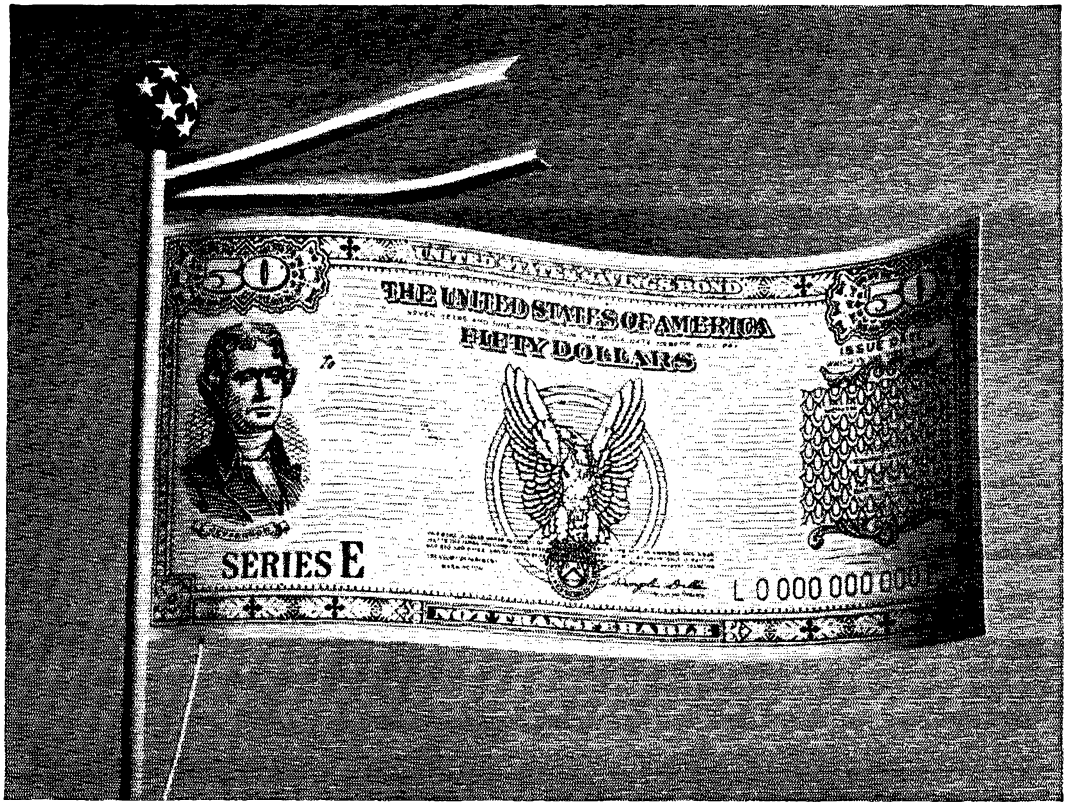
SAN DIEGO—SCM, Don Stansifer, W6LRU—It's nice to have W6BGF back in the traffic business. Our two RMs now are W6EOT and WB6JUH, both active on PAN and TCC. W6GJC gave an excellent talk on Fundamentals of S.S.B. to the Palomar Club in April. W6NWT has a new SB-300 receiver. WB6MXA is now in Yuma signing 7. The officers of the Helix Club are WA6PDF, pres.; WA6MOQ, vice-pres.; W6YST, secy.-treas. WA6SKT presented WA6OSB with their fourth harmonic. WB6KNN reports greatly improved DX conditions on 15 meters. K6BTO says five stations are active on 222.52 Mc. in the area. At the April meetings Vice-Director W6ECP gave the Council the lowdown on the FCC license proposal changes. WN6MSE, in Fallbrook, was very active in the Novice Roundup. The April San Diego DX Club meeting was held at the home of W6ZWK. Dana Junior High now has six Novices. Many San Diego area hams plan to attend the National Convention in San Jose the July 4 weekend. W6LRU became a grandfather for the second time in April. Four clubs sent in news this month, Palomar, Helix, San Diego V.H.F. and San Diego DX, plus the council. Traffic: W6IAB 3682, K6BPI 3325, WB6JUH 857, W6VNQ 821, W6EOT 457, WB6GMM 77, WA6ZWR 37, WB6KNN 35, W6LRU 24, W6BGF 21, K6LKD 12.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6OKN—RM: W7WST/6. K6AAK has his antenna array up on a new tower and WA6JBE has his self-supporting tower up with a Telerex Monarch tri-band beam at 60 feet. Again I would like to make a plea for more information about amateur activities, especially from the San Luis Obisbo and Santa Maria areas. If you would ask your club to put me on the mailing list for club papers, I could better report the activities of your area in this column. The Vandenberg Club is taking an active part in the upcoming hobby show. I believe this is the first such event for the area and is to be an annual event. WB6BII made a decision on linears and is building a Heath kit. His newly-completed house and ham shack are really beautiful. K6DW and K6BUD have both been transferred to Vandenberg but fortunately check in on 3895. Traffic: W7WST/6 399, WB6DPV 11.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—The Palestine ARC held its Annual Hamfest in Dogwood Park Apr. 25 with 225 registering and about 20 more attending. Attendance at this gathering is increasing every year so watch for next year's announcement and plan to attend. The Panhandle ARC held its 5th Annual Golden Spread Hamfest May 1 and 2 with more than 350 in attendance. The usual Saturday night meeting was held in the Armory with 130 hams listening to talks by W5UYQ, Vice-Director, K5TRY, Texas State RACES Communications Officer, Army and Navy MARS representatives and others. W5WB invited me to see his collection of antique radio equipment, the result of 40 years of collecting radio gear. If you ever get an opportunity to see this collection don't miss it as you will see radio gear from the beginning to the present day. W5HZF passed the Amateur Extra Class exam. K5SXU has completed his 6-meter rig with 120 watts input. This completes his capabilities for operation 160 through 2 meters. The following stations have qualified for Section Net certificates with NTS endorsement: W5CVB, WA5DQP, WA5EFO, WA5EXR and WA5HFU. Because of increasing duties with the OCDM, K5AEX has resigned as Section Emergency Coordinator. A new SEC will be announced as soon as possible. Traffic: K5DBJ 188, W5CVB 171, W5NSK 168, W5VFM 114, K2GKK/5 32, K5UOR 32, W5OSG 17, WA5JIJ 6, W5VEZ 4.

OKLAHOMA—SCM, Bill F. Lund, K5KTW—Asst. SCM: Cecil Andrews, W5MFX. SEC: K5JDP. The Red Cross is about to get a new building in Tulsa and the Electron Benders will have a new home in the Penthouse on top of the building. WA5MGQ is a new Technician in Bartlesville. The Explorer Post 104 in Bartlesville has been donated a 50-watt transmitter for its Novice operators. I think if more of us would look around we would find something that the Boy Scouts could use and aid in their interest in radio and other electronics. K5JTG has been keeping schedules with his son, K5JJE/2, now on duty at Ft. Dix, N.J., on 40-meter s.s.b. W5NBI is getting set up in Sapulpa and has been appointed OO. W5EHC advises that the Book-



Red, white & blue chip investment

You won't get rich overnight buying U. S. Savings Bonds. But for the long run, they make an excellent investment.

You get a guaranteed rate of interest—3¾% when held to maturity—so there are no ups and downs to worry about.

You also get certain tax advantages since Savings Bonds aren't subject to state or local income taxes and the federal tax can be deferred until the Bonds are cashed.

But probably most important is that Bonds pay off in more than dollars. When you get your Bond investment back, you know it has helped Uncle Sam strengthen the cause of freedom (your cause) all around this troubled world of ours.

Buy U. S. Savings Bonds and own a share of America. It's a good outfit to do business with.

Quick facts about Series E Savings Bonds

- ✓ You get back $4 for every $3 at maturity
- ✓ You can get your money when you need it
- ✓ Your Bonds are replaced free if lost, destroyed or stolen
- ✓ You can buy Bonds where you bank, or on the Payroll Savings Plan where you work

Buy E Bonds for growth —H Bonds for current income

Buy U.S. Savings Bonds

STAR-SPANGLED SAVINGS PLAN
FOR ALL AMERICANS

The U. S. Government does not pay for this advertisement. It is presented as a public service in cooperation with the Treasury Department and The Advertising Council.

store report a great upsurge in the sales of *License Manuals* and code records since the FCC came out with proposed rule-making. WA5EKL has his new 6- and 2-meter beam up and ready for skips. Hope to see you all at the West Gulf Division Convention in Oklahoma City, July 9, 10 and 11. Drive carefully while on vacation. Traffic: K5TFY 996, K5DLP 470, WA5BTQ 328, W5NML 185, W5HZZ 85, W5MFX 76, WA5IDX 73, K5-KTW 65, W5PML 62, WA5ETA 48, W5QMJ 44, W5DRZ 42, WA5EQP 26, K5CBA 17, W5EHC 11, W5UYQ 8, K5OCX 4.

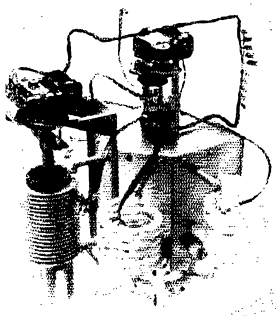
SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5-AIR—SEC: K5RDP. PAM: W5ZPD. RM: K5ANS. W5AC now has a new dummy load for the KW. K5ANS has a new air conditioner—may be able to keep his keyer cooled off. WN5FAS has a new call, WA5MCP. Several new amateurs will be on the air from College Station soon. K5LZA has a Model 15 RTTY complete with converter. K5KSE is the new Chairman of the Memorial Student Center Amateur Radio Committee and is pres. of the W5AC Club, Texas A. & M. Univ. K5LQJ is a regular operator at W5AC. W5ALF was promoted to Patrol Sgt. with the San Antonio Police. K5MZH is helping to keep things going with c.d. communications in San Antonio. W5ABQ works about 50% traffic and 50% ragchew along with the C.W. Emerg. Net. Thanks to WA5BUI, aboard the USS *Cadmus*, for the report. He says that WA5AXW is aboard the USS *Haynsworth* and ex-WN5GMW is aboard the USS *Semmes* and working for a General Class license. All three are former Brenham, Tex., amateurs. Thanks to you South Texas amateurs for your traffic and activity reports. Keep them coming. Reports for April came from W5ZPD, K5ANS, K5ELJ/5, K5LQJ, W5ABQ, K5ZSC, K5HZR and WA5BUI/MM/1. The Houston Amateur Radio Club was guest of the Naval Reserve's first meeting in May with a good turnout and nice program. Conditions have been poor in So. Texas with thunder storms, many tornadoes and skip. The South Texas Emergency Nets are busy selecting their various officers for the coming year. The West Gulf Emergency Net has set aside the first ten minutes of net time for stations with emergency power to check in, the next few minutes are for mobiles on the first Sunday of each month, creating an incentive to get the emergency power plants in good operating condition for the coming hurricane season. W5AIR was on the Disaster Session Panel for the Texas State Red Cross Conference held in Houston Apr. 9 and 10. Best of luck to all Field Day operators. Traffic: K5HZR 226, K5ANS 111, W5ZPD 70, W5ABQ 51, W5AIR 9, K5ZSC 4, K5EJL/5 1.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FK. PAM: VE6PV. ECs: VE6SA, VE6SS, VE6-AFJ, VE6HB, VE6ALL. RM: VE6AEN. ORS: VE6BR. OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA, VE6ADS. OOs: VE6HM, VE6NX, VE6TW, VE6TY. OBSs: VE6HM, VE6AKV. OESs: VE6DB, VE6AKV. Have you registered for the International Hamfest to be held at Waterton Lakes July 17/18? Calgary AREC had a very good test on Apr. 3 with 27 taking part; also on Apr. 24 mobiles assisted with the Salvation Army Parade and mobile communications turned out to be very helpful. Vulcan now has more new hams; you can get a certificate when you work so many. All ECs are requested to get their reports in to the SEC a little earlier so that they are not missed for a particular month. It appears that you are stuck with me for another term, but I am unable to do much without the help of all. How about a little support, and I don't mean with a two-by-four? At the present time it looks like Calgary and Vulcan are the only places that have any respect for amateur radio. Traffic: VE6HM 159, VE6FK 55, VE6ADS 11, VE6XC 11, VE6SU 9, VE6SS 7.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —Request for motor vehicle call sign license plates for 1966 may now be made by contacting, Wilf Stevens, VE7AKY. We asked for 350 plates. Some forty of us failed to pick ours up and yet we signed our name to a form requesting them. The Motor Vehicle Branch is not pleased with our actions. The British Columbia Slow Speed Net, 3700 kc. Mon. through Sat. at 0400 GMT, still is looking for more new members. VE7OM and VE7BAH are out of the hospital and on light duties for some time. VE7JI is back in the hospital in a serious condition. VE7AKD has taken up an old call to keep it alive, VE7BJ. We are sorry that Ed has given up amateur radio after fifty years of pioneering amateur radio in the west. VE7BFN/8 is wrapping up DX like mad. The OK Hamfest will be held at OK Falls, July 31-Aug. 1. The British Columbia Amateur Radio Association's Annual Picnic will be held at Bear Creek Park, North Surry Sun. Aug. 22. VE7AOI, net manager for the BCARPSC Net on 3755 kc. has been conducting the net for all of four years and has re-

VDX-5 NEW 5 BAND VERTICAL



Antenna coupling unit mounts at base of antenna and has:

Separate edge wound silver plated coil for each band.

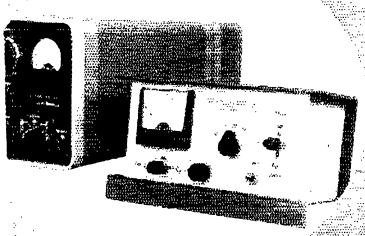
Transmitting type ceramic capacitors.

Heavy Steatite insulated motor driven band switch.

Ferrite, motor-tuned 80 meter coil for best VSWR over entire band.

Weather protected enclosure.

All enclosures and turret metal parts iridited aluminum for weather protection.



Control unit sits on the operating desk and:

Measures VSWR and power output.

Switches bands with a rotary switch.

Tunes 80 meter network with a lever switch.

Delta makes military type antenna systems but the boss is a ham. He came to work one day with a specification that looked like a government engineer had prepared it. Translated it said: I want an antenna for my ham rig that:

A. Will cover 80-40 — 20-15-10 meters and conservatively handle the legal limit on all bands.

B. Will really match the 50 ohm output of my rig. (His linear is fussy about this.)

C. Will pass inspection by fussy neighbors and XYL.

D. Won't take any space in my back yard.

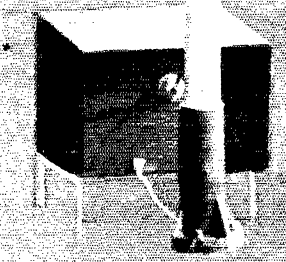
E. Doesn't attach to my new house.

F. Won't occupy any space on my already crowded operating position.

G. I can tune and change bands without moving from my chair. Doesn't dump all the power in traps, poor grounds, water pipes, roof gutters, etc.

H. Drags in Real DX.

The engineers came up with the VDX-5, and, it really works.



WRITE FOR DETAILS:

DELTA ELECTRONICS

4206 WHEELER AVENUE, ALEXANDRIA, VIRGINIA PHONE 836-3133

quested he have a rest from this chore. Therefore, the net is running with a daily net manager. VE7AKE, VE7FB, VE7APF, VE7BCV, VE7BHW and VE7BHH with VE7APF filling in for those who fail to make net control. We are looking for others to help. Traffic: VE7BHH 101, VE7QQ 59, VE7BIY 43, VE7BBB 26, VE7OM 26, VE7AKY 12, VE7BHW 8, VE7BOQ 6, VE7CT 6, VE7DH 4.

MANITOBA—Acting SCM, M. S. Watson, VE4JY—VE4OL, our SEC, is back in Winnipeg and active in arranging projects for AREC members. VE4HB recently gave a talk to the young people on amateur radio at the Deere Lodge United Church. VE4UE has erected a fine six-element rotary beam. The WARA elected VE4LK, pres.; and VE4FB, vice-pres. VE4VJ has returned from Florida and is back on the air. While in California VE4SR had many FB contacts with Manitoba amateurs on his mobile rig. VE4DQ has returned from a holiday to the West Coast. ARLM has revamped its publication, *Satellite*, to an attractive printed issue well conceived and illustrated. An interesting feature, "The Diary of a Ham," written by VE6KZ, taken from the little publication *Canadian Wireless* founded by him in 1921 is said to be the first Canadian magazine devoted to radio. VE4RS contributed an excellent article on Pi-network. VE4RF still is in the hospital at Brandon but recovering slowly. VE4JT, our RM and EC at Brandon, still tops the list in traffic and reports the MTN C.W. Net has 14 stations checking in, VE4UB being the newest addition. Traffic: VE4JT 149, VE4QX 120, VE4SW 15, VE4NE 14, VE4SC 12, VE4EI 11, VE4QD 10, VE4EP 9, VE4JA 8, VE4LG 8, VE4JY 6, VE4QJ 6, VE4UX 6, VE4DL 3, VE4EF 3, VE4EG 3, VE4OL 3, VE4PE 4, VE4TM 1, VE4XN 1.

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and R. P. Thorns, VO1EI. We are pleased to announce the appointment of F. R. Fraser, VE1HJ, as SEC. Ralph will appreciate your cooperation and assistance in the ARPSC. The club call of RCAF Station Greenwood has been changed from VE1AOS to VE1ANL in memory of F/O Cocks. The Greenwood Club reports that all those who attended the classes recently conducted by the club passed their DOT exams with flying colors. Congratulations to all. VE1AGH and VE1LZ were recent dinner guests aboard Canadian Navy Ship *Cape Scott* in appreciation of their handling of traffic during the ship's Easter Island trip. VE1LZ and his XYL enjoyed a trip from Bermuda to Halifax aboard *Bluenose II* with VEØMY and crew. Newly-elected officers of SONRA include VO1FG, pres.; VO1HI, vice-pres.; VO1AW, secy. VO1GO and VO1GP are the proud owners of an HW-12 and now are on s.s.b. VO1FX recently was presented with the Bob Lewis (VO1BL) Award. VE1APS is a new call in Sussex. VE1ABS has a new home-brew transmitter on the air. Don't forget the convention at Digby, Labor Day week end. Traffic: VE1HE 35, VE1ABS 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—VE3EUM, the SEC, reports his EC Net is on Sun. at 10 P.M. EDST on 3765 kc. All ECs are requested to call in. The Belleville Club had an FB booth at the local Rotary Show. VE3DHH will be on 2 with his 522 soon. VE3NU is now in Carrying Place, while VE3ELR is in the Belleville area. VE3CXK is 2-meter EC for the Windsor area. Your SCM had a fine visit with the Windsor Club. Special thanks go to VE3ETM and VE3BJK for a grand meeting. The Scarboro club held a successful Old Timers Nite. VE3WSB was active at the Coliseum during the Scouting in Action Show. VE3DRF was heard operating on s.s.b. Windsor hams had a rough time at the hands of the RCMP trying to prove ownership of their rigs. Many had *no* receipts for their purchases. While *our Canadian Director is* trying to get the tariff lifted on imported gear from the U.S.A., this type of thing is going on. VE3DJK, the editor of Cornwall's *Ham Bull*, will exchange his club paper with those who wish to do so. The plans at Sudbury are well under way for the Ontario ARRL Section Convention. Write to VE3BLZ or VE3EAT for information. The Gray Bruce Net is racking up the points these days on c.w. Traffic. The ECN and the OQN C.W. Nets seem to lack operators. This writer has on many occasions requested the help of the newcomers, but without success. The RMs might take a second look and try to let us know the reason why these nets are not popular, and attract more of the new operators. Lack of on-the-air operators in the Port Arthur-Fort Francis area is becoming a bit of a problem in the traffic department. Many messages for this area have to be routed via Winnipeg. How about it up there? Get on the air. Your SCM would appreciate hearing from you. Traffic: VE3CYR 160, VE3DPO 140, VE3NG 136, VE3EBC 90, VE3DMU 78, VE3FGV 76, VE3EHL 59, VE3EUM 50, VE3BLZ 42, VE3GI 37, VE3ETM 32, VE3CFI 25, VE3HW 23, VE3DVE 19, VE3-

TREMENDOUS SAVINGS ON LIKE-NEW EQUIPMENT

for the SWL, Newcomer, or Extra-Class Amateur

- **Two-Week Trial**
- **90-Day Guarantee**
- **Trades Accepted**
- **Plenty of Free Parking**

Whether you are a shortwave listener, a potential ham, a UHF enthusiast, or possess one of those rare two-letter calls, Trigger Electronics is where you will get the cleanest, most dependable, like-new equipment at sensational savings for such gear. And it performs as brilliantly as it looks!

SEND FOR FREE PRICE LIST

Whether you want to buy a key, a code practice set, or a top-quality receiver or transmitter, Trigger has the gear and is ready to get you started out right. Send stamped self-addressed envelope for free price list.

SPECIALS OF THE MONTH FOR JULY

S1J3	$495	HX50	$289
S1J4	895	HXL-1 LINEAR	279
75S1	299	HC10	69
32S3	569	NCX3	239
KWM1	279	NCXA	79
AC SUPPLY	79	NCXD	79
DC SUPPLY	99	NC60B	44
MOBILE TRAY	29	NC155	149
KWM2	749	NC190	149
32V3	199	NC270	159
SWAN 120	139	ELMAC AF68	99
SWAN 240	269	ELMAC PMR8	97
SWAN 400	299	M1070 SUPPLY	47
SWAN 406VFO	59	G66B 6-3WAY SUP.	79
DRAKE 1A	119	G76 TRANSCEIVER	149
DRAKE 2B	199	G76 DC SUPPLY	69
TR3	429	GSB100 SSB XMTR	199
RV3	59	GSB201 LINEAR	199
AC SUPPLY	59	GONSET 2B 2MTR	129
SX99	79	GONSET 3 6MTR	149
SX100	179	GONSET 4 6MTR	229
SX110	89	CENTRAL 20A &VFO	119
SX111	149	RME VHF152A	49
SX140	77	RME DB23	32
S38E	37	RME 6900	179
S85	69	THOR6 & AC	299
S86	59	CLEGG 99ER	87
S108	79	POLYCOMM PC62B	249
S119	29	POLYCOMM PC6	199
S120	44	POLYCOMM PC2	249
SR160	237	DX60	77
SR160DC	77	DX35	39
FPM200	975	HR10	77
HT32	289	MR1	57
HT33	249	MT1	49
HT37	299	RX1	169
VALIANT	179	TX1	169
JOHNSON 500	349	HA10 LINEAR	189
INVADER 200	339	HW10	179
THUNDERBOLDT	299	HW20	199
RANGER FM/PTT	129	6ER	44
RANGER 2FM/PTT	259	TWOER	47
6N2 VFO	32	KNIGHT VTVM	24
MATCHBOX	44	LAFAYETTE HE35A	49
HQ145C	149	LAFAYETTE HE45B	97
HQ170C	217	XT320	49
HQ170A	279	GLOBE CHIEF	37

NEW HALLICRAFTERS DRAKE SWAN SBE *equipment*

We also stock the complete line of brand--new HALLICRAFTERS DRAKE SWAN SBE *equipment. Used gear accepted in trade. Write* TRIGGER *for* UNSURPASSED *trade--in allowance.*

Another important TRIGGER service: WE BUY USED HAM GEAR FOR CASH

PROMPT SERVICE / PROMPT CASH!

TRIGGER Attn: W9IVJ (ABC1234)
7361 North Avenue
River Forest, Illinois Amount
(suburban Chicago) Enclosed

RUSH THE FOLLOWING:

_____

_____

_____

NAME_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

ORDER BLANK TO: (1) send for free price list, (2) trade ur present gear, (3) order equipment, (4) sell ur gear for cash.

FOREIGN INQUIRIES INVITED

(A small deposit will hold the unit of your choice on Lay-Away)

STORE HOURS

Weekdays .....1:00-8:00 P.M.
Saturdays .....9:00-3:00 P.M.
Or by Appointment After Hours

TELEPHONES

From Outside Chicago.....PR 1-8616
Chicago Area Only.....TU 9-6429
Business phones with QTH Extensions

TRIGGER Electronics

7361 NORTH AVENUE • RIVER FOREST, ILLINOIS

DWN 17, VE3TT 15, VE3AKQ 13, VE3BWM 10, VE3-DH 7.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—We regret to announce the resignation of VE2BEZ as Asst. SCM. Business prevents him from carrying on. We appreciated his contributions while in office and hope to be able to find a successor. VE2AUU, our SEC, has been appointed National Emergency Coordinator for Canada. This is a new office and we are pleased and proud that this honor has been bestowed on Murray, who is devoting so much effort and time to building up the AREC organization. He is advocating a Trans-Canada AREC Net to operate weekly on 14,140 kc., Sun. at 1800 GMT with two NCSs., East and West. VE2ALE informs us that the North River Club, which meets at Colford Lodge four times a year and stresses h.f. operation, has a very enthusiastic following. When VE2DZ visits France and Belgium this summer he expects to meet many of his QSO pals in person. One of the operators from VE8ZZ was a welcome guest at the Lakeshore Club monthly meeting. He will look for VE2s on 14,160 ks. VE2AGQ in Toronto for the summer and VE2BRD has a job in Alberta. His brother, VE2BRT, will carry on during his absence. VE2ANK now is an OO and an enthusiastic DX-chaser. VE2EC reports the new executives for the St. Maurice Assn. are VE2s AGI, VE, AAV, AUS, AIA, BW, ANK and BIX. VE2BTF is very active. He is a good technician and always ready to help the ham fraternity. VE2OR had a pleasant vacation down in Florida. Traffic: VE2BRD 298, VE2DR 89, VE2OJ 28, VE2EC 25, VE2CP 22.

SASKATCHEWAN—SCM, Mel W. Mills, VE5QC—Congratulations to VE2AUU on his appointment as National Emergency Coordinator for Canada. Glad to see VE5NX chairing the AREC Net Sun. at 0830 Central Standard Time on 3730-35 kc. All AREC members are urged to check in. Congrats to EC VE5VD and the Regina gang of the AREC on the good showing in the provincial exercise held May 16. Thanks to all AREC members who checked in. Special thanks to all amateurs and their families who attended "Hamfest '65." Without your support it could not have again been "Western Canada's Largest and Friendliest Hamfest." Also a special thanks to the Saskatoon gang who pitched in and worked so hard to get the desired results. Don't forget, gang, to break periodically to listen for mobile traffic now that the summer season is here.

144 Mc. Converter

(Continued from page 25)

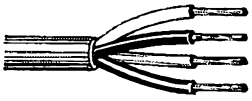
a.m. signal, gives nearly equivalent results if tuning is adjusted for maximum readability rather than maximum gain. For C_2 in particular, tuning for maximum gain does not coincide with tuning for best weak-signal intelligibility. Tuning of the other circuits has only a small effect on noise figure.

Performance

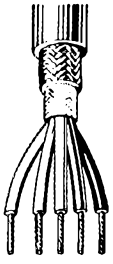
The gain of this converter is somewhat less than that of one using a cascode amplifier. However, it is more than adequate for use with a receiver of reasonable sensitivity. When used with my SX-117 receiver, it is necessary to reduce the converter's gain. I have no means for making quantitative measurements of noise figure or sensitivity. However, antenna noise is barely but definitely perceptible at this fairly quiet location. Solar noise can be detected when the antenna is pointed at the sun. From a more practical standpoint, I can now copy stations that previously I didn't know were there. This creates a new frustration since many of them can't hear me. Anyone for a new converter? QST

Belden Wire and Cable for every ham application

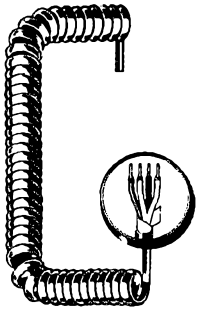
service rated—quality controlled easy-to-use packaged lengths



Antenna Rotor Cables. Sturdy, flexible, plastic insulated cable for all Ham antenna rotor applications. Color coded for easier hook-up. Chrome, vinyl plastic jacket resists sun and aging.

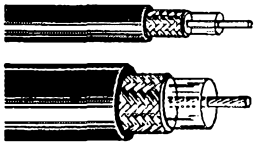


Power Supply Cables. Provide dependable service as power supply cords, interconnecting cables on electronic equipment, remote control circuits, special press-to-talk microphone circuits, and other ham applications. Designed for long service life with excellent mechanical and electrical characteristics, and uniform quality. Special jacket offers maximum resistance to abrasion and ozone.

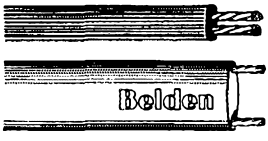


Coiled Microphone Cable. Provides low impedance for mobile microphone applications. Black neoprene jacket remains flexible at low temperatures. Available with or without shielded conductors.

Shielded Hook-up and Grid Wire. Provide most effective TVI suppression. Vinyl insulated with tinned copper braid shield. Available in wide range of capacities from 24 AWG to 12 AWG.



Ham Transmission Lines—75 Ohm Foam Core RG/U Type. Designed for lowest losses, longer service life, and maximum dependability. Cables are essentially flat with no peaks in attenuation to reduce signal on either high or low frequencies.



Ham Transmission Lines—Parallel Type. Made with brown virgin polyethylene for best weather resistance and lowest losses. Uniform quality control prevents standing waves and mismatches.

Belden
WIREMAKER FOR INDUSTRY
SINCE 1902 – CHICAGO

Magnet Wire · Lead Wire · Power Supply Cords · Cord Sets and Portable Cord · Aircraft Wires · Electrical Household Cords · Electronic Wires · Welding Cable · Automotive Wire and Cable

8-2-3

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1AWP, Geraldine Gale, Barre, Vt.
W1EYR, George W. Hambrook, Sharon, Mass.
K1FMW, Donald J. Buckley, Newton, Mass.
W1FW, Gerald J. Heddemon, Atkinson, N. H.
W1JIS, Charles F. Loud, Gardiner, Me.
W1TCH, Philip J. Shea, West Dennis, Mass.
W1VSU, Arthur G. Schwarzenberg, Andover, Mass.
W2AAD, Frederick C. Sipp, Yorktown Heights, N. Y.
K2EN, A. E. Olsen, Yonkers, N. Y.
W2FXC, Louis R. Biagi, Schenectady, N. Y.
W2IDS, Arthur Page, Nutley, N. J.
W2LXB, Frank Maraguglio, Newark, N. J.
WB2LZG, John B. Morgan, New York, N. Y.
W2MGZ, William C. Park, Brooklawn, N. J.
W2MMD, Malcolm T. Mason Monroeville, N. J.
WN2MTS, Howard Stiles, Port Norris, N. J.
W2NRZ, Vito A. Sangregorio, Brooklyn, N. Y.
ex-W2PCU, Martha Truman, Yonkers, N. Y.
K2PHH, Nicholas J. Eckert, Akron, N. Y.
K2PMD, John L. Cathie, Alexander, N. Y.
WA2YCU, Leo J. Matthews, Pompton Lakes, N. J.
ex-3AOD, Richard W. Delmotte, Harrisburg, Penn.
W3AU, Wendell W. King, Erie, Penn.
W3AXZ, William T. Hamilton, Conowingo, Md.
W3BZF, Harlow H. Stege, Philadelphia, Penn.
W3LAO, S. Richard Dresser, Emporium, Penn.
W3RP, Robert C. Barnes, Baltimore, Md.
W3RVM, John H. Stephens, Haverford, Penn.
W3UMK, Richard C. Berens, Bala-Cynwyd, Penn.
WA4BGT, W. A. Simcox, St. Petersburg, Fla.
W4HVQ, Martin J. Mulqueen, Norfolk, Va.
WA5BOB, James T. Jetton, Salina, Okla.
W5FXC, Edgar Lee, Hattiesburg, Miss.
W5JEZ, George T. Vasilescu, La Marque, Texas
ex-W5OFN, Robert H. Latham, Eastland, Texas
K5RIX, C. B. Patterson, Hattiesburg, Miss.
ex-W6BBR, Bruce Grenfell, San Diego, Calif.
W6BPM, Kenneth Kiernan, Rosemead, Calif.
W6HCI, Bela V. Foldesy, Palm Springs, Calif.
W6LOS, John W. Guerard, Fresno, Calif.
K6UOM, Allen W. Hingle, Escondido, Calif.
W7AWI, Derril Austin, Gold Beach, Ore.
W7AWT, Eric J. Munro, Tooele, Utah
W7FU, Douglas F. Bates, Gearhart, Ore.
K7KVH, Herbert W. Squires, Mesa, Ariz.
W8FFY, James A. Thompson, Detroit, Mich.
WA8GBI, Harold A. Wages, St. Clair Shores, Mich.
WA8IQU, Clarence W. Riddell, Whitehall, Mich.
K8VQM, William E. Coffman, Coshocton, Ohio
K8ZVC, Richard H. Wiersema, Grand Rapids, Mich.
W9ALL, Joseph F. Hurley, Lafayette, Ind.
ex-W9AVY, Joseph Nakutis, Northlake, Ill.
ex-W9LF, Elmer F. Wurzburger, Bartonville, Ill.
W9SJL, Clarence J. White, Woodruff, Wis.
WØALA, Lee Cheney, Wichita, Kans.
WØCCZ, Francis J. Novak, Alton, Mo.
KØIBR, Matthew J. Clemens, Easton, Minn.
KØKLU, Jerome V. Isakson, Dickinson, N. D.
WAØKQA, Doyle C. Carr, Columbus, Neb.
WØLO, Clarence R. Hodgson, Denver, Colo.
HP4CS, Castro E. Sanchez, Jr., Bocas Del Toro, Panama
VE1AIA, A. A. McArthur, St. John, N. B., Canada
VE1ANL, H. J. Cocks, Greenwood, N. S., Canada
VE1LW, Ross C. Clements, Gunningsville, N. B., Canada
VE1ZH, Carl M. Sorge, Kingston, N. S., Canada
VE3BV, Garry Moes, Aldershot, Ontario, Canada
ex-VE5CO, Samuel John Lawrence, Victoria, B. C., Canada
VK2YC, James B. Corbin, Eastlakes, Mascot, NSW, Australia

Low cost transistorized commercial SSB transceiver

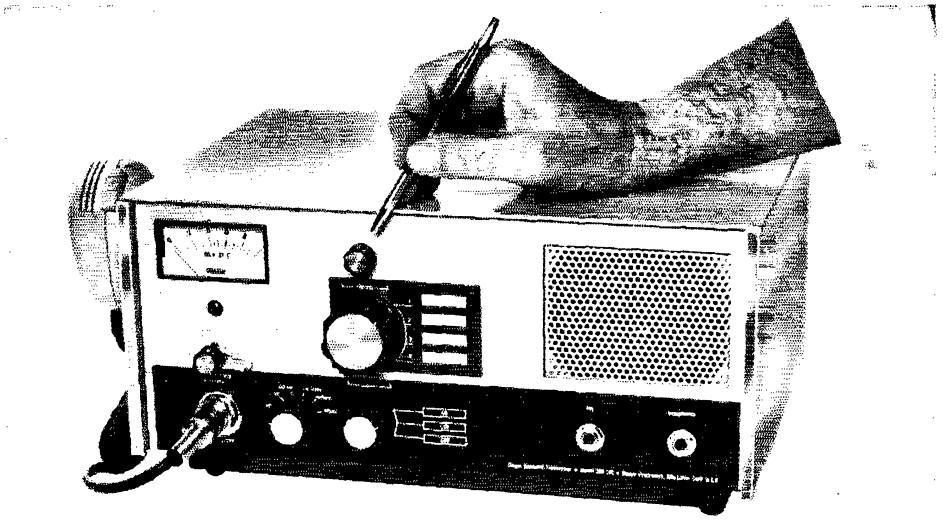
Designed for both mobile and base station operation, the SSB-100 transceiver gives you dependable long range communications with low battery drain. It is ideally suited for use where conventional power sources are not available.

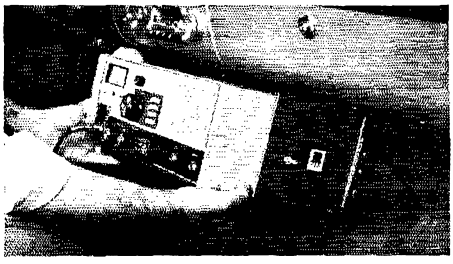
Transistorized construction reduces battery drain to less than 100 ma. during reception. Instant heating power amplifiers operate at the 100 watt P.E.P. level to provide immediate communications. Four crystal controlled channels can be selected throughout the 2-18 mc. range.

The unit is built to withstand severe environmental conditions encountered in military, construction and agricultural usage.

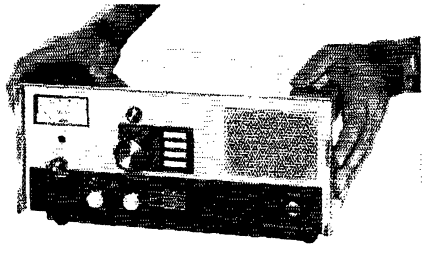
In addition to commercial applications, the SSB-100 has been approved for matching fund Civil Defense purchases, and may be used by non-amateur operators in RACES networks.

Prices start at $795.00; full line of accessories available.





Designed for both base station and mobile use, the SSB-100 can be removed from an office and quickly slipped into a foldaway mounting for mobile operation.



SSB-100R Four-channel crystal controlled receiver uses clarifier control to eliminate crystal ovens and further minimize battery drain.

Write for descriptive brochure and specifications.

STONER

STONER ELECTRONICS CO., INC.

POST OFFICE BOX 7388 • ALTA LOMA, CALIFORNIA, U. S. A.

Novice Round-up

(Continued from page 90)

SOUTHEASTERN DIVISION

Alabama

WN4UGE	5502-131-42-18
WN4VZE	5236-109-44- –
WN4WAG	4284-109-36-21

Eastern Florida

WN4VOC	5330-130-41-18
WN4VSY	4859-113-43-14
WN4TRJ	2856- 84-34-19
WN4UUE	1134- 81-14-10
WN4USO	861- 31-21-19
WN4VFN	216- 9- 9- 3
WN4WTX	75- 5- 5- 2

Georgia

WN4VNR	1568- 46-28-11
WN4UPE	1296- 48-27-11
WN4SPU	75- 5- 5- 1

West Indies

WP4CLB	8640-192-45-16

Western Florida

WN4UWQ/4	6210-120-46-40
WN4UMJ	2883- 93-31-19

SOUTHWESTERN DIVISION

Arizona

WN7BOB	11,250-210-50-26
WN7BOA	4920-105-41-14
WN5LBC/7	3910-100-34-30
WN7BKG	3762-104-33-28
WN7BNH	2835- 66-35-14
WN7AHU	2808- 72-39-11
WN7BIM	532- 28-19- 8
WN7BIA	187- 17-11-11

Los Angeles

WN6LCD	5043-113-41-20
WN6NRO	1518- 66-23-18
WN6KPR	1000- 50-20-11
WN6NBU	969- 42-17- 7
WN6MYJ	782- 46-17-20

San Diego

WN6NBL	9114-186-49-29
WN6MBE	4387- 92-41-40
WN6KGJ	4248-118-36-40
WN6NGE	1836- 53-27-12
WNGNAW	884- 52-17-12
WN6MIS	312- 26-12-13

WEST GULF DIVISION

Northern Texas

WN5KTE	4107- 96-37-10
WN5KNH	150- 5- 5- 4

Oklahoma

WN5KZA/5	4816-102-43-40
WN5KJV	741- 29-19- –

Southern Texas

WN5JMY	12,100-220-55-10
WN5LKM	1008- 42-24-13
WN5KGX	966- 42-23-16
WN5LVG	108- 12- 9- 1

NON-NOVICE SCORES

K1ZND 10,250, K1BCS 5124, W1DYE 1320, WA1CRK 756, W1AW (Multi-opr.) 260, WA1CYT 182, W1BGD 36 WB2BWH 4624, W2GSA/2 (WB2KXG, opr.) 1352, WB2ORD 3944, W2MUM 3700, K2PDK 2945, W2NEP 2001, WB2HTJ 1656, WB2HZY 1650, W2NIY 744, WB2QAW 616, WB2PPG 504, WB2JQS 462, WA2ZMR 160, WB2QQR 20, WA3AFI 3424, K3HNP 2926 K3WWP 1350, K3WJV 1080, WA3AZI 1000, WA3AYC 490, K3WTV 348 K3OJK 300, K3YQP 187, W3KCM 76, KG4AM 6300, WA4TLB 4522, K4GMR 3024, WA4HVC 2828, WA4MKG 2369, WA4PAE 2052, W4DR 1972 W4KFC 1740, WA4TLJ 1560, WA4QOC 1300, K3LSX/4 95, K4RQE 48, WA4PRF 20, WA4SGD 4, WA5HGP 2088, WA5IPM 736, WA5KQN 630, WA5HBP 352, K6QCF 5180, W6TYM 2900, WB6IEX 2870, W6OEO 1860, WB6LIV 1764, K6TWE 960, WB6NQS 451, WA6VTL 285, WB6ETY 125, WB6FRP 81, K6LRN 16, W7AYY 18,975, W7AWH 15,500, WB6FHH/7 5494, W7POU 3990, W7IUO/7 2356, K7SQD 2214, K7YWM 1944, WA7ASM 1007, K7WQO 396, K7UOF 16, K8SWW 5754, WA8KHP 5548, WA8AMH 1625, WA8MCD 1488, WA8MQE 1120, WA8KME 1060, WA8LAN 900, WA8HRY 836, WA8ALA 680, W8WEG 594, WA9DMH 4284, WA9JIQ 3003, WA9CIO 2310, W9YH (WA9FBC, opr.) 1725, WA9EKJ/9 1476, WA9NES 1134, WA9LOI 1120, WA9LMB 1012, WA9MXG 798, WA9FBC 196, WA0HYI 6426, WA0HYG 1711, WA0EJC 1704, WA0FEQ 300, WA0HCV 126, K0GSV 116, VE3AQN 578, VE3CNA 330, VE3BNH 160.

Amateur Extra

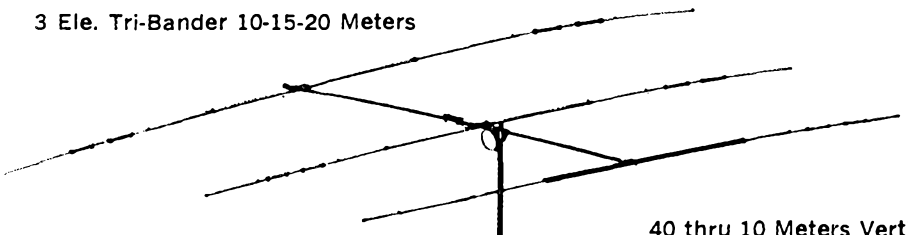
(Continued from page 72)

ual on remote control methods of model planes or model boats.

Good luck. It's not as hard as it sounds. As a matter of fact, it's fascinating and absorbing work. Call the FCC examination point nearest you. Make a definite date at some time in the near future, so you will not procrastinate, and get to it. I don't think that any General with at least two years of experience, plus study using the hints I have just suggested, can fail to pass the Amateur Extra at least his second try. Have fun. QST

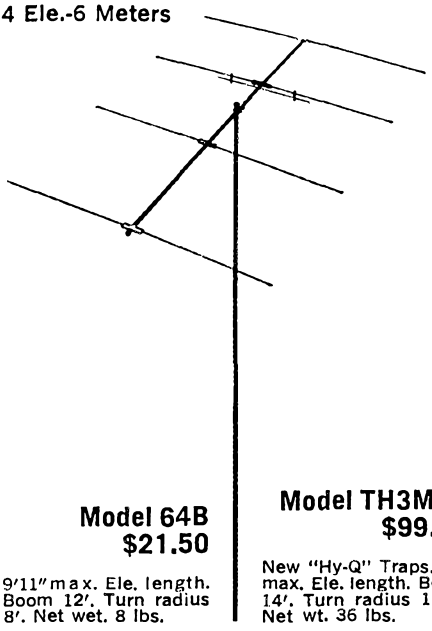
HY-GAIN ANTENNAS IN STOCK AT HARVEY'S

3 Ele. Tri-Bander 10-15-20 Meters

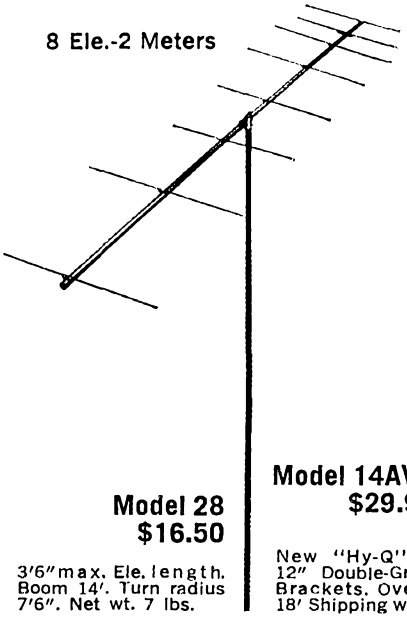


40 thru 10 Meters Vertical

4 Ele.-6 Meters



8 Ele.-2 Meters



Model 64B
$21.50

9'11" max. Ele. length. Boom 12'. Turn radius 8'. Net wet. 8 lbs.

Model TH3MK2
$99.75

New "Hy-Q" Traps. 28' max. Ele. length. Boom 14'. Turn radius 15.7'. Net wt. 36 lbs.

Model 28
$16.50

3'6" max. Ele. length. Boom 14'. Turn radius 7'6". Net wt. 7 lbs.

Model 14AVQ
$29.95

New "Hy-Q" Traps. 12" Double-Grip Mast Brackets. Overall ht. 18' Shipping wt. 10 lbs.

For a ham-to-ham talk on all your needs, come to Harvey — midtown New York's leading ham center — and see:

Roy-W2CF Celso-PY4EH Richard-WA2FBH Elliot-WA2HDP Bert-K2IBK Anton-W2KWY Leo-W2LJA Jack-W2LZX Ron-WN2MZI Jerry-WB2NUZ Abe-W2QOA Harold-K2QOP Jerry-K2QPC Joe-W2TBJ

HARVEY RADIO CO., INC. OUR 38TH YEAR

103 WEST 43rd STREET / NEW YORK, N.Y. 10036 / (212) JUdson 2-1500

World Above

(Continued from page 99)

and was pinning the meter. This contact was followed by one with K3SZX who runs about 10 watts p.e.p. and whose signal was about 20 over 9. John finished up the day with a contact with K3WTH in Bethesda for his third s.s.b. contact in Maryland. Among other signals heard that day, K1JCC and W2REB were outstanding in Louisiana. From Texas and K5FVR, we hear of a good opening on May 4 when Hal heard the first 2s he's ever heard on 50 Mc. At Houston, K1IGY/WA5KPU writes that there has been little Sporadic E in that area with the exception of several openings to Arizona and California. Rumor has it that a local (Houston) station recently worked an LU station. Dick sez that s.s.b. activity has been picking up and at the present time K5VWW, W5ZNM, WA5HGG and K1IGY/5 are active nightly on 50.110 u.s.b. Thirteen other stations in the immediate area are capable of s.s.b. "Starting on May 1, 1965, K1IGY/WA5KPU will be running a c.w. beacon on 50.100 from 0800 to 1000 GMT every week night and possibly Saturday nights. The power to the antenna is 250 watts and will be beamed NNW. I would appreciate having any stations interested in monitoring the beacon on a regular basis contact me at 4916 Linden; Bellaire, Texas 77101." Good luck, Dick. Wish we were to the NNW of you. It's interesting to note that according to the report of W6IEY at La Mesa, California, a few W5s were heard in California on April 30. "They were weak, but they were in there," sez Lou. On May 2, K5OKF in Oklahoma and WA5TZM on s.s.b. were heard during a 15-minute opening. The 5th of May brought forth WØYYM in Iowa during a 20-minute opening. W6ARQ tells us that more and more stations are going mobile on six-meter f.m. with about a dozen units in Santa Rosa and Sebastopol. John also sez that he's observed only one opening and one station heard, K5QPV in El Paso. Odd thing about the whole thing was that W6ARQ was copying him on the mobile f.m. receiver. Away out there in Oregon, W7GWT mentions an opening on April 18 when he copied VE6OH, W7CNK, K7VNV, K7CAZ and W7AYH all on c.w. and with signals S4 to S5. "Possible aurora from the tone of the signals," sez Chuck. A letter from K8UQA in Cleveland, Ohio is dated May 12 and sez that the band has been open for the last ten days straight with almost all of the 48 states heard. "On the 5th of May the west coast was getting into Cleveland for about four hours and I got a real thrill out of working eight 6s all on s.s.b." Dave recently got on s.s.b. himself so we can understand. He also worked W7YDW and K7TLX in Utah during the same opening. On the 6th VE4HA, VE4GI and VE4RE were worked two-way s.s.b. and VE4MB was worked on a.m. Only stateside station worked was W6HAN in North Dakota, also s.s.b. You believe in working those rare ones, don't you, Dave? Going back to April 30 Dave heard CO5CN, CO2DL and CO2FA plus a few KP4s. Now shall we move back to Ohio, Sam? The Cleveland 50 Mc. DX Club, WA8BCA, is getting ready

MORE POWER!

And you don't have to spend a small fortune ...not if you buy the new CLEGG 22'er

HENRY RADIO SUGGESTS THAT YOU COME IN, PHONE OR WRITE FOR COMPARISONS BETWEEN THE 22'ER AND ANY OTHER TWO METER TRANSCEIVER IN IT S PRICE RANGE. YOU'LL BE GLAD THAT YOU DID. WHILE YOU'RE AT IT . . . WE SUGGEST THAT YOU CHECK THE CLEGG APOLLO 700 LINEAR AMPLIFIER . . . BIG STATION PERFORMANCE ON SIX METERS.

Also ... IF YOU WANT MORE POWER IN THE BUYING DEPARTMENT . . . CHECK INTO HENRY RADIO'S EASY TERMS.

6% FINANCE CHARGE • 10% DOWN OR TRADE-IN DOWN • NO FINANCE CHARGE IF PAID IN 90 DAYS GOOD RECONDITIONED APPARATUS. Nearly all makes and models. Big savings! 15 day trial — 90 day warranty. 90 day full trade back on new apparatus. Write for bulletin.

Henry Radio Stores

CALL DIRECT . . . USE AREA CODE

Butler 1, Missouri	813 679-3127
11240 W. Olympic, Los Angeles, Calif.	213 477-6701
931 N. Euclid, Anaheim, Calif.	714 772-9200
431 E. Green St., Pasadena, Calif.	213 684-0861
6116 N. 27th Ave., Phoenix, Ariz.	602 AM 4-3895

"Worlds Largest Distributors of Short Wave Receivers"

early for the September contest and would like to get skeds set up on six and two meters. Skeds can be made with K8MIMM. Another Ohio station, WA8DFA, reports the auroral session of April 17 and 18 when he worked stations in Wisconsin, New York, Michigan, and Illinois. Not too many seem to have caught this aurora, wonder where everybody was. Looking for skip in every direction except north? W8HFA got in on the 30th and heard stations from Massachusetts to Louisiana plus a 0 or two. One more station reporting the aurora of the 17th is WA9KKA at Wheaton, Illinois who sez he heard all call areas except 6 and 7, and worked 1s, 2s, 4s and 5s and 0s. KL7EBB/9, W9RSV and WA9FIH all caught the opening of April 28 and agree that 5s from Texas were predominantly heard. Jim (WA9FIH) reports openings on April 5, 13, 17, 26, 28 and 30. From Indianapolis, WA9ASZ reports that band conditions have improved markedly. "Toward the end of the month skip was coming in every day and from this QTH we could hear all areas except the 6s." WA1BWF/9 at Milwaukee observed openings on April 13 to Florida and Georgia and on the 28th to Texas. Ray also mentions the aurora of the 17th but gives no details. He would like some 50-Mc. scatter skeds during October, November and December and can be written to at 309 Front St., Chicopee, Mass. 01013 before October 1. In Minneapolis K0OST caught both the auroral session of April 18 and the "first real opening on April 30 when I worked Mississippi, Georgia and Louisiana and heard stations in all states from Georgia to Texas, Tennessee to Florida." During the aurora Jim heard Illinois, Indiana, Wisconsin and Nebraska. KØFKJ at Dell Rapids, South Dakota, heard his first opening of the season on the 28th when he worked stations in Texas. On the 30th Ray heard stations in Texas, Mississippi, Louisiana, Florida and Alabama within a half-hour period.

QST

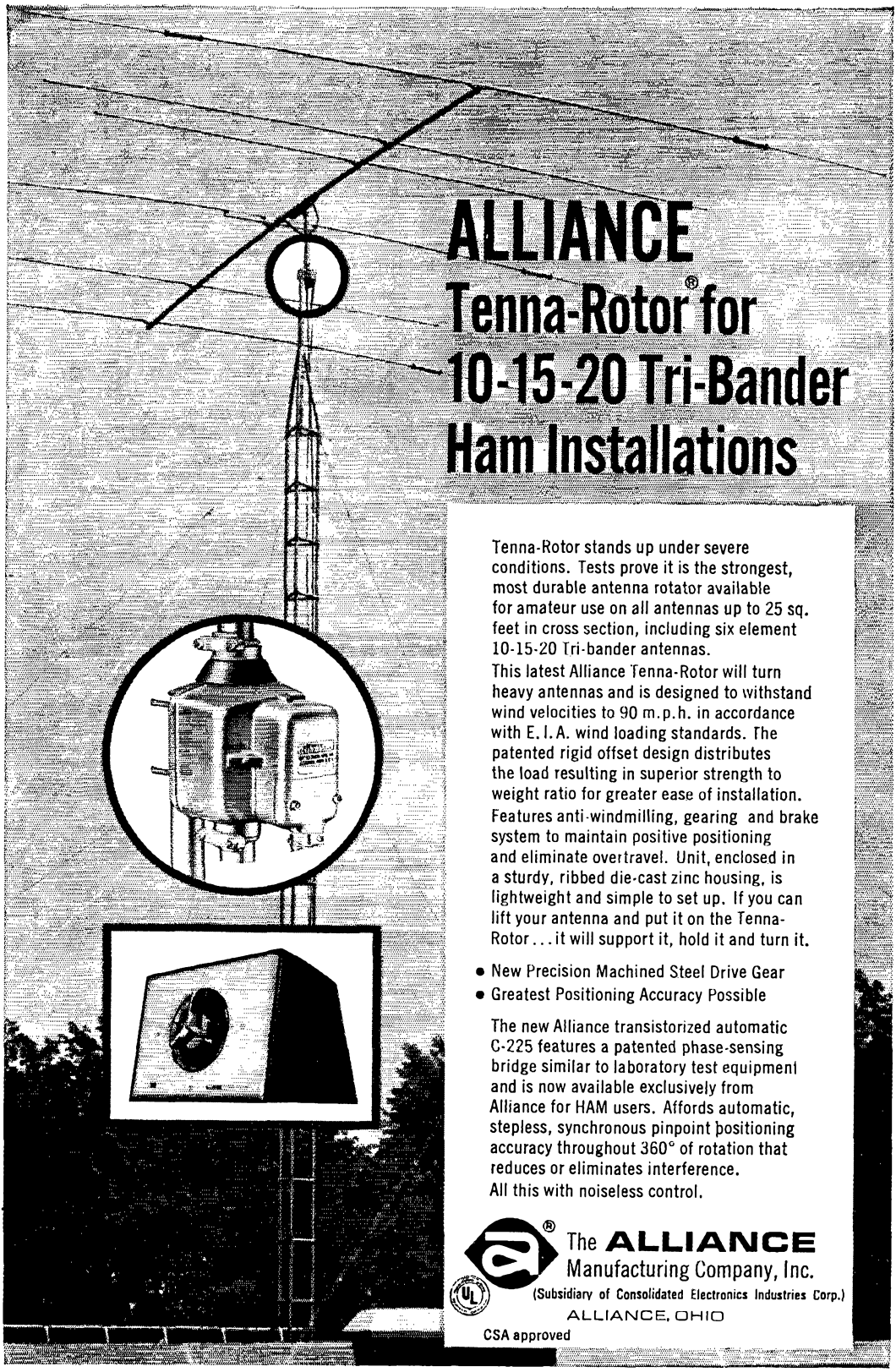
How's DX

(Continued from page 95)

K1QGC . . . . . "I hope to remain in Kenya for a while," writes G2BPC as 5Z4IR . . . . . K1QHP of ET3USA and FL8AK aims for Andorra in '66 if his future transfer to Germany goes through on schedule . . . . . "During the months of June and July I hope to operate 14-Mc. c.w. and s.s.b. from Liberia," notities K1ZFX. Bob holds the calls EL2C and DJØMF.

OCEANIA — KH6IJ, Mr. Contest and DX out his way, will spend the summer in Philadelphia and then mobile his way westward across the continent . . . . . "I QRTd for a month while building a new SB-300 and SB-400," discloses K3SWW/KG6. Conrad enjoyed a visit from ex-9M2JJ who stopped in on his way back to Michigan after a Peace Corps tour . . . . . "K7QOL will be mobile and portable as VK2KJ for about three months," announces K7RJK. "This will take him, among other places, to rare VK8-land." . . . . . Ex-ZL1ABZ-ZL4JF, with the help of ZL2GX, lined up a KWM-2, 75S-1, 32S-1, G2DAF linear, dipoles and a 3-element 20-meter beam for his Maytime multiband Chathams attempt. A.c. mains don't run 24 hours a day there, a deterrent to any rabid DXpeditioner . . . . . "I hope to have my VK license in the very near future," writes ex-VR2BC, "and then I'll get some sort of rig with which to make a noise. My nine years in Fiji were most rewarding radiowise. I've made many friends who I hope will not mind having to sort me out of the VK hordes.

EUROPE — TF2WJA (K1YLD) identifies current U. S. personnel in Iceland as follows: TF2s WIG (K3KLC),



ALLIANCE Tenna-Rotor® for 10-15-20 Tri-Bander Ham Installations

Tenna-Rotor stands up under severe conditions. Tests prove it is the strongest, most durable antenna rotator available for amateur use on all antennas up to 25 sq. feet in cross section, including six element 10-15-20 Tri-bander antennas.

This latest Alliance Tenna-Rotor will turn heavy antennas and is designed to withstand wind velocities to 90 m.p.h. in accordance with E. I. A. wind loading standards. The patented rigid offset design distributes the load resulting in superior strength to weight ratio for greater ease of installation.

Features anti-windmilling, gearing and brake system to maintain positive positioning and eliminate overtravel. Unit, enclosed in a sturdy, ribbed die-cast zinc housing, is lightweight and simple to set up. If you can lift your antenna and put it on the Tenna-Rotor . . . it will support it, hold it and turn it.

- New Precision Machined Steel Drive Gear
- Greatest Positioning Accuracy Possible

The new Alliance transistorized automatic C-225 features a patented phase-sensing bridge similar to laboratory test equipment and is now available exclusively from Alliance for HAM users. Affords automatic, stepless, synchronous pinpoint positioning accuracy throughout 360° of rotation that reduces or eliminates interference.

All this with noiseless control.

The ALLIANCE Manufacturing Company, Inc.
(Subsidiary of Consolidated Electronics Industries Corp.)
ALLIANCE, OHIO

CSA approved

WIH (K3UKV), WIJ (K1QFT), WIM (W6JZB), WIO (K8EVS), WIP (WA2DIU), WIR (K3SWC), WIT (K4TFO), WIV (WB2NRV), WIW (WA1EYR), WIX (WA9JWR), WIY (WA5FLP), WIZ (K3KCW), WJB (WA2PXM), WJE (WA6JQN), WJF (W1PVD) and WJG (K3RFY). "The list is not complete," Doug admits, "but is the best I could do on my last trip to Keflavik." . . . . . On business jaunts to Ohio G5LC enjoys visiting K8s GOP ZNC and other Toledo amateurs. Leslie is in the landwire game . . . . . ZB2A tells W8FJK that ZB2s AG AI AJ AL and AM will be QRMing each other before long, and that ZB2AI departed Gibraltar in May. ZB2s AJ and AK will try single sideband . . . . . DJs 6SI 7LQ and 8GN displayed DJ6SI/LX/p in the European Field Day, June 12th-13th. DJ6SI scored some 5000 contacts with 75 countries as LX3BD in 1964 . . . . . Don't forget the 11th European (WAE) DX Contest set for the 14th-15th of next month (c.w.) and September 11th-12th (phone). Participation particulars next *QST* . . . . . OH0s BH BQ BS and SB will put OH2AM/OH0 on the air from the Alands on the 18th-27th of this month with a variety of equipment. Watch sideband spots 3790, 7070, 14,125, 14,210 and 21,350 kc., as well as c.w. frequencies 3505, 7005, 14,010 and 21,010 kc. . . . . W4HOS calls attention to the XYL-OM DX doings of Hs MAH and PPI. The latter is DXCC but still needs a few QSLs to clinch his WAS.

HEREABOUTS — "Wonderful conditions in VE8-land," enthuses VE7BFN/VE8. "I'm located at a weather station at 65°N-110°W. In my first three weeks here I worked 152 countries on 20 meters. Twenty has been open about 20 hours a day. I use an SR-160, homebrew 700-watt linear and a 4-element beam." But don't rush up there, fellows, unless you're dressed for minus 40 degrees . . . . . WN2PFD reached the 39-country mark on 21 Mc., not bad at all for a Novice at this stage of the solar cycle . . . . . WB6KVA wonders why all the CQ-DX shouting by W/Ks on 40 c.w. when the band is already filled with good stuff. Lots of us have been stumped over that one for years, Greg . . . . . K5JVF, Oklahoma's gift to 160, 80 and 40 c.w. DX doings, is swapping his flagpole vertical for a 75-foot windmill tower. Next season you easterners watch out! . . . . . OX3WX answers lots of W/K/VEs on 80 through 15 meters, c.w. or s.s.b. . . . . WA6WTD notes that K5YAA/VO1 scored 8000 contacts with 167 countries, just about evenly divided between s.s.b. and c.w. K5YAA also notched 800 QSOs with 72 countries as TF2WIU. QST

Hamfest Calendar

(Continued from page 79)

Tennessee — The Oak Ridge Radio Operator's Club will sponsor the Annual Crossville Picnic at Cumberland Mountain State Park July 17, 18. For information write The Oak Ridge Radio Operator's Club, Inc., P.O. Box 291, Oak Ridge, Tenn.

Vermont — The Burlington ARC will once again sponsor the annual International Field Day Hamfest, July 4 at Champlain Valley Fairgrounds in Essex Jct., Vt. W1HRG is chairman.

Virginia — The 2nd annual Tidewater Hamfest, July 24, will be held at Lakewood Park, Norfolk, Virginia starting at 10 A.M. Further details from TARC, 314 Maycox Ave., Norfolk, Va. 23505.

Wisconsin — The WNA Picnic will be held at Neenah on July 11.

Wisconsin — The Wisconsin Nets Association will hold their annual picnic on July 11, at Jefferson Park in Menasha, Wisconsin. Registration begins at 10:00 A.M. Registration is $1.25 a person or $2.25 for a family ticket. Refreshments will be served but bring your own lunch. Fishing and swimming available. Information from K9AGT, 4609 Keating Terr., Madison, Wisconsin.

Wyoming — The Wyoming annual Hamfest on Casper Mountain will be held on July 3 and 4.

The Post Office Dept. promises faster mail service with the new Zip codes. Use yours when you write League Headquarters. Use ours, too. It's 06111.

"My Father says all soldering guns are not the same..."

"How many have detachable tips (fine, medium, heavy duty) that deliver heat power ranging from 25 to 450 watts?

"How many are versatile enough to do delicate printed circuitry work, T.V. and radio repair, *and* heavy duty chores (like repairing radiators and downspouts)?

"How many have ATR*?

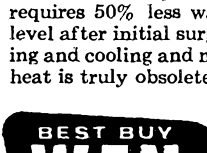
"*None*—except the new WEN 450 (one gun, three tips, a thousand and one soldering projects)."

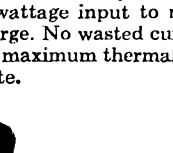
*Automatic Thermal Regulation, exclusive with WEN. Utilizing a high temperature magnet wire, ATR delivers the precise amount of heat power to each tip so that it may do its job—yet requires 50% less wattage input to maintain a constant heat level after initial surge. No wasted current, instantaneous heating and cooling and maximum thermal control. With ATR, dual heat is truly obsolete.

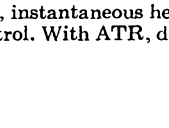
$13.95
(includes heavy duty tip)
Light duty tip $1.30
Medium duty tip $1.30
Plastic cutting attachment .60
Flat Iron attachment .60

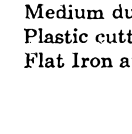
BEST BUY WEN FOR YOUR MONEY

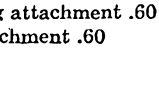
PRODUCTS, INC.
5810 Northwest Highway
Chicago, Illinois 60631


Model 909
"All Saw"


Model 808
2-Speed Drill


Model 940
Sander/Polisher


Model 930
Electric Plane


Model 910
Belt Sander


7 Solder Guns
and kits

NTS Managers (see page 77)

1) WØLGG. TEN manager, has been an active traffic handler for many years as evidenced by her sixth ranking on the Post-War BPL honor roll. Since she took over in 1964, Bertha has been building up TEN with more representation and traffic.

2) WØHXB, TWN manager, may be familiar to some of you as W4UGI or W3JWN. Pete took over as manager in 1962.

3) The next young man is W8CHT 8RN manager since 1962.

4) WB6JUH, PAN manager, has been doing a bang-up job since he took over in 1963. Johnny is no novice at the game either. Before moving from K4APK, he was the Central Area TCC Director.

5) W1BVR, 1RN manager, has had his post since the birth of NTS, and is the only original manager still on the job. Perce has served as Director and Vice-Pres. of the League and is currently the W. Mass. SCM.

6) W9QLW 9RN manager, is another of our old timers who received his manager appointment in 1963.

7) K3MVO, 3RN manager, was first licensed in 1925 and has been active ever since. Pres is one of our newer managers, having taken over the reins in 1964.

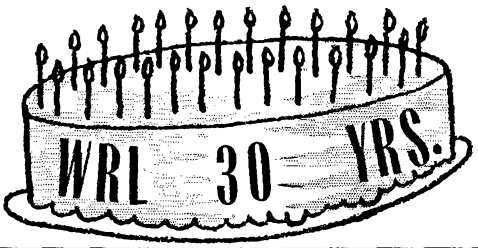
There you have them, seven of our most prominent NTSers. We hope to present the rest, if we can get pictures of them. QST

IARU News

(*Continued from page 49*)

OSCAR PRACTICE

Preparation for future participation in the space communications activities of Project Oscar is made easier by the operation of a number of v.h.f. beacons by several IARU Societies. From the Region I Bulletin comes the following list: LA1VHF, Mount Yausta, 144.15 Mc.; LA2VHF, Trondheim, 145.2 Mc.; LA3VHF, Harstad, 145.25 Mc.; OE7IB/P, near Innsbruck, 144.15 Mc.; ZE1AZC, near Salisbury, 50 Mc.; GB3CTC, Pedruth, Cornwall, 144.100 Mc.; GB3VHF, Wrotham Kent, 144.500 Mc.; OH3VHF, Ylojarvi, Finland, 144.929 Mc.; SM4UKV, 20 km west of Orebro, 145.0 Mc.; DLØSG, Straubin, 145.9 Mc.; OZ1GY, Copenhagen, 149.98 Mc.; GB3GEC, Hammersmith, 431.008 Mc.; DLØSZ, Munich, 432.008 Mc.; OZ1GY Denmark, 432.018 Mc.; and GB3LER. Lerwick, Shetland Islands, 145.995 Mc. The appropriate national societies are interested in receiving reports on reception of these beacon stations. QST



ANNIVERSARY SALE

POSITIVELY THE BEST TRANSCEIVER BUY EVER OFFERED THE AMATEUR . . .

GALAXY III

REG. PRICE $349.95 . . . NOW ONLY

$299.95 SAVE **$50.00!**

USE WRL'S CHARG-A-PLAN—JUST $15 MONTHLY

Now! . . . *CASH SAVINGS OF $50.00* on the *POPULAR GALAXY III TRANSCEIVERS*. 300 WATT PEP SSB/CW-FULL BAND COVERAGE on 80-40-20 meters. AMAZING 6 Xtal filter gives you the BEST SELECTIVE RECEIVER on the market. UPPER and LOWER selectable SIDEBAND.

Act now . . . **2 WEEK FREE TRIAL*** and *NO DOWN PAYMENT CHARG-A-PLAN.*

WRL'S PREMIUM TRADE-IN ALLOWANCES ALSO APPLY. Take advantage of the GREATEST BARGAIN ever offered on TRANSCEIVERS.

*Send for FREE TRIAL TERMS.

SAVE $80.00 on our MOBILE PKG.

PLUS DON'T MISS THIS . . .

DC SUPPLY . . . REG. PRICE $119.95

NOW JUST **$89.95** (YOU SAVE $30.00)

SPECIAL PURPOSE VFO covers MARS, CAP etc. . . . $89.95 write for details

BUY *GALAXY III & DC P.S.* MOBILE STATION FOR ONLY $389.90

ONLY $20.00 MONTHLY

HURRY! THIS PRICE LIMITED TO OUR SUPPLY ON HAND

WRL

WORLD RADIO LABORATORIES
3415 West Broadway
Council Bluffs, Iowa 51504

LEO I. MEYERSON
WØGFQ
PRESIDENT

WORLD RADIO LABORATORIES
3415 West Broadway Council Bluffs, Iowa 51504

- ☐ Send details on Free Trial Offer.
- ☐ Ship Galaxy III—$299.95.
- ☐ Ship "Mobile Pkg. III" —$389.90.
- ☐ Send catalog and Reconditioned Listing.
- ☐ Send quote on gear on attached sheet.

Name_____ Call_____

Address_____

City_____ State_____ Zip_____

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. **An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate.** Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking-copies can be supplied.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

SAN FERNANDO Valley Radio Club 9th Annual Hamfest—Picnic, Sunday, July 11th, Sunset Farms, 16303 Foothill Blvd., San Fernando. Color TV, swimming, contests, kiddie rides, fun for family. Donation one dollar. Attn: ARRL National Convention visitors, drop by on way home. Tickets, maps, info: K6UMV, c/o W6SD Hamfest, Box 3151, Van Nuys, Calif.

PEORIA Hamfest September 19, Exposition Gardens, Peoria Area Amateur Radio Club, advance registration $1.00 until Sept. 11, Ferrel Lytle, W9DHE, 419 Stonegate Rd., Peoria, Ill.

DARA Auction July 17/65, 11:00 A.M. at Island Park, Hellena and Riverside, Dayton, Ohio. Small charge for consignments and trunk sales. Contact K8REG, Vince Varnass, 4329 Renwood Dr., Dayton, Ohio 45429

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCQ, Ralph Hicks, Box 6097, Tulsa, Okla.

WANT Callbooks, catalogs, magazines, pre-1920 for historical library. W4AA Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

WANTED: All types of aircraft on ground radios. 17L 618F or S388, 390, GRC, PRC, 51J RVX, Collins linear amplifier, Type 204; Especially any item made by Collins Radio, ham or commercial. Also large tyne tubes and test equipment in general. For fast cash action contact Ted Dames W2KUW, 308 Hickory, Arlington, N.J.

SELL swap or buy ancient radio set and parts magazines. Laverty, 118 N. Wycombie, Lansdowne, Penna.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 17, Binghamton, N.Y. Tel: 724-5785

SAVE On all makes of new and used ham equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts; 617-598-2530 for the gear u want at the price u want to pay.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, 118 S. Clinton, Chicago 6, Ill.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

WANTED: Collins Parts, BC-610, GRC-27, Autodyne, Bethpage, L.I., N.Y.

POWER Transformers rebuilt, 30 years experience, save. Kerla, 950 Metropolis, Marine City, Michigan 48039.

INTERESTING Offers galore in the new combined "Equipment Exchange-Ham Trader". Next 12 issues $1.00. Sample free. Brand, Sycamore, Ill.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., P.O. Box 516, 199 Front, Hempstead, N.Y.

ELECTRONIC Tubes Top Brands Sold at substantial savings! (Minimum Order $15.00). Authorized GE, Amperex, Dumont & Eimac Distributor. Send for Free Buyers' Guide for all your Tube Requirements. Top Cash Paid for your excess inventory (New Only-Commercial Quantities). Metropolitan Supply Corp., 443 Park Avenue South, New York, N.Y. 10016. 212-MU 6-2834

QSLS? WPES? Personalized made-to-order! One-day service! Largest variety samples, 25¢. DeLuxe, 35¢. Sakkers, W8DED, Box 218, Holland, Mich.

QSLS, samples 20¢. QSL Press, Box 281, Oak Park, Illinois 60303.

QSLS "Brownie" W3CJI, 3111 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

C. FRITZ says, thanks to the hundreds of friends who sent get-well messages the four months he spent in hospital. Progress is good. See ya next month.

PICTURE QSL cards of your shack, etc. Made from your photograph, 1000, $14.50. Also unusual non-picture designs. Samples 20¢. Raum's, 4154 Fifth St., Philadelphia, Penna. 19140.

QSLS-SMS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo 1, Ohio 43601.

DELUXE QSLS, Petty, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

QSLS. See our new "Eye-Binder" cards. Extra high visibility. Samples 25¢. Dick, W8VXK, 1994 N. M.-18, Gladwin, Mich.

QSLS, SWLs XYL-OMs (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fatabulous, DX-attracting, prototypal, snazy, unparagoned cards (Wow!), Rogers KØAAB, 961 Arcade St., St. Paul 6, Minn.

DISCONTINUING QSL Printing. Prices reduced to use remaining card stocks. Send for samples, prices. Gariepy, 2624 Krocmer Road, Fort Wayne, Indiana .

CREATIVE QSL Cards—25¢ for catalog, samples, 50¢ coupon. Personal attention given. Wilkins Printing, Box 787-1, Atascadero, Calif. 83422

QSLS, 100 for $3.00, 28 new drawings. Samples 10¢. Brigham, Colson St., North Billerica, Mass.

QSL, SWL, cards that are different. Quality card stock, Samples 10¢. Home Print, 2416 Elmo Ave., Hamilton, Ohio.

QSLS Distinctive samples dime. Volpress, Box 133, Farmingdale, N.Y.

DON'T Buy QSLS until you see my free samples. Bolles, W5OWC, Box 9363, Austin, Texas.

QSL, SWLS, WPE. Samples 10¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS. 18 sharp samples, 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

PICTURE Of yourself, home, equipment, etc. on QSL cards made from your photograph, 250, $7.50 or 1000, $14.99 ppd. Samples free. Write to Picture Cards, 129 Copeland Ave., La Crosse, Wis. 54603.

ZIP Code Rubber Stamp. Call, name, address, with ink pad. $1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 73, Hobbs, New Mexico (formerly Bellaire, Texas).

QSLS. Samples 25¢. Rubber stamps; name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis, Mo. 63118.

QSLS 300 for $4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill. 60041.

QSLS 3-color glossy, 100, $4.50. Rutgers Vari-Typing Service. Free samples Thomas St., Riegel Ridge, Milford, N.J.

QSLS Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 15¢. Agent for Call-D-Cal decals K2VOB Press, 31 Argyle Terrace, Irvington, N.J.

QSLS $2.50 per 100. Free samples and catalog. Garth, Box 51Q, Jutland, N.J.

3-D QSL Cards have that prestige look, with glittering colors and metallics in raised space-age designs fused to brilliant plastic finishes. Cost so little more than mere mediocrity! Samples 25¢ (refundable). 3-D QSL Co., Monson 2, Mass.

QSL Specialists. Distinctive Samples, 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago, Illinois. 60639.

QSLS-100 3-color glossy $3.00; silver globe on front, report form on back. Free samples. Rusprint, Box 7575, Kansas City, Mo. 64116.

AT Last! Something new in QSL cards! All original designs. Send 25¢ for samples to Yarsco, Box 307, Yorktown Heights 1, N.Y.

CUSTOMIZED QSLS with your autographed photo. Dime brings sample. Pic-Ur-QSLs, Rice Lane, Baltimore, Maryland. 21207.

RUBBER STAMPS $1.00. Call and address. Clint's Radio W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS New cartoons. Top quality, fast service. Samples 20¢. Ed's Press, 3232 Le Moyne, Chicago, Ill. 60651.

QSLS. Gorgeous rainbows, cartoons, etc. Top quality! Low prices! Samples 10¢ refundable. Joe Harms, WA4FJE, W2JME Edgewater, Fla. 32032.

PLASTIC Holder frames and displays 20 QSL cards, 3 for $1.00 or 10 for $3.00. Prepaid Tenabco, Box 198, Gallatin, Tenn.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS: Quality with service. Samples Free. R. A. Larson, Larson Press, Box 45, Fairport, N.Y.

QSLS. 18 samples, 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS. WA6QAY Press, Box 17112, San Diego, Calif.

QSLS. $2.00 per 100 postpaid. Free sample. Hobby Print Shop, Umatilla, Fla. 32784.

QSLS-SWLS. 2 & 3 colors, 100 for $2.00. Samples dime. Bob Garra, Leighton, Penna.

QSLS-SWLS. Special types, photo, art and standard. Samples 10¢. K. Kidd's, RD #1, Telford, Penna.

QSLS, YLRL specials, OMs, engraved badges, reasonable. Samples 10¢. W2DJH Press, Warrensburg, N.Y.

ATTRACTIVE QSLS: Guaranteed largest variety of individual samples (25¢ deductible). Paul Levin, K2MTT, 1033 Utica Ave., Brooklyn, N. Y. 11203.

"GOLDEN Call" QSLS (Only QSL) crafted by Samco for 1965. Sample 10¢. Samco, Box 203, Wynantskill, N.Y. 12198.

QSLS, Gorgeous Rainbows, cartoons, etc. Top quality! Low prices! Samples 10¢ refundable. Joe Harms, WA4FJE, W1GET. Mystery Hill, No. Salem, N.H. 03073.

QUALITY QSLS, new designs monthly. Samples 10¢, 25¢, 50 Savory, 172 Roosevelt, Weymouth, Mass.

QSL Cards: free samples, catalog 20¢. Knight Printing Co., 1550 Downey, Indianapolis, Ind.

HUNDRED QSLS: $1.00. Samples, dime. Meininger, Jesup, Iowa.

QSLS. 18 samples, 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS, YLRL specials, OM's, engraved badges, reasonable, samples 10¢. W2DJH Press, Warrensburg, N.Y. 12885.

ATTRACTIVE QSLS: Guaranteed largest variety of individual samples (25¢ deductible). Paul Levin, K2MTT, 1033 Utica Ave., Brooklyn, N.Y. 11203.

QSLS. Large selection, including photos, rainbows, glossy stocks, cuts, etc. Fast service. Samples, dime. Ray, K7HLR, Box 1176, Twin Falls, Idaho, 83301.

3-LINE Rubber stamp or 1000 address labels. Only $1.00. Betty Harms, W1JWW, Mystery Hill, No. Salem, N.H.

CANADIAN Amateurs: Collins fixed and mobile combination, KWM-2, 30L-1, 312B-5 console, 516-F and MP-1 supplies, plus 351-D mobile mount. Cost over $3,300. The lot: $2,300 cash. C. Thomson, 213 Gordon Ave., Montreal 19, P.Q.

CANADIANS! Complete station for sale: SX-117, DX-60, Johnson Courier amp., Dow-Key relays, tuner, prefer sale as package but write for individual prices. VE3EGG, Ernest Crump, 64 Barrie St., Galt, Ont., Canada.

CANADIANS: Sell Hallicrafters SR-160 SSB transceiver with PS-150-120 A.C. supply. $485.00; National NC-109 eleven tube general coverage receiver, $125.00. VE5NI, Box 28, Carrot River, Saskatchewan P., Canada.

LOOKING? Shopping? Trading? Trying to save money? Write Bob Graham for special deals on new and reconditioned used gear. Cash or Budget. Graham Radio, Dept. A, Reading, Mass. 01867. Tel: 944-4000.

WILL Buy pre-1925 QSTs, etc., etc. State condition and price. W6ISQ, 45 Laurel Ave., Atherton, Calif. 94025

WANTED: For personal collection: QST, May 1916, W1CUT, 18 Mohawk Dr., Unionville, Conn.

TUBES Wanted. All types, highest prices paid. Write or phone Lou-Tronics, Inc., 74 Willoughby St., Brooklyn 1, N.Y. 11021. Tel. UL5-2615.

ACT Now!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

COLLINS Amateur equipment bought, sold and serviced. Paul A. Reveal, W2DC, 129 Midland Ave., Glen Ridge, N.J.

WANTED: Tubes, all types, write or phone W2ONV, Bill Salerno, 243 Harrison Avenue, Garfield, N.J. Tel. GArfield Area code 201-471-2020.

CASH For Your Gear. We, buy sell and trade. Send for free bargain list. H & H Electronic Supply, 506 Kishwaukee St., Rockford, Ill.

FOR Sale cheap QSTs or COs, any quantity. Send your list for quotation. Cash for Callbooks before 1942. Want early radio gear and publications. Erv Rasmussen, Box 612, Redwood City, Calif.

WANTED: 60 ft. crank tower wind load 10 sq. ft. W2UGM, 66 Columbus, Closter, N.J.

WANTED: FR-2409 bandpass filter. State price. Pete Chamalian, W1BGD, 111 Buena Vista Road, West Hartford, Conn. 06107.

DXER Beware: A real bomb. York 5000 transmitter, 1 kw. using 4-1000A, bridge power supply, vacuum tuning condenser. Size 33" wide, 24" deep, 6 ft high. Further details. Bill Brown, WØSYK, 28 Marine Lane, Hazelwood, Mo. Tel.: HEmpstead 4-5440.

CASH For Callbooks. U.S. Government Amateur Callbooks wanted. W8EF, 801 Lakeshore, Grosse Pointe 36, Mich.

WANT: Antnena Couplers CU-286/FRR, R-391 receivers; R-278-B/GR receivers, Shepherdheim, Box 183, Millinocket, Me.

VIKING Kilowatt. No desk. $600. You haul it. James Ney, 228 North Poplar St., Elizabethtown, Penna. 17022.

FOR Sale: KWM-2 p/s, $800; 312B-5 console, $200; mobile p/s 12v, brand new in carton, $150. SMI mic, $20; complete package for $1100. Call-write: Albert J. Bertolisi, 382 Fulton St., Farmingdale, L.I., N.Y. Tel: 516-CH9-0923.

FOR Sale: Certified check only! In excint condx, (with all schematics, manuals, inc. conversions). B&W low-pass filter/1 kw, $15; Hustler mobile antenna/80, $20; bumper mount, $10; DKC-TRP aut. T/R switch, $25; VX-1 Electronic Voice control, $25; HOx HP-23 a/c p/s 117v, $55; HP-13 d/c p/s, 12v, $35; HW-12 80 SSB xcvr, $150; SB-10 SSB adapter, $80; DX-100B/SSB xmtr, $150; TA-33 Triband beam (unpacked), $100. Totals $665. Package deal: $650. Stanley B. Eyre, K1LZA: Hard Hill Rd, RFD 2, Woodbury, Conn.

TBS-50-D 7-band Harvey-Wells xmtr, $45; BC-348-L, $35, including AC supplies. Bill McNally, W8DXR, 5452 Gratton Ave., Cincinnati 37, Ohio.

LOUISIANA, BC-610 kilowatt RTTY, AM and CW, less accessories. Sell or trade for smaller transmitter like Ranger, Navigator, etc. Mac, K5MVN, 113 Woodcrest, New Iberia, La.

FOR Sale: Complete amateur radio station, SSB/AM/CW; HT-37, $260; Drake 2-A, $150; TA-33, Jr and AR-22 rotor, $50 or complete station, coax, relays, Q-mult., SWR bridge, etc. $475. You ship. K4MFP, 815 Burnley Rd., Charlotte, N.C. 28210.

CLEANING Out magazines QST, CQ, PE, many other titles. W3TVA.

LOOKING For a bargain: NCX-3, NCX-A, XCU-27. $327.95, with manuals. Recently factory realigned. W5MRZ, Box 36, Wynne, Arkansas.

COSY Vacation, amateur paradise cabin for two weekly, $50; Livingstone Lodge, Mascoma Lake, New Hampshire. Swimming, Fishing, Boats, Sports, Dartmouth golf, tennis, hot showers, fire places, Light house-keeping, Children half, camp sites, literature, Al Q, Livingstone, W2OPN.

TOWER, Vesto 61-foot with crankover head, mast clamp, thrust bearing, motor plate, wooden platform. Never erected, stored indoors. $475. F.o.b. W3LOS, 138 Chautauqua, Erie, Penna. 16511.

DRAKE TR-3, RV3, AC p/s, like-new with factory cartons. First $500 takes all. W8BQH. Phone 513-791-4685. Cincinnati, Ohio.

RTTY Gear for sale. Write for list. 88 or 44 mhy toroids, five for $1.75 ppd, Elliott Buchanan, W6VPC, 1067 Mandana Blvd., Oakland, Calif. 94610.

CASH. Sony Transistor TVs, etc., swapped for G-R, H-P, L&N, etc. equipment, special tubes, manuals, military electronics. Engineering Associates, 434A Patterson Rd., Dayton, Ohio 45419.

HAM Discount House. Latest amateur equipment. Factory-sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 170 Lockwood Ave., Stamford, Conn.

TELETYPE Machines, converters, R-388, R-390, R-390A receivers, mechanical filters for R-390A (455 IF). Alltronics-Howard Co., Box 19, Boston, Mass. 02101. Tel: 617-742-0048.

APACHE transmitter. In excint condx. $165, plus shipping. K1RSQ.

TUBES, Diodes, transistors wanted. High cash prices paid. Astral Electronics, Box 036, Elizabeth, N.J. Tel: 354-3141.

FOR Sale: DX-100B $125; Western Electric, 34-A, $200; RCO, $25; S-39, $25; Concertone, #1401, $75. Wanted: schematic, controls BC-413-A Dick Haskin, W6KEC, 154 N. McKinley Pl., Monrovia, Calif. 91016.

WANTED: Commercial or military, airborne or ground. Equipment and test sets. Collins, Bendix, others. We pay freight. Ritco, Box 156, Annandale, Va.

SELL: NCL-2000 in factory sealed carton, $525. W8GMO, 6743 Camaridge Place, Cincinnati, Ohio 561-5593.

PARALLEL (2) 4-125As KW amplifier with all power supplies. CW and SSB with your xciter, $80. W9KXZ, 465 S. Edward, Decatur, Ill.

FOR Sale: SP-44 Panadaptor, like new condx, instruction books and cables, $45.00; Gonset G66B receiver and AC power supply, $75; HRO-60T, A,B,C,D coils, NBFM adaptor, spkr, little used, $300; Heath Communications rcvr AR-3, $20; Instructograph AC model, no tapes, $10. Ronnie Tauber, W9QUW, 6035 Cottage Grove, Chicago, Illinois 60637.

COMMAND Receivers .55-1.5 mc and 3-6 mc, $8; 80-meter Novice xmtr, $20; Drake KW TVI filter, $3; antenna current meter, $2; SCR-522 2-meter rcvr, $10; 1350 V 300 Ma, transformer $5; 300 V 100 Ma, power supply, $8. E. Sadler, 23 El Campo Drive, San Jose, Calif.

SWAP My MP-1 for MP-10 even. Sell DX-35, $35. W9WPE.

32V-2, manual, excellent, $100; 75A-1 matching spkr, manual, xclnt condx, $140; homebrew AC, PS 300 watt transceivers, deluxe $30; Advance Relay coax relay, $5; Turner 33X PTT mike, $7; Bargain list components. WØLWZ, 1030 So. Dudley, Denver, Colorado, 80226.

HALLICRAFTERS HT-33B 2KW final, mint condx, but needs final tube: $400. W2WCO, R. Streeter, 9 Popular Pl., Fanwood, N.J.

WANTED: Lafayette HE-35. Bill Westbrook, K3SLP, RD #2, Box 435-C, East Stroudsburg, Penna. 18301.

DESPERATE ham trying for Extra Class needs more tapes for TG-34A or TG-10 Graphic Keyer. 15, 20 and 25 w.p.m. required. Charles C. Hay, WØLCE, 12247 West Ohio Dr., Denver, Colorado 80228.

DRAKE R-4, unopened, $315.00 or 2-B, $195.00. K4LGR, Box 10021, Greensboro, N.C.

SELL: Collins 30L-1, gud condx, used vy little, $350. Gil Chalfant, Rte. 2, Mt. Vernon, Ohio.

HQ-110-C w/speaker, $155; Valiant, $220. Both in xclnt condx w/manuals and original cartons. Will deliver 100 miles. Dr. W. Filche, Jr., 4332-A, Second Ave., Ft. Knox, Ky.

COLLINS: KWM-2 with Q-mult., 516-2 p/s, mobile mount, New-Tronics resonators, 10-80 M. Mike, mint condx, $900 or your best. R. Young, 4500 Conn. Ave., N.W. Washington, D.C. 20008.

SELL: Drake TR-3 transceiver, AC-3 power supply; 12 VDC transistorized supply; TH-4 Hy-Gain beam. Transceiver is like-new, used only 10 hours. Make an offer. Will ship. Fritz Berger, KØTXN, P.O. Box 182, Schleswig, Iowa.

KNIGHT T-60 xmtr, in gud condx, $35.00; V-44 VFO, also xclnt, $25. Ralph Marshall, Box 278, Winter Harbor, Me.

VALIANT, $210.00; HQ-110-C w/speaker, $150. Excint condx w/original cartons and manuals. Will deliver 100 miles. Write 150 Rebecca, Hendersonville, Tennessee.

HAVE You ever been asked to QRS? Learn sending almost immediately or improve, practice, with easily mastered, taped, courses, 3¾ ips; Novice, (0-8 wpm), Advanced (8-18 wpm); $3.85. Both for $6.35. By Altus Recording, 131 S. Penn, Casper, Wyoming.

COMPLETE Rig: Heathkit DX-60, Health baluns, Heathkit HR-10, key, crystals, 80M antenna, ant. relay, JT-30 mike, logbooks, connectors. All in xclnt condx. $175.00. J. Richard Schien, K9ACS, 834 University, Carlinville, Ill. 62626.

FOR Sale: Drake 2-B, $210; Mint, HT-40, $85; Heath Twoer, $35; Knight T-150-A 150 watt xmtr, $95. Doug Trottier, WA1CPQ, 71 McGrath St., Laconia, N.Y. Tel: 524-2278.

WANTED: 35 Mc. mobile or station equipment, transistorized preferred. R. E. Neumann, W5KHX, 75 Thrasher, New Orleans 24, La.

HEATH DX-60, HG-10VFO, antenna tuner, like-new, little used, reasonable. WB2MOI, 16 Raynor Ave., Mt. Vernon, N.Y.

HAM Central for Hallicrafters, Hammarlund, Johnson, National and others. Builders' supplies. Write for list of used equipment bargains. Electronics, Inc., 277 North Santa Fe, Salina, Kans.

HQ-10 VFO, $18; Globe UM-1 50-watt plate modulator w/cover and meter, $19.00. Don, K7SDF, 510 Columbus, Salt Lake City, Utah, 84103.

ANTIQUE Radio Book Collectors! Will trade book "Practical Radio", pub. in 1922 (by Henry Williams) for Vibroplex Bugs. WN8NZH, Rick Chilcote, 706 Johnson Ave., Bedford, Ohio.

COLLEGE: Hornet Tribander, $35, AR-22 rotor, $15, WB2ETF, Box 294, Smithtown, N.Y.

SALE: Viking II xmtr with VFO, SX28A rcvr, also Gonset Bantam beam with rotor and control, all in xclnt condx. $200. W2PCZ, 25 Hope Terrace, Lincoln Park, N.J.

WANTED: SSB gear, antenna, etc. for Jesuit high school in COLLEGE: Hornet Tribander, $35, AR-22 rotor, $15, WB2ETF, Piedras, Puerto Rico 00627, or 39 East 83rd St., N.Y. N.Y. 10028.

FOR Sale: Drake 2B, mint condx. $185. H. R. Tatar, M.D., 13855 Superior, Cleveland (Ohio) 44118.

SELL: 4X250B tubes. New condx. $6.50 each, $10.00 pair. Send check or money order. Will ship parcelpost prepaid in U.S.A. Everett Stidham, Jr., W5JLQ, 722 South 30th, Muskogee, Okla.

SELL: Clegg Zeus, in mint condx, $400; Hy-Gain Thunderbird Tribander perf. condx, $50; Heathkit HO-10 monitor scope, $50; 8-element Telrex 2-meter beam, $20. All items guaranteed perfect working order. Duke Flannagan, W4JEY, Box 293, Aiken, S.C. Phone MI-9-2730.

1-1 Kw Loudenboomer, Mark II amplifier, factory 3000 VDC p/s, manual, mint condx, $285 (all new tubes); 1 Apelco Model AE-76 CM (ship-to-shore) radio telephone, complete heavy duty 115 VAC p/s, harness, manual, microphone, 150 watts output, 8 xtals, marine bands, factory condx, $300; 1 Central Electronics GC-1 gated compression amplifier, manual, mint condx, $25.00; 2 Eimac 4-250A, new, @ $15; 2 Eimac 4-400A, new, @ $20; 4 Penta 4-400A, new, @ $20; 3 Eimac 4-125A, new, @ $15; 4 Eimac 250TH, new, @ $9; 2 Machlett 357-B, used, $15 both; 1 Eimac 4-400A air socket and chimney, $12. H. R. Conley, W5UY, OOTC, 107 Coulee Shore Dr., Lafayette, La. 70506.

ESTATE Settlement: Apache, D-104 mike and coax antenna relay, $135; SX-100 receiver, $100. Dr. C. R. Crosby, RD #1, Chatham, Mass. Tel 432-1157.

SELL Or trade: Four (4) 50-ft. plywood masts, complete with bases, anchors and guys. No reasonable offer refused. Ideal for field day, or build yourself a rhombic. Gene Hubbell, Box 350, RR #4, Rockford, Ill.

SB-33, 4 hours use, perf., in new condx, in carton. Will ship. $250 or your offer. Alan Clammer, Box 2295, HOSP, Andrews AFB, Maryland 20331.

FOR Sale: Complete mobile station, SW-175, HP-13, Hustler whip and mobile mike. All for $190. R. M. Adams, 155 Colony Rd., Newport News, Va.

COLLINS 75A2 with product detector and speaker: $210; Johnson Pacemaker, $135. Both for $325.00. In exclnt condx. Paul Wolfe, W8UGG, 3259 Martin Rd., Dublin, Ohio.

WANTED: 2.1 Kc mechanical filter for 75A-4, W8SSA, Chambers, P.O. Box 62, Bluefield, West Va.

SELL: Collins KWM-2, $740; Collins AC supply, $85; 2 KW P.E.P. final Hallicrafters HT-33B, $395 or all for $1150. Wanted: Portable TV camera. Will pay $150. W2FDU. Tel: 516-FR4-7807. Hewlett, L.I., N.Y.

FOR Sale: RME-6900, $225.00; T-150A, $80; DX-40, $30. Perf. condx. Louis Siciliano, 266 Westbrook Dr., Clifton Heights, Penna. Tel: CLearbrook 9-5387.

DRAKE TR-3, with AC-3 p/s, and RV-3 remote VFO in a like-new condx: $550.00. Mini-Products B-24 Mini-beam with rotator, in exclnt condx. $50. Arthur Zolot, W1SKQ, 82 Rockaway Ave., Marblehead, Mass.

APACHE: In exclnt condx. Calibrated VFO. Drake TV1000LP. Dow-Key DK-602C included $190. Pick-up deal preferred. Tom Wieczorek, 415 Dewey Ave., Saddle Brook, N.J. 07663.

4-1000A linear shielded, metered, 3600 V. 1A supply, $375; PP-813 linear 1 KW DC continuous, $135; 75A-4, $400; GC1A, $80. Perera, K2DCY, 410 Riverside Dr., NYC, N.Y.

FOR Sale: KWS-1, BC-610, 32V-1, and R-388. All in perf. condx, W2ZOL, Dick Walker, 821 University Bldg., Syracuse, N.Y. 13202.

WANTED: Heath HO-10 and HO-13 Scopes; Hammarlund linear, Johnson Matchbox, W3HZ. W. Clark, 207 Fourth Ave., Newtown Square, Penna. 19073.

BARGAIN! Below half-price! Almost new Hy-Gain 4-el. Thunderbird Tribander $59.50. New unused factory-wired Heath IA-1 ignition analyzer $34.50. W8IQ, Benton Harbor, Michigan. Box 242, North Shore Dr.

WANTED: Navy type RCH HF receiver. Geo. Leininger, W8QZF, 16412 Marquis, Cleveland 11, Ohio.

CHEYENNE. Heath Model MT-1 transmitter, never used on the air. $50.00. WA4RHH.

DRAKE 1-A. $125.00. K6LKX, 1833 Cedar St., Hayward, Calif. 94541.

SELL: 1959 RME 4300 receiver, 160 through 10 meters, in gud condx: $70. W8HMT, 1211 Summit Ave., Lakewood, Ohio.

RIDERS Trouble-shooting manuals, 1931: 3; 4; 6 through 19; PA1, Television 1 through 27. Freight collect. Best offer, replies acknowledged. George Schneider, 181 Union Ave., Long Branch, N.J. 07740. W2QOY.

SELL: Collins 75A1 with matching speaker, manual, $169. Consider reasonable offers. WA5ESW, 646 McClendon, Corpus Christi, Tex. Tel: UL-2-1177.

MOBILE Transistorized transmitter power supplies. Outputs from 400 to 600 volts, currents to 500 milliamperes. Ask for Technical Bulletin DE-Q. Silentor Products, Box 298, Rolla, Missouri 65401.

SELL: Cheap for bank check or money-order FB Elmac AF68 and M-1070 supply. Make offer! W8FWB, Box 242, Dover, Ohio.

HONEYWELL W612B transistorized mobile power supplies in original cartons, $20 each. Jim Warren, KØLVC, 4956 Clear Springs Rd., Minnetonka, Minn. 55345.

GONSET mint condx 200W. linear, companion to 6M Communicator III, $81. W8NRS, 2456 Bryden Rd., Columbus, Ohio.

SX-42 wanted. Will pay cash. Must be in gud electrical and physical condition. WA4YFI, Bill Smitherman, East Bend, North Carolina.

SELL: Knight T-150, $75; Hammarlund HQ-110, $130; G-E 6M transmitter-receiver, $20; Sixer, $30; Vanguard 2-meter converter, $10; URC-4 walkie-talkie, $15. Stephen Smith, WA8LMF, 621 M.A.C. Ave., East Lansing, Michigan 48823. Tel: 517-ED2-2496.

APACHE, $125; NC-303, $245. Both are in mint condx. 40 ft. E-Z Way crank-down tiltover tower with ground post, $150. TV rotor, $15. K9DFG, 330 Dolle, Crystal Lake, Ill.

POWER, 4 kilowatts, 115 VAC, gasoline engine. Starter, $195. R. Doege, 710 N. Lake Shore, Chicago, Ill.

HRO-060 A,B,C,D,E,F and AD coils with 2-meter preamp and converter, crystal calibrator and HB product detector and speaker. Will trade for Gonset G-50 late model or make offer. Also MM-2 scope, $75. W. A. McCutcheon, K3HWZ, 124 Orchard Lane, Feasterville, Penna.

ANTIQUE Receivers. Kennedy type 110 Universal receiver, Kenney Type 525 2-stage amplifier, Westinghouse Type DA. Also Wells Gardner Type CWO-46161-A low frequency and BC-314D receivers. In exclnt condx. Make offer any or all. Mrs. Max Morgan, 506 Pittsburg Ave., Fairmont, W. Va.

SALE: SB-300, new, $300. Will wire any kit reasonably, radio, hi-fi, etc. (20 years navy experience, retired). Will repair any of your gear. Lan Richter, 131 Florence Dr., Harrisburg, Penna.

THE Thrill of being DX! Enjoy it in beautiful Antigua. Am returning to England and am offering for $41,000 my 11 room house, completely furnished, including amateur station and antennas, 4 bedrooms, 2 baths, 1 acre, deepfreeze, refrigerator, gas cooker, etc. Ted Ross, VP2AV, P. O. Box 325, St. Johns, Antigua, B. W. I.

FOR Sale: HW-12 and HP-23, $130; 5-4X150A, $8; 1-4CX-1000A, $80; tubes, new, in original boxes. WA2DVU, 211 Toledo, Wildwood, N.J.

VIBROPLEX Champion, $9.00; Hallicrafters TO keyer, $59.00; W9GXR, 173 Wildwood Lane, Wheeling, Ill. 60090.

JOHNSON Viking Kilowatt. The final which includes 500 watts of Class B audio. Many extras. $500. Condx gud. Paul Haus, 25 Upland Dr., Chappaqua, N.Y.

RANGER I with grid-block keying, $125 or make deal for Navigator or HRO-60. W3QCW. H. S. Pettis, 702 Justin Way, Silver Spring, Maryland 20901.

WANT To trade two professional Magnecord M-90 tape decks and one Magnecord M-90 record-playback amplifier for ham gear. Would like a good condx HT-32A or HT-37 xmtr. Marvin C. Zitting, W7MWR, P.O. Box 1813, Salt Lake City, Utah.

GONSET Communicator IV, two meters xtals, mikes and plugs. In gud condx: $218.00. Paul Strezeski, 108 Bruce Circle, Colchester, Conn. W1CUZ.

WANTED: Aermotor tower with flat-top or similar tower. Will pick up. Also Courier. WA8AHG.

FOR Sale: 4-1000A filament transformers 7.5 VCT @ 21 amps, pri 110, 117, 125 VAC 60 cps, fully enclosed unit fits under 4" chassis, net wt. 9 lbs., $12.00. Write us for free estimates on any of your transformer needs. Peter W. Dahl Co., 401 4th St. S.E., Minneapolis, Minnesota 55414.

FOR Sale: VHF rig, used only 6 months. Tapetone Skysweep rcvr with speaker, cost $300. Sacrifice for $190. Heath VHF-1 xmtr, professionally wired and tested, with JT-30 mike and key, $140. Both like new. Also Hallicrafters S-38E, exclnt condx, $25; TR-4 rotor, $15; WRL 6-meter converter, new, unassembled, in original box; $12. Dow-Key coax relay, $5. Carl Stewart, 48 Club Drive, Roslyn Heights, N.Y.

SELLING: Eico 730 modulator, 5-element 6-meter beam, Winegard UHF converter, 6198 Vidicon, 416B 2-meter preamp, ART-28, 220 Mc. Cush Cratt antenna, homebrew (QST, Nov. '62) 432 Mc. SSB and TV xmtr: Int'l Xtal 6-meter Mobilett converter, 78 ft. crank-up tower, Ameco Nuvistor 220 Mc. converter, JFD-UHF antenna, Heath reflected power meter. WB2GKF, Stan Nazimek, 506 Mount Prospect Avenue, Clifton, N.J.

6M Communicator IV, mic, mobile ant., like new, $190; 2M Communicator IV, $220; Polycom 6M, new, $175; 432 Mc. 10-el. beam, $8.00; Instructograph, $20. Wanted: Johnson Matchbox, rotator keyer, John Kakstys, W2FNT, 18 Hillcrest Ter., Linden, N.J.

SELL: HW-22, SSB transceiver with GH12 PTT mike; HP23 power supply, HRA10-1 xtal calibr. Like new condx, works perfectly. $140.00 K4MYY, Box J-1, Greensboro, N.C.

KWM-2 (with Waters Q-Multiplier), 516F-2 (110 volt), MP-1 (12 volt) 351D-2 (Mobile Mount) and 30L-1 (linear); EV-630 and Shure 404-C mikes, all $1600.00. L. Kahan, K2ENC, 60 West Hoffman Ave., Lindenhurst, N.Y. 11757, tel: 516-TU4-3300 (9 AM-5 PM).

TELETYPE, Model 26, table, W.E. supply, manuals, works OK; $40.00; TT-63A/FGC repeater (for receiving RTTY), new, with schematic; $40.00. Partly built TU, 3" CR tube, meter, over $65.00, new parts; $30.00; R.M.E. DB-22A Preselector, clean, works OK; $12.00. Cannot ship, sry; will deliver or meet within 150 miles. K9HHA, 2624 Kroemer Rd., Ft. Wayne, Ind.

SELL: Swan 120, new in June 1963. Used vy little; $130.00. W8CUT, Dan Earks, 1776 Walnut, Coshocton, Ohio 43812.

COLLINS, 1 year old, original cartons, 30L-1 linear, $400; 312B-5, $250.00; MP-1 12VDC p/s and 351D-2 Mobile Mount, $200; Hallicrafters, original cartons P-150 12VDC p/s and Mobile Mount MR-150, $80; Heath MR-1, MT-1, AC and DC p/s, spkr, mike and Mobile Mount $150 or your best offer. Heath factory aligned HW-12, HW-32, HW-22, one mike and AC p/s, never used mobile, $350; Heath Apache, SB-10 Mohawk XC-6 and XC-2 converters, $350. All mint condx, manuals included F.o.b. Tryon, N.C. WA4AEB.

WANTED: Instruction and service manual for RME VHF-126. Anthony Rokosz, 7 Bradford Rd., Valley Stream, N.Y.

B&W 51SB-B wanted, or will sell B&W 5100-B xmtr/exciter $200. K3UXQ, 30 Gragmere Rd., Wilmington, Del. 19809.

COLLINS 75A-4 owners! Don't trade up! Investigate our conversion that makes the 75A-4 a dream. Stankus, W2VCZ, 30 Pitcairn Ave., Ho-Ho-Kus, N.J.

TRANSMITTING tubes, industrial surplus. Free list. C & C Company, Box F, Gardena, Calif.

LINEARS Galore! Kilowatt and otherwise! 80-2 meters. Write S R S Electronics Co., Box 267, Newark, Del.

BEST Offer: Hammarlund HQ-160 with speaker, vy gud condx. A.R.S. W2PLB, Charles Moskowitz, 720 East 32nd St., Brooklyn, N.Y.

SWAN 400, 406-VFO, 117B, AC supply, flawless, w/cartons, manuals, $400. Davis, 675 Sierra Meadow, Sierra Madre, Calif.

2 KW P.E.P. linear amplifier 80-10 using 2-4CX250Bs. Fully metered with Variac controlled HV supplier, regulated bias and screen supply, $200. Drake 2B-2BQ calibrator, $219, 20-A with VFO, $100. Gordon Scallion, 249 Hubbard St., Glastonbury, Conn. 633-2489.

1 KW Linear amplifier, bandswitching 10-80 meters, 4-400A, vacuum capacitor, regulated power supply for SSB, Variac, four meters, extra 4-400A, completely shielded. Only $195. Stuart Cowan, 62 Woodcliff Rd., Wellesley Hills, Mass. 02181.

FOR Sale: Hammarlund HQ-170C, $225; Gonset GSB-100, $245; Gonset GSB-101, $155. All in top condition with manual and factory carton. Bob Wetheraid, W2CZT, 128 Chestnut Hill Dr., Rochester, N.Y. 14617.

COLLEGE! Sell Drake 2-B receiver, $190.00; also Heath UT-1 p/s, $10. Shipped collect. Gari Berliot, K9PBV, 2634 Fairfield Pl., Madison, Wis.

SELL: Gonset G-76, mounting kit, 12 volt DC supply and mike; in exclnt condx, $50 deposit $200 express C.O.D. Bob Palmer, K3MTW, Smethport, Penna.

WANTED: Frequency Converters or plug-ins for 10 Mc electronic counter, any condx. W4EWC, 989 Echles, Memphis, Tenn.

SEND Us your requirements for RTTY material, Model 14, 15, 19, 28, motors, converters, keyers, repeaters, regenerator, transmitter-distributors, power supplies, covers, bases, parts, etc. Send for catalog! Atlantic Surplus Sales, 250 Columbia St., Brooklyn, N.Y. 11231.

GONSET Superceiver, new, with conv., $75; Eimac 6A rcvr, with PSR-AC 116 p/s, $55; Gonset tunable 2 mtr. conv., mobile, $10; Ameco 6 mtr. conv., Nuvistor, $15; Johnson 6 & 2 mtr. conv., new, $40; Instructograph, 10 tapes like new, $35; C-E Model B Slicer, with Q multiplier, $25; Millen 90671 SWR, Bridge, new, $5.00; BC-221 with p/s, $75; Dumont 'scope 208-B, $50; Jackson sig gen. 100 kc to 110 mc (am-fm) micro-vt. output, $40. F. Levine, WA2OEH, 139-10 Cronston Ave., Rockaway Park, N.Y., 11694, Tel GR 4-3327.

SSB Transceiver Gonset 900A. Finco ant. A62GMC 50 ohm. Make offer or trade for HQ-170A VHF or G-910A. Britt, W4GIM, 1500 Simpkins St., Raleigh, N.C. 27606.

HEATH mobile twins, UT1 power supply, large speaker, factory checked. Like new. Never used mobile, $130. NC-109/spkr, used only 4 months, $65. Jerry Holmes, 2711 N.E. 23rd St., Pompano Beach, Fla.

HALLICRAFTERS S-108 with S-Meter, $90 or trade for Clegg 99'er. WB2PZB, Roger DeWitte, E. 62nd Linwood Ave., Paramus, N.J.

PAIR 4-1000A, sockets, filament transformers and blower in 6 ft. rack. Make offer. W1WAI, David Allen, 9 Upland, Burlington, Mass.

SB-34, SB-2LA, SB2-XC, SB2-UOR, SB1-MIC, SB1-MB and Hustler whips. $700 cash or PC-62B or PC-6DC or PC-2DC or 22'er as partial payments. K2PGB, 46 Columbia Ave., Hopewell, N.J.

COLLINS. Must sacrifice KWM-2 SSB transceiver with AC power supply, Collins microphone and all cables, $875. 30L-1 linear amplifier, $375.00. Both like new in appearance and operating condx. Phone R. K. Novak at 703-536-9811 in McLean, Virginia (1432 Laburnum St.).

STEAL! Hy-Gain full-size Triband beam, $35.00; 45 ft. tip-over reinforced tower, $35.00; Johnson Ranger I, $120.00; instruction manuals for both of these items. Beam and tower can be seen at 712 E. Sandusky St., Findlay, Ohio. Ranger is at QTH below, where all inquiries should be addressed. Steve Hart, K8EHD, Apt. 1, 5176-23 Mile Rd., Utica, Michigan.

CUSH-CRAFT A 50-6 beam, Mosley TA-33 Jr., HO-170, Seneca, D-104 mike, Autronic Keyer and bug, Vibroplex bug, Heath Tunnel Dipper, Johnson Directional Coupler and indicator, H. Rhoads, WA4ACG, 14010 N.E. 12th Ave., North Miami, Fla. 33161.

DRAKE 2B, as new, original packing, instruction book, guarantee, integral speaker, ant. coax. First $190. W6IEL, 2890 San Francisco Ave., Long Beach, Calif.

COLLINS KWM-2 with 516F2 p/s, $850; 30L1, $350.00; 351D-2 mobile mount, $65; D-104 mike, $14.00. W1OFE, 10 Mansfield Pl., Darien, Conn.

FOR Sale: Gonset G-50, $225 or trade for Drake 2BF, 2-BQ. Write David McMillin, 13442 Wilson St., Garden Grove, Calif. K6LSS.

SWAN 400; 420; and 117B. Scarcely used and not a scratch. All 3 units absolutely perfect condx. Certified m.o. of $505 takes. I pay the insurance, shipping; will answer all inquiries. J. M. Lobmaster, P.O. Box 546, Inglewood, Calif. 903007.

HEATH Tunnel Dipper, wired and working well, $30.00. No cord. Also: 50 1 PF ceramic capacitors NO30, $10.00. R. W. Campbell, W4KAE, 316 Mariemont Dr., Lexington, Ky.

FOR Sale: Thunderbolt, in exclnt condx, operating as grounded grid and ideal with exciter 100 watts drive. Will restore the original condx if desired by buyer. $275.00. J. Chooljian, K2KRF, (201) 261-5971 River Edge, N.J.

SWAN 400 transceiver, 117B power supply and Swan 406 VFO, also Mosley V4-6 vertical (10 thru 80) antenna with B&W filter, Heath HM-11 SWR bridge and Astatic 10C mike. $495.00. WB6JVS/Ø, 707 McFee, Knob Noster, Mo.

DRAKE 2B, in perf. condx, $200; Lakeshore Phasemaster II with Central Electronics VFO, $130.00. Will pay the postage in Ohio. Dan Siefferlen, 12 West Maxwell Drive, Shelby, Ohio.

SELL: Mosley VPA20-3 20 meter, 3-element Vest Pocket beam, $30; Knight T150A, $70; both in gud condx. Herbert Roeder, K3VMY, 329 Wheatland Ave., Shillington, Penna.

GSB-100 SSB-CW-AM exciter and GSB-101 kilowatt linear, like new. $395 or sell separately. W5LGG, 3802 Ridgeline, San Antonio, Texas.

WANTED: Good general coverage receiver. Gary Simpson, Milton, Kans.

SELL: Complete Collins dream station for SSB and CW. Like new condx. 75S-3, ser. No. 10639; 32S-3, serial 10324; 312B-4 station control; 516F-2 AC supply; 30S-1 linear; Hallicrafters HA-1 T-O electronic keyer; Vibroplex electronic key; Vibroplex Bug key, Heath HO-10 monitor 'scope; Electro-Voice 664 mike and stand; TH-4 Hy-Gain beam; all manuals, cables, factory cartons, etc. About $50 more of many small items. Will sell only as complete station. No trades. Original cost over $3600. Sell for best offer over $2400. Lyle Walters, W9DUE, 1602 Briarwood Dr., Carbondale, Ill.

TR-4, $480.00, AC-3, $66.00, DC-3, $108.00. All factory sealed, never broken. Warranty, naturally. Sell separate. K4LGR, Box 10021, Greensboro, N.C.

APACHE TX-1, condx exclnt, no scratches, with manual, in wooden crate. Only $155. K2EGI.

SPECIAL while the supply lasts! Brand new Hallicrafters SR-150 transceivers, $395.00; P-150 AC supply, $79.00; P-150 DC supply, $79.00; HT-41 linears, $249.00. Large stock new and reconditioned equipment. Write for lists. Henry Radio, Butler, Mo.

FOR Sale: El-Tronics Model PR-6 Geiger counter with manual, $30.00; Heathkit signal generator, model SG-8 with manual, $12.00, plus shipping. WAØJUM, Box 59, Mobridge, So. Dakota.

NOVICE Crystals 80-40 M, $1.05 each. Others, 75¢. Free list. Nat Stinnette, W4AYV, Umatilla, Fla. 32784.

APACHE: Has "Best Radio Modification", 300 watts c.w. 250 watts A.M., $165.00. WA9CGL, 411 S. 19th, Chesterton, Indiana.

SOLDER Problems? New Multi-metal Bonding Alloy: Bonds similar and dissimilar metals: aluminum, brass, copper, cadmium, galvanized, stainless steel, silver and others. Flow temp. 383 deg.; tensile strength 63,460 psi. Solve your bonding problems. Send $3.98 for package solder and complete instructions. Bonding Alloy, Box 201, Redding, California 96002

WANTED: Hy-Gain 18-HT vertical. Have 14-AVS vertical and TH-3 10-15-20 beam for sale. WAØEJF, Walrath, Box 41, Cedar Rapids, Iowa

COLLINS UR-388 rcvr, $375; ART-13, AC, $150.00; Johnson Viking, $95; Globe 680A, $65; Lettine 6 meter xmtr, VFO, Bandspread, $85; Hallicrafters transverter, $125; S36A, $95; S-37, $95; RCA 6 meter FM xmtr, $10; four RCA c-bs, $95; RCA color bar generator, $45. Wanted: Hallicrafters S-22R, Higley 82-L, Main St., Matawan, N.J.

WANT: DB-24A. K3MNJ, 8361 Langdon St., Philly 52, Penna.

DX-100, $89.00; MR-1, $53.00; HP-20, $28.00; Pacemaker SSB xmtr, $135.00; Viking I, $43.00; Johnson VFO, $14.00; 52 ohm coax relay, $8.00, mike, $8.00; Heath VTVM, V1, $11; 14 AVS w/radials, $25.00. WB6JHO, 2311½ W. Ramona Rd., Alhambra, Calif. 91803. Tel: 289-2311.

PRICED To sell: first come, first served: RTTY equipment, Model 28KSR printer, $250; Model 15 with auto LF/CR, $100; brand new 14 typing reperf $85.00; brand new 14 TD, $75.00; rack-mount W2JAV TU with 'scope, $75.00; Collins 75A-4 with .8, 1.5, and 3.1 filters, $375.00; HT-32A, $250.00; GSB-201 2 kw. linear in original carton, $175.00. All equipment is excellent. I have no junk! KØGXL, Mark Holland, 5732 Ovid Avenue, Des Moines, Iowa 50310.

COLLINS SSB station: KWS-1, 75A-4, serial numbers 1250 and 4603, 3 filters, integrated station control with speaker, power meter, antenna relays, clock, and antenna indicator. Table and other extras go too! $1500. Frank Mills, K1FVU, 148 Chalmers St., Springfield, Mass. Tel: ST 3-5173.

RICH, W9JS. The Flying Saucer Man from Mockingbird Hill has finally succumbed to his first love, the banjo. New career demands full-time mobile so selling out everything except KWM-2. Big list. Hurry, moving in August. Richelieu, 419 E. Willow, Wheaton, Ill.

6N2. $85.00; unused 50 Mc. Squalo, $10; 99'er, pair 2E26's, product detector, PTT, $110; Radiart transistor supply 250/500 at 240 Ma., $50.00; 117 supply 600/300 at 750 Ma., $50; Model 19 less case, $110.00. W3BKY, 1681 Bellemead Dr., Altoona, Penna. 16602.

RETIRING to apartment. Complete station HQ-170C, Valiant, Mosley Tribander, all accessories, plus inventory of transformers, chokes, filter condensers, meters, some test gear, transmitting tubes (many Eimacs), many small components. $500 cash and carry deal only, W1RUJ, 103 Beach, Foxboro, Mass.

16 Fiberglass Quad Poles 13 ft 5 in. $4.50 each. Wyner, W1PST, 1. Wyner.

AMECO CN-144 Nuvistor converter and P.S. ground plane free. Best offer over $55.00. Trade? Beam or quad for 10-15-20. Prefer local deal. WB6MQE, Jim Minikel, 317 East Emerson Ave., Monterey Park, Calif. 91754 (213) 280-8202 nites.

SELL: Collins KWS-1 serial 1272, 75A-4 serial 4779, E-Z Way Tower, ground post, TA-33, Ham-M, Panadaptor, D-104 mike: $1500. You pick up. Also Elmac PMR-6A, AF67, DC power supplies, $125. W2DTE, Tel: BAyside 9-2449, 29-29 213th St. Bayside, L.I., N.Y.

APACHE, $160; SX-100, $145.00; D-104 mike w/stand, $14; Bud LF-601-A filter, $12. All in xclnt condx. Going mobile. W. H. Moore, K8AWX, 28868 Lorikay, Farmington, Michigan 48024.

FOR Sale: Hallicrafters HT-32, $275.00; SX-101 Mark III $165.00. Lester Grove, K2JKB, 400 White Horse Pike, Egg Harbor, N.J. R.D. Box 495.

SELL: 2-meter Comm. IV, cash and carry deal only: $180.00. Write G. Hertsch, W2FLR, 400 W. 119th St., New York City.

CASH For Drake RV-3. W5FTW, 5811 Elysian Fields, New Orleans, La.

WANTED: Hycon or Blackhawk 2.215 filters 2500 and 250 cycles. K5QPW, Box 187, Valentine, Texas, 79854.

TUBES Postpaid and guaranteed: 4-400As, $25.00; 4-1000As, $50; Johnson Viking I, fair, $75.00 ; Collins 310-B, exclnt, $150.00; Hallicrafters HT-9 modernized with VFO. New condx. 10 16 mtrs. $125.00 or best offer. Jennings UCSX vacuum variable capacitor 20-500 mmF, 10 KV. $20.00. C. R. Ashby, W7DTB, 206 E. 100 No. Clearfield, Utah.

75A-3 RX just realigned, $255.00; Valiant I f/w $195.00; Gonset Super 12 conv., $38.00; Elmac A-54H, $25.00. JT-30 mike, $5.00. K1ZDI, Billerica, Mass.

SELL: Hallicrafters HT-37, $295.00; SX-111 $160.00; Hammarlund HQ-170, $185.00, exclnt condx. Bruce Tis, K1WVY, 114 Dave's Lane, Southport, Conn.

GREAT Buy! Drake 2B, calibrator, Q-multiplier, realigned, $220.00; Knight T-150, VG, $90.00. Relay $5. First check for $300 takes all. Shipping collect. WB2PUK, Joe Aisenstadt, 102 Beach 62 St., Arverne, N.Y. 11692.

SELL: SR-160 transceiver P-150, 12 VDC power supply; R-47 speaker, push-to-talk mike. All in mint condx. Mounting rack, all cables: $370.00. Herman Slutske, W6ACB, 1020 S. Sherbourne Dr., Los Angeles, Calif. 90035.

CIRCUITS from Handbook, QST, CQ, etc. constructed. All work guaranteed. Reasonable. Free information. WA6IKV, Whitmore, 3240 Machado Ave., Santa Clara, Calif. 95051.

GONSET 6-meter Sidewinder. Homebrew 6146B amplifier, power supplies for both, two coax relays, Turner 454X mike, 6M624 Telrex beam with TR-44 rotor, spare 6146B, all for $450.00. WA0AUB, C. H. Reinhardt, 8600 Crystal.KC.Mo. 64138. Tel: 816-356-2458.

SALE Or trade: Hallicrafters SX-111 receiver with speaker, HT-37 exciter, HT-41 linear, AM-2 reflected power meter, antenna relay, antenna switch, linear in-and-out switch, 10-D mic., TB-500 beam and cables, 24-hour clock. Used very little. $800. Wanted: Fold-up camping trailer. Bill Gierhart, Box 119, Sapulpa, Okla. 74066.

EICO 720 xmtr, new, assembled for resale. Make an offer. KØROS, 918 South 1st St., Stillwater, Minn. 55082.

HEATH Shawnee 6-meter transceiver 12VDC-115VAC perfect condx, professionally wired. $175.00 or trade for gud revr or KW linear. K3IBQ, 1239 Wheatsheat Lane, Abington, Penna.

COLLINS 75S-1s. One each with and without Waters Q-multiplier. A used 75S-1 offers more real value and satisfaction. You can go first class for $295.00 or $325.00—and you won't go wrong. WØBNF, Box 105, Kearney, Nebr.

MUST Sell Ranger II, $200.00; Drake 2B/spkr, $250.00; Vibroplex Original Standard base $15.00; Astatic 10 DW/PTT, $25.00. Will deliver within 100 miles radius. K8VLZ, 29 West College Avenue, Westerville, Ohio.

DUMMY Load (film oxide) 52 ohms, all bands to 1 kw. coax input connector. Size 3 x 4 x 7. Kit, $7.95. Wired, $9.95. P.P. Ham-Kits, Box 175, Cranford, N.J.

PERFECT HT-32B, $400.00; SX-101A, $250.00; 75S-1 with 500 cycle filter, $370.00; Viking II with VFO, $150.00; National NC-270, $120.00; 310B-3, $75.00. Trades possible. W9IHZ, A. Brown, Brown Electronics, Inc., 1032 Broadway, Ft. Wayne, Ind.

FOR Sale: Johnson Vik. KW. with RH desk, Ranger exciter for AM. May be used for SSB with SSB exciter. Vy gud condx. Many extras, tubes. Asking $800.00. Pete Unchur, W2URM, RFD 5, Amsterdam, N.Y. 12010.

MAKE An offer on any or all of the following: Collins KWM-1 with A.C. supply and spkr; Collins 75A2-A with 3 K.C. and 800 cycle filters; Johnson Viking II with VFO, C-E 10-B with VFO, etc. All are in xclnt condx with many accessories and manuals. No reasonable offer refused. W4UXI, 3116 Burkeshore Rd., Winston-Salem, N.C.

$200 takes immaculate f/W Valiant, NC-183, $120. WAØETR, Sleepy Eye, Minn.

MUST Sell: Going to college. SX-111, $160.00; DX-40, $45.00; VF-1, $20.00. Mint condx. WB6DXB, 3340 Stauss, Oroville, Calif.

MOBILE SSB xmtr HX-20 and HP-10 P.S., $160.00; Panoramic Bandscanner, $80.00; VHF 152A, $25.00; Heath Q-multiplier, $5.00; B&W T-R switch, $12.00; Mod. xformers, 175 w. (new), $10; 60 w. $5.00; complete 20 W modulator, $12.00. W6SND, 4922 Cecilville Ave., La Crescenta, Calif. Tel: 248-2092.

GRICE Electronics, Inc. has Collins 310B, $125.00; 516 E-1, $120.00; PM-2, $125.00; 75 S-1, $325.00; and $350.00; 75A-4 with filter and spkr, $425.00; 75A-3 with two filters and C.C., $289.00. Write P.O. Box 1911, Pensacola, Fla. 32502.

FOR Sale: Johnson Invader, 200 watts SSB. Drake 2B, both in xclnt condx. Will make package deal. Write Steven Bear, WA2UAO, 62-60 99th St., Rego Park 74, N.Y. 11374 or call: 275-6831 after 8 PM.

WANTED: P&H VFO-Matic 8010, 5113, cleaning out HA-6, HA-220, 432 gear, SSB exciter, S-27, Panadaptor, ARR-4 through 4000 Mc. HP audio generator, test gear, antennas, parts. Stamp for three-page list. W4API, Box 4095, Arlington, Va. 22204.

BOOST Reception: 3.5-30 megacycle SK-20 Preselector kit, $18.98. Boost modulation AAA-1 clipper-filter kit, $10.99. Reduce noise: NJ-7 Noiseiector, IF, wired, $4.49. Postpaid! Literature free. Holstrom Associates, Box 8640-T, Sacramento, Calif. 95822.

FOR Sale: Heathkit HW-32 transceiver, mobile supply, P.T.T. mike, crystal calibrator, topper antenna and manuals, $180.00; Hallicrafters SX-100 with manual, $125.00. William Baldyga, K1YGS, 142 Torrington Heights Rd., Torrington, Conn. 06790.

ADVENTURER, $20.00:. Bill Rotecki, 19 W. 056 Rochdale, Lombard, Ill.

SELL: Eico 720, $65.00: D-104 mike, $12.00. WA9JJE. Tel: 798-6347.

NC-190, mint, $150.00; Challenger FW 120 watts, $90.00. Phone 643-5758 or write WA1AOJ, Tony Pavone, 327 Appleton St., Arlington, Mass.

SELL: Valiant, $195.00; NC-173, $90; VHF-152A converter, $35.00; Millen Preamp, $17.00. W9VBV, 830 Juniper, Northbrook, Ill. Tel: 272-2749.

SELL Or trade for NCX-5 class gear. Complete stereo system. Quad preamp and amps, KLH6s. SME arm, Thorens, TD-121 turntable, ADC1a cartridge, like new condx. W3WXC, 7 Louella Dr., Norristown, Penna. 19401.

MAKE Offer on all or part. HQ-110C, DX-40, VF1. All in like new condx. Might swap. Rex Creighton, 765 Mayfield, Lansing, Mich.

COLLINS 32S-3, $490; 516F-2 AC power supply, $75.00; 75S-3, $440; 312B-4 station control, $195; 30L-1, $520. Lot price: $1425. Equipment is in xclnt condx. Will ship in original cartons. Smith, W4WIT, 1610 Coventry Rd., Charlotte, N.C.

COLLINS KWM2, late model, 516F-2 supply, 40 ft. E-Z Way crank-up, self-supp, galv. tower; Ham-M rotor TH-4, Hy-Gain beam, all for $995.00. Sal Giordano, 2274 National Dr., Brooklyn 34, N.Y. Phone 212-RN3-8726.

DRAKE TR3 and RV3 with AC and DC supplies, $640.00; Ameco TX62 transmitter and Hallicrafters HA-5 VFO, $175.00; Heath HP23 power supply, $30.00; Eico modulator $40; Elmac AF-67, $35.00; ART-13, $35.00. Lysco transmitter, $25.00. Philip Schwebler, W9GCG, 4536 N. 50th St., Milwaukee, Wisconsin, 53218.

COMPLETE Ham Station: Hallicrafters SX-115 receiver; HT-32A transmitter; Heath Warrior linear, 4-element Hy-Gain beam; Ham-M rotator. Immaculate. Used sparingly. Must sacrifice! A. Campolieto, W2PMR, 6 Plumridge Rd., Mt. Glen Lakes, West Milford, N.J.

2 KW Collins station. Will divide. Mint condx. Just back from warranty station. KWM-2, No. 10140 and 516F, $850.00; 30S-1, No. 10272, with extra used tube, $900.00; 312B-4, No. 5424, $125.00. Lack operating time and need the cash. LeRoy S. Harris, WA4JSU, Box 143, Griffin, Ga.

FREE! Blue Book List: Leo offers hundreds of bargains on reconditioned gear: KWM-2, $675.00; SX-117, $260.10; SB-33, $245.65; King 500A, $259.00; Poly Comm 62, $206.10; Viking $500, $350.10; NC-300, $189.00; SR-160, $237.15; NCL-2000, $485.00; Galaxy 300, $215.10; SX-101, $170.10. Many more. Free 1965 Catalog. WRL, Leo, WØGFQ, Box 919, Council Bluffs, Iowa.

FOR Sale: HT-37 and SX-101 Mark IIIA, in fine shape, $525.00; SR-160 with AC-DC power supply in fine shape, $425.00. Write KØHQV/Ø, 120-2, Chevy Chase, Minot AFB, No. Dak.

CRYSTALS Airmailed: MARS Marine, CD, Kits, SSB, Nets, Novice, etc. Custom finished etch stabilized FT-243, .01% any kilocycle 3500 to 8600 $1.90. (Five or more same or mixed frequencies $1.70.) (10 or more same frequency $1.35) 1700 to 3499 and 8601 to 20.000 $2.50. Overtones above 10,000. Add 50¢ each for .005%, HC-6/u metal miniatures above 2000 add 75¢ each. ARRL Kits: FT-243; "DCS-500", "IMP", "Three Band Converter", $9.95. Many other filter and oscillator crystals and kits including 370 to 540 Kc. FT-241 and HC-6/u. Write—state exact needs. Add 10¢/crystal airmail, 5¢ surface. Crystals since 1933. C-W Crystals, Box 2065-Q, 1 Monte, California.

NAVY Radio receiver Model R.C.H. Freq. range 80 to 560 Kc. and 1.9 to 24 Mcs.; 115V 60 cycles, one phase, extra parts, with loud speaker, panel. Will ship only 100 miles radius in state. $125.00. Daniel A. Conlin, W1ZJW, 51 Reed St., Worcester, Mass.

DX-100B, $125.00; Drake 2B, 2 AC calibrator, $200. K1TKS, 71 Boardman Rd., Bristol, Conn. 06011.

SELL: Hammarlund HX-500, Perf. Condx, used about 100 hours. Best offer over $325.00. K2DJH, Don Alfred, 120 The Fellsway, Murray Hill, N.J.

WANTED For cash: Mechanical filter Collins Type F455-5 P/N 526-9365-00. 455 Kc. CPS bandwidth. For sale, for cash: Collins mechanical filters, several types. Write, stating requirements. Al Lower W6CLB, Arden Way, Sacramento, Calif. 95825.

DX-60 for sale. Best offer takes it. Write to Jorge S. Perich, 660 39th St., Union City, N.J. or call 863-3228.

WILL Sell: Crystal controlled 600-watt transmitter, 80-20 meters. $80.00. Lindsley Colclough, K2LLA, Hillsdale, N.Y.

DX-40, VF-1, VFO and JT-30 mike. All in xclnt condx. $55.00. KØUIJ, Bill Brinkman, 1109 Alexander, Crookston, Minn. Tel: 218-281-5685.

COLLINS KWM-1 mobile supply 516E-1 and mount 351D-1, with cable: $95.00. W8YAC, 545 Possum Rd., W., Springfield, Ohio.

FREE Gonset Converter with A-1 factory-wired Viking II, 255AVFO, SX-99 for $200 Will sell separately. Also SP-600JX, $275.00. K1CBJ, 133 No. Main St., So. Hadley, Mass. 01043.

TOOOOBES, Transmitting—special purpose, new, boxed, guaranteed. 6CW4, $1.40; 6146B, $4.75; 417A, $3.95; 826, $6.90. Free catalog. Vanbar Dist., Box 444, Stirling, N.J. 07980.

SELL: Excellent condx, Apache, $145.00; SX-100, $145.00 Eico 425K oscilloscope, $20.00. Norman Wise, K2QDM, 108-14 65 Road, Forest Hills 75, L.I., N.Y.

NC-183, $85; Globe King 400B with spares, $140.00. Both have manuals. K6ILM, 835 Valencia, S.F., Calif.

SELL: Drake TR-3, AC P/S, RV-3, exclnt condx. First money-order for $575.00 takes all. Bill Uhl, 144 Oak Knoll Drive, Dayton, Ohio. 45419. Tel: 513-298-6792.

KNIGHT T-150A, $79.00; SX-101, $165.00. Both for $235.00. K7ZEN, 2217 N.E. Fremont, Portland, Oregon 97212.

WANTED: Collins mechanical filter conversion kit 354A-1. W1ZUH.

FOR Sale: Harvey-Wells T-90 xmtr and APS-90 supply, $149.00 in original cartons. HK-145C, in mint condx, $159.00. All with manuals. W1JMM RFD #1, Sturbridge, Mass. 347-3184.

FOR Sale: One 75A-4 Collins receiver; one 100V Central Electronics single sideband, one KWM-2 Collins transceiver. All in xclnt condx, and all inquiries will be answered. Al Ruska, Jr. K8HNW, 11533 Copas Rd., Lennon, Michigan

SELL Collins 32V-2 with spare 4D32, $185.00; 75A-2, $235.00. Both for $400.00. Jack Gutzeit, 75-02 168 St., Flushing, N.Y. 11366.

SWAN 140, solid state RCA 12-volt DC supply; HP-20 AC with speaker, New-Tronics whip. All in 1st class condx: $225.00. WB2NDW, 21 Eleron Pl., Wayne, N.J.

FOR Sale: Wonderful buy for beginning Novice: Heath HR-10 receiver with xtal calibrator and matching DX-60 transmitter, $120.00. Bill Wetzel, WB2RJN, 310-43rd St. So., Brigantine, N.J. 08203. Tel: 609-266-3267.

SX-117 with WWV and 10-meter xtals, $265.00; will ship C.o.d. M. C. Smith, W6GMC, 614 Bradbury Rd., Monrovia, Calif. 91016.

"HOSS Trader" Ed Moory offers demonstrator "worn" equipment, factory warranty: Swan 350, $349.00; TR-3, $449.00; SB-34, $329.00; KWM-2, $895.00; 75S-3B, $519.00; demo Galaxy V, $339.00; 2 left at old price, new NCX-5, $585.00 and NCL-2000, $585.00. Package deal: new KWM-2 516F-2 supply and Collins 30L-1 linear installed in new design Ambassador walnut desk. Total price $1995.00; demo Ham-M rotor and new TA-33 beam, $189.00. Reconditioned gear: SB-33, $129.00; HT-37, $249.00; 200-V, $439.00; 100-V, $379.00; 2-B, $189.00; factory reconditioned KWS-1, $695.00; Johnson Ranger II, $189.00; TR-3, $409.00; Swan SW-350, $299.00; Drake R-4, $295.00; Swan 240, $239.00; Viking Valiant, $169.00. Terms, cash. Ed Moory Wholesale Radio Co., P.O. Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

FOR Sale: DX-100, $90.00; Apache TX-1, $135.00; SB-10, $65.00; TA-33 Sr., Tribander $55.00; HE-89, 6 & 2 M VFO, $20.00; D-104 mike, $20.00. K1FRU, 105 Cove Rd., Stamford, Conn.

SELLING Gonset Sidewinder 900-A with AC supply for 2-meters. Used two hours. Want only $390.00 F.o.b. Chicago. J. Leonard Herron, WA9MPG, 5701 Sheridan Rd., Chicago, Ill.

SELL: KWM-2, S/N 12335, 516F-2 AC supply, 516E-1 DC supply, 351D-2 mobile mount, all less than 1 year old, except the 516E-1. Price: $1000.00. May trade. W4KGR, 2333 Elizabeth, Winston-Salem, N.C.

COLLINS 51J4 (modified 51J3-R-388) receiver, product detector and hang AVC, 3.1 Kc. mech. filter. In exclnt condx. $345.00 Dennis Dressler, KØLAD, Rte. 7, Topeka, Kan.

HT-37, LA-400C linear, HW-12, HP-13 DC supply, HP-23 AC, HM-11 SWR meter, all in mint condx. 30 ft. wooden tower, Triband Hornet beam. Best offer. W2LYP, Box 515, Iselin, N.J.

RANGER II, perfect condx, $220.00; HQ-110C with Ameco 6-mtr. preamp., $125.00. Tel Blaho, K8WNL. 342 Sherwood, Hilliard, Ohio.

HAMMARLUND: HQ-170AC, perf. condc. original carton: 5 hours use for evaluation only. $275.00, or your best offer. W2PBG, 67 Brand Dr., Huntington, N.Y. 11743. Tel: 516-HA-1-0266.

SELL: Best offer all or part, used, but excellent: BC-1255A freq. mon., BC221A freq. meter; original carton: BC375E transmitter, All TU; Two BC645A trans-rec., BC946B rec. Bob 808, Arlington, Texas.

TEN Meter kilowatt, exciter and final amp., differential keying, includes 6146 and 4-400 tubes; high power AM modulator (only one left): UTC CVM5 mod trans. on 13 & 17 chassis, 14 in. high panel, PP 6L6, 810s, inc. p/s on addtl. chassis; 866As 1750 v. 625/500 Ma. Pick up at $85 for modulator. Best offer on 4-400 rig. Also make offer and pick up reconditioned Hy-Gain 10-15-20 beam. Send SASE for list of assorted meters and items. ARRL, Attn. F. E. Handy, 225 Main St., Newington, Conn. 06111.

FOR Sale: DX-100 transmitter; National NC-300 receiver. WA4NQH, 109 Gillespie Avenue, Hartford, Kentucky 42347.

FOR Sale: Drake 2-A, xtal calibrator, Q-multiplier, like new, $165.00. W. H. McLeod, 576 Solon Rd., Chagrin Falls, Ohio. 44022.

FOR Sale: One HT-44, $275.00; One SX-117 (with 4 xtals), $275.00; one SR-150, $450.00; one P-150-DC, $68.00; two P-150-AC $140.00; one HA-8, $15.00. Dick Bellew, W5CGR, 1005 W. 4th St., El Dorado, Arks.

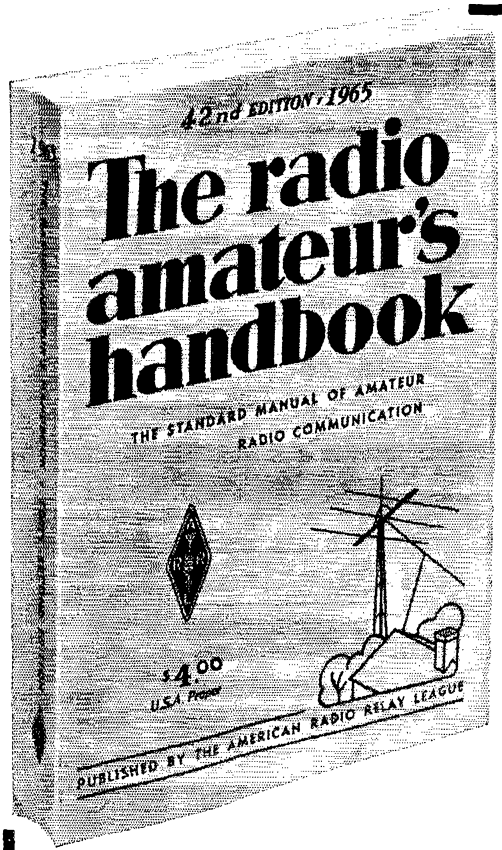
SELL: Collins 75A4, $375.00; Central Electronics 100V, $375; Johnson 2 Kw Thunderbolt, $260.00. Dr. Marvin Hash, W7YHS, 319 N. 26th St., Billings, Montana 59101.

FOR Sale: Alltronics RTTY converter with tuning scope, nearly new, perf. condx. RD-60 code ink recorder, new condx. 32V1 transmitter. TG-34 keyer, new. Best offer. Claude Sweger, Box 192, Alamo, Texas.

CANADIANS: Sell Exchange Invader 2000, Valiant, R390 rcvr, TBS50D, BC375E, 696A, APR4, ART13, Edison cylinder gramaphone, Atwater Kent antique, G4ZU antenna, many others. Parts, etc. VE3BVX, 11 Sussex St. N., Lindsay, Ont.P., Canada.

LINEARS! All powers! 80-2! Write SRS Electronics, Box 267, Newark, Delaware.

Index of Advertisers



1965 EDITION

BIG . . . REVISED . . . COMPLETE . . .

THE STANDARD reference work and text for everyone—radio amateurs, engineers, lab men, technicians, experimenters, students, purchasing agents.

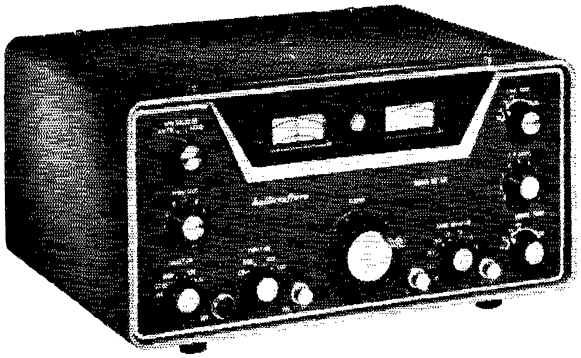
Annual revision is a feature of the *Handbook*, always with the objective of presenting the soundest and best aspects of current practice. The big, 1965 Edition contains new descriptions of equipment. Semi-conductor and vacuum tube tables are brought up to date. Every important aspect of amateur radio is covered: transmitting, c.w., a.m., sideband, radioteletype; receiving; mobile; v.h.f.; propagation; antennas; construction; theory; charts; diagrams; transistors; vacuum tubes; station assembly and operation. The complete handbook!

$4.00 USA proper $4.50 US Possessions and Canada $5.50 Elsewhere

Clothbound Edition $6.50 USA, Possessions and Canada, $7.00 Elsewhere

The AMERICAN RADIO RELAY LEAGUE, Inc.
NEWINGTON, CONN. 06111

HARRISON CORNERS THE MARKET...
and saves you $200!



HALLICRAFTERS HT-44 SSB/CW/AM

- FIVE Bands, 80 thru 10. (10 and 15 DX is starting into FB sun-spot cycle!)
- Full 200 Watt input on CW and SSB, 50 Watt AM.
- VOX, CW break-in, and PTT included.
- Direct VFO control (or, transceive with an SX-117 receiver).
- Amplified ALC.
- Compact! Cabinet only 7⅛" x 15" x 13"

JOIN THE FUN ON 6 METERS!

For only $120 extra, we will include a brand new Hallicrafters HA-6 TRANSVERTER and matching P-26 pack. (Original Ham net price $449.00!)

This superbly engineered broad-band unit changes your transmitter's 10 meter SSB, CW or AM output into a stable, powerful 6 meter signal. Up to 120 watts input, for real sock!

It also converts the received 6 meter signal to 10 meter input to your receiver.

Harrison certainly brings you the bargains! Here's more than $940 worth of brand new, high quality equipment for only $414.

The famous Hallicrafters HT-44 transmitter is the hottest value around—so—we went out and bought up all the factory had.

Rather than sit back and command the full Amateur net price of $494.50, we are passing along to you the substantial saving made possible by our tremendous volume purchase—the biggest in all Ham history!

NOW, for only $294
(or as little as $14 a month)

. . . you can enjoy the powerful performance of this most popular **five** band, SSB, CW and AM transmitter. Read the specs, listen to proud owners' FB signals on all bands, then rush your order in for your HT-44!

Each one is brand new, latest production, in sealed carton, and comes complete with matching PS-150 AC power supply/speaker. Fully guaranteed by both Hallicrafters and Harrison.

LIMITED QUANTITY at this sensationally low price. Get yours now!
Low Monthly Payments.
Top allowance for your old rig.

HARRISON

"HAM HEADQUARTERS, USA"®
225 Greenwich St., New York, N.Y. 10007
(212) BA 7-7922
Visit Our Long Island Store
139-20 Hillside Avenue, Jamaica

225

OK, Bil:

I want to take advantage of the "hottest buy" in Ham history. Send me:

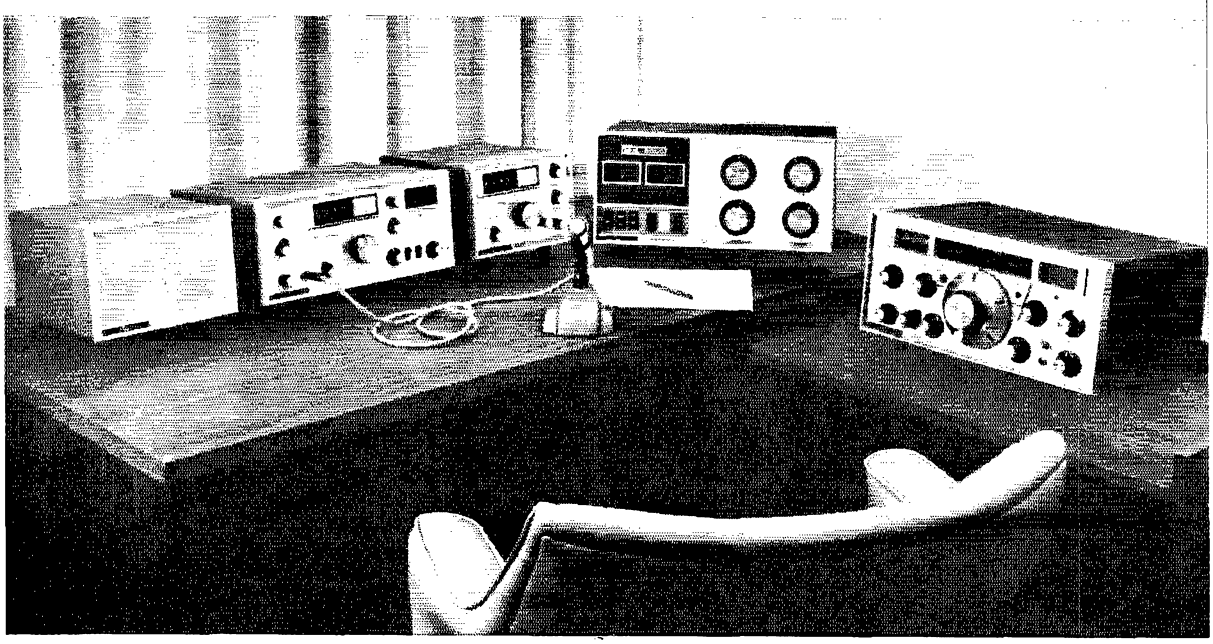
☐ A brand new HT-44 and AC pack, for only $294.
☐ I also want to have fun on 6 meters, so include an HA-6 and P-26 for only $120 more.

Enclosed is $_____

Name_____ Call_____

Address_____

Live a little



This desk-top amateur station by National includes the NCX-5 all-band transceiver, with digital counter read-out accurate to 1 Kc on each band and **Transceive Vernier** control to provide up to ±5 Kc separation of receive and transmit frequencies. Transmit-receive selectivity is provided by National's 8-pole crystal filter with greater skirt selectivity than any filter ever manufactured for amateur equipment. The NCX-5 provides operation on upper or lower sideband, compatible AM, or break-in CW. $685 ■ The NCX-A power supply/speaker console operates from either 115/230 V.A.C. and provides all operating voltages for the NCX-5. $110 ■ The VX-501 VFO console provides choice of completely independent transmit-receive frequency control of the NCX-5, as well as transceive operation from either VX-501 or NCX-5, and also offers five crystal channel positions for net or novice use. **$249.95** ■ The NCL-2000 is a completely self-contained 2 Kw SSB PEP linear amplifier for the 80 through 10 meter bands, with minimum peak output of 1300 watts. It may also be operated for CW, AM, or RTTY at 1000 watts DC input. $685 ■ The HRO-500 is a frequency synthesized and phase-locked solid state receiver covering the five kilocycle through 30 Mc frequency range with identical 1 Kc calibration, high stability from turn-on, and 10 Kc per turn tuning rate throughout. **Passband Tuning** is offered for SSB and CW operation, and IF bandwidths up to 8 Kc are included. Operates from either 115/230 V.A.C. or 12 V.D.C. sources. Power drain from a 12 V. battery (with pilot lamps switched off) is 200 Ma. $1295 ■ Not pictured is the popular NCX-3 tri-band transceiver, at $369.

NATIONAL RADIO COMPANY, INC. **37 WASHINGTON STREET, MELROSE, MASS. 02176**

World Wide Export Sales: Auriema International Group, 85 Broad St., N. Y. C.; Canada: Tri-Tel Associates, 81 Sheppard Ave. W., Willowdale, Ontario

CREATED BY THE HAND OF EXPERIENCE

NEW LOOK IN RCA POWER TUBES FOR UHF!

All have one-piece, precision aligned grids and use coaxial-electrode design

Benefits:
higher efficiency at UHF, rugged construction for any kind of operation

Here they are—the latest RCA power tubes for modern transmitters. In a compact chassis they'll QRO for you with less driving power than many conventional types working on the lower bands. And, if you want to operate mobile, these tubes will deliver rated power over quite a wide swing in battery voltage.

High-perveance design enables you to get the power you want at UHF with lower plate voltages. Metal-ceramic construction provides remarkable cooling capabilities. Tube life is outstanding.

Why not let your RCA Industrial Tube Distributor bring you up to date on these and other power tube developments with a copy of the new PWR-506A Product Guide for RCA Power Tubes. Or, for additional technical information write: Commercial Engineering, Section G37M RCA Electronic Components and Devices, Harrison, N. J.

TYPICAL OPERATION
Class C Telegraphy or RF Telephony Service

Type	Cooling	Maximum Plate Dissipation (watts)	Plate Voltage (volts)	Frequency (Mc)	Useful Power Output (watts)
8072	Conduction	100*	700	50 175 470	110 105 85
8121	Forced-air	150	1500	50 470	275 235
8122	Forced-air	400	2000	50 470	375 300
8462 (Quick-heating)	Conduction	100*	700	50 175 470	110 105 85

*May be higher, depending on heat-sink design

The Most Trusted Name in Electronics