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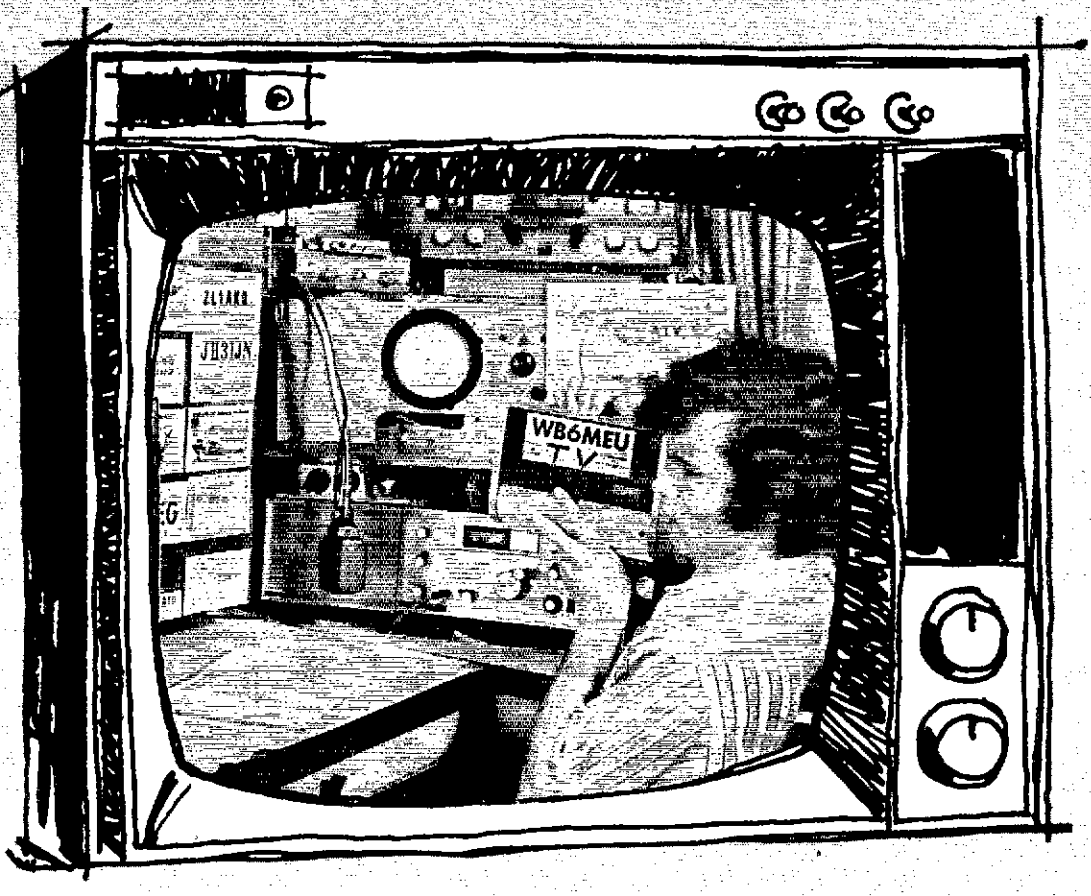

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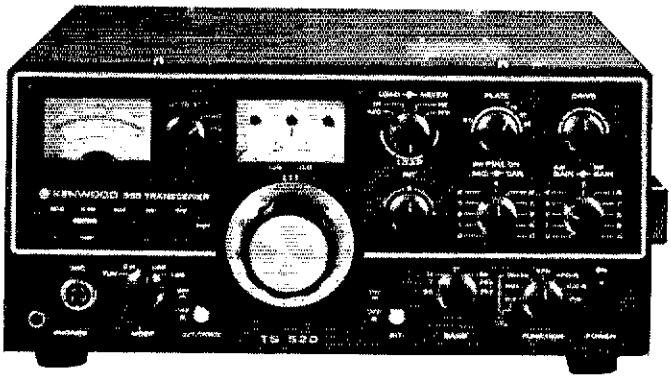

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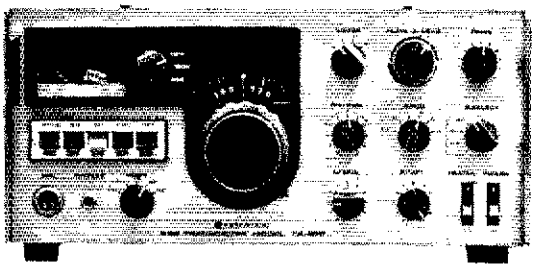

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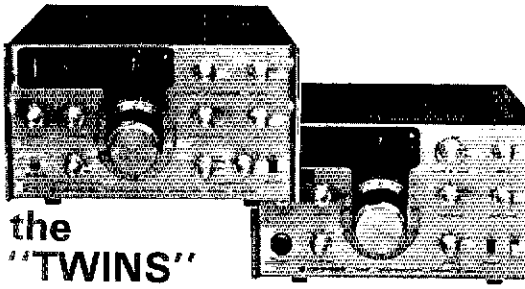

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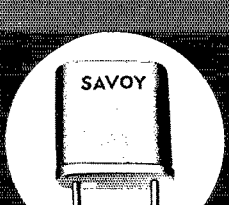

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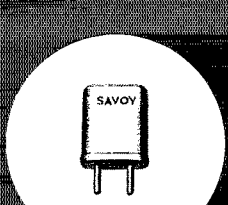

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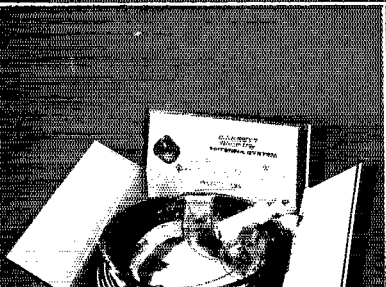

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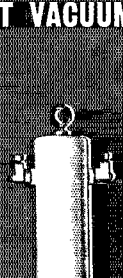

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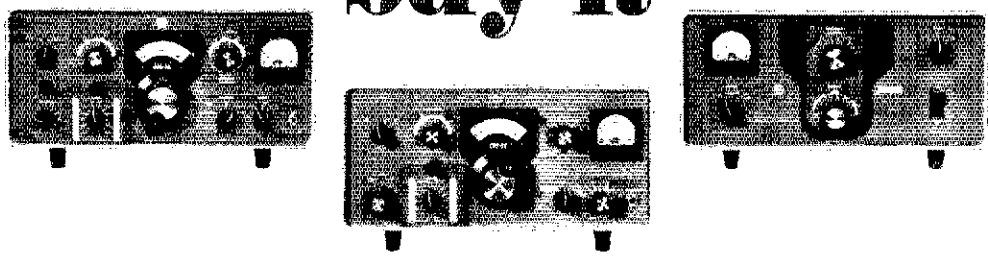

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OUR COVER Ever toy with the idea of going on ATV? See page 11 for some practical tips on getting started.

QST

January 1975

Volume LIX Number 1

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– CONTENTS –

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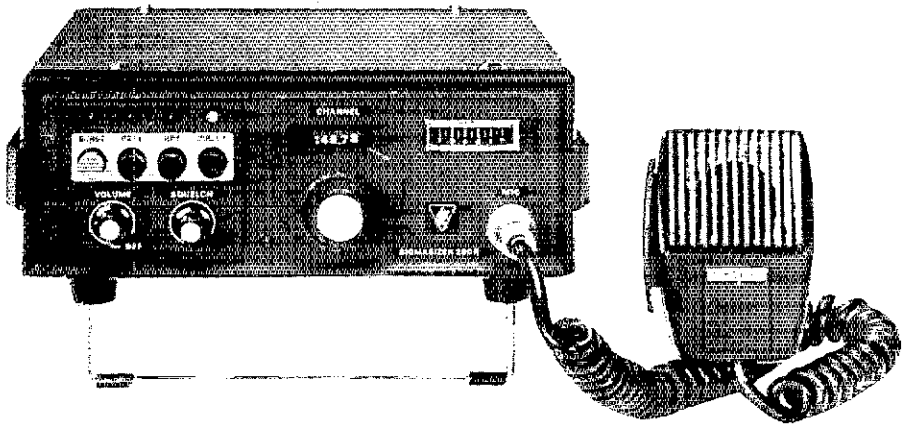

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NEWINGTON, CONN., U.S.A. 06111

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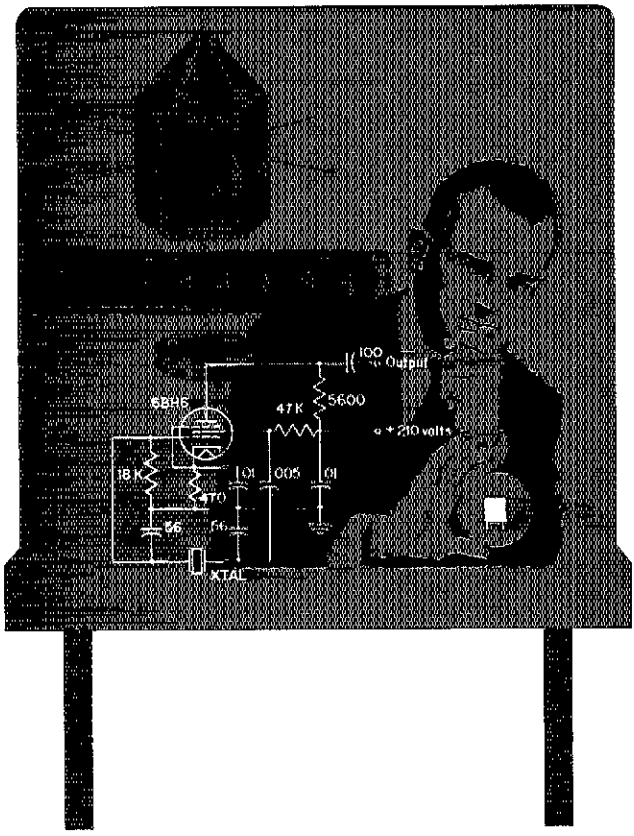

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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.

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1310 South Tejon St., Denver, CO 80223

Southeastern Division

LARRY E. PRICE W4DQD
P. O. Box 2067, Georgia Southern Branch
Statesboro, GA 30458
Vice-Director: Ted R. Wayne WB4CBP
8250 S.W. 108th St., Miami, FL 33156

Southwestern Division

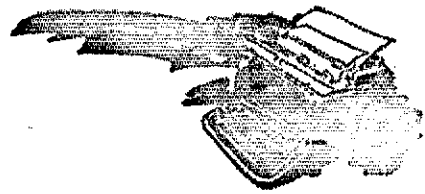
JOHN R. GRIGGS* W6KW
1273 13th St., Baywood Park, Los Osos,
CA 93402
Vice-Director: Jay A. Holladay W6EJJ
6128 Jessen Dr., La Canada, CA 91011

West Gulf Division

ROY L. ALBRIGHT* W5EYB
107 Rosemary, San Antonio, TX 78209
Vice-Director: Jack D. Gant W5GM
921 Monroe, N.W., Ardmore, OK 73401

* Member Executive Committee

"It Seems to Us..."



CARAVAN TRACKS — 1974

"This great avocation of ours is assisting the caravan of civilization to travel in the right direction." – *The Hon. Armin H. Meyer, W3ACE.*

HURRICANE Fifi . . . FCC/ARRL meeting . . . April tornadoes . . . Red Cross cooperative agreement . . . ARRL Foundation . . . Oscar 7 . . . G3CY's Nobel Prize – these are a few of the amateur radio milestones recorded by the caravan of civilization during its 1974 trek.

In mid-September, Hurricane Fifi came raging through the Caribbean, dumping tons of rain when it scraped across Honduras. Death and destruction followed, in horrifying measure. The HR government called upon radio amateurs to provide communications to rebuild – both within the country and with the outside world. And amateurs responded: as this is written, amateur networks are still handling official communications. Closer to home, a spate of tornadoes hit the central states on April 3. Hams substituted for the Xenia, Ohio, telephone system . . . located tetanus toxoid shots and the personnel to administer them . . . coordinated shipment of relief supplies . . . aided the search for victims . . . brought in generators to pump water – all as reported in October *QST*. This capability doesn't just happen; it is developed by the Simulated Emergency Test, Field Day, and innumerable RACES and AREC drills. A recognition of amateur radio's value in emergency communications came from the American National Red Cross in updating and renewing its cooperative agreement with ARRL.

The regulatory scene, too, always seems to provide some milestones for our avocation. In 1974, these were many and varied. There was a meeting in May of FCC personnel with officers, directors and staff of ARRL with information flowing freely. There was "re-regulation" of amateur radio; transfer of repeater antenna and power data from an official filing to a logging requirement; the easing of logging rules almost to the point of disappearance; proposed rulemaking for crossbanding, linking and automatic control of repeaters; proposed simplification of RACES rules; a proposed common frequency for Alaskan emergency communications; favorable settlement of the emergency medical radio service issue, which, for a time, threatened our 420-450 band, and of the environmental protection measure, which might have buried us in paperwork. (The EMRS paging services were placed above 450 MHz; the environmental rules apply only to structures in excess of 300 feet).

Not all was rosy, however. The proposal to take 224-225 MHz for a new Class E Citizens Radio Service still hung over us, with rumors of 223-224 involved also. A new proposal, to permit "Temporary operation of the Hiran service on a non-interference basis," threatens our 420-450 MHz band, once again. Other regulatory topics pending include possible rules for the Amateur-satellite Service; lower license fees (or, if ARRL prevails, none at all); callsigns on request for Extra Class licensees; formalization of rules for commemorative stations; and new amateur bands in the gigahertz ranges. Easier and more expeditious licensing of repeaters became a reality. A broad new restructuring of the amateur service,with a code-free license at or above 144 MHz, loomed nearer. The "Extended Examination Program" in five FCC districts was begun, to test the feasibility of the Civil Service Commission administering FCC examinations, and six cities were added to the regular semiannual examination-point list. The courts began cracking down hard on flagrant violators of the Citizens Radio Service rules, as for instance with a prison sentence for the founder of the scofflaw United CBers of America. FCC, too, increased its enforcement activities on 27 MHz with wider use of traveling teams of monitors. It also moved to liberalize the CB rules in comparatively-minor points, and tighten them against violations of important rules, as for instance, the sale, use or even possession of high-power single-band amplifiers.

Turning to international affairs, the International Amateur Radio Union is presently voting on a new constitution which formally provides for regional organizations (actually, in existence for years because the need was there). The Union also

(Continued on page 148)

League Lines . . .

VE2IJ, VE2TZ, VE2PC, VE2BCT and VE2MS have formed "Radio Amateurs Serving the Olympics" in connection with the 1976 summer games in Montreal. A special ham station will operate directly from the stadium.

An advisory committee to the U.S. Information Agency recommends construction of 2500-kW transmitters for VOA to "obtain superiority" over the 500-kW outfits of other major nations. About as senseless as the arms race -- nobody wins in the long run.

The stolen car of a Phoenix ham was recovered, even though camouflaged by repainting -- the ARRL decal in the rear window was the identification! Speaking of emblems, W2BAY suggests double-faced adhesive stickers (like those used for picture mounts) for temporary attachments of the new embroidered diamond patches to blazers.

Remember Docket 19555, about environmental protection, antenna towers and such? It was settled, so far as amateurs are concerned, in October with the FCC announcement that only microwave dishes over 100 feet above the ground and other antenna structures over 300 feet would require environmental impact studies and reports. Incidentally, General Counsel Booth's filing in that docket, on behalf of the League, remains in our opinion among the masterpieces of that genre; it ran in "Happenings" just two years ago last month.

Hq. is working on preparation of code practice material in cassette form for sale to members. In the process we discovered several clubs have projects of their own, one being the Utah Amateur Radio Club with hour-long tapes from 5 to 25 wpm. K7HFV (632 University, SLC 84106) has all the info.

With practically no fanfare, WWV has commenced propagation forecasts updated as often as hourly -- listen at 14 minutes after the hour. "World Above" this month has a brief comment -- we'll follow next month with details.

Looked at your license lately? Maybe renewal is getting close. And maybe you haven't yet notified the Commission of your last change of address. Members have been in touch with us about having gone past their expiration date and about being fined for not having their current address on file with FCC -- don't let it happen to you!

New chairmen for ARRL advisory committees are: Contest -- K7NHV; DX -- WA8ZDF; VHF Repeater -- W6OLD. WA4PBG still heads the Emergency Communications group. Any or all would be glad to hear from members with comments and suggestions in those specialty areas.

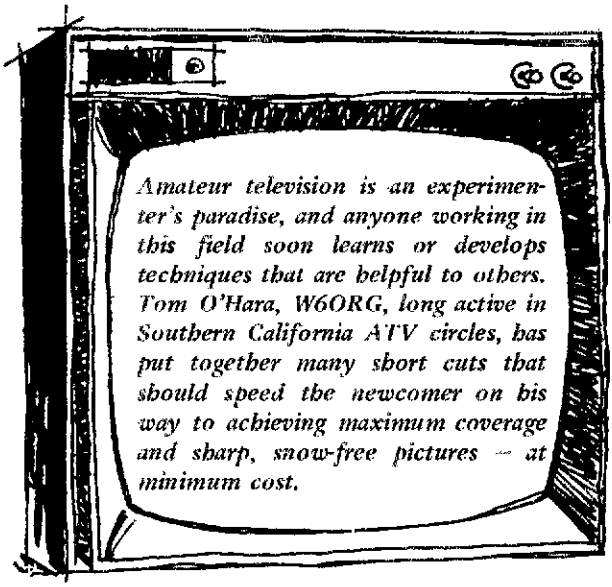
And so would your director (address page 8) in preparation for the annual Board meeting commencing January 16. Input from individuals and clubs will assure the League remaining responsive to membership needs. If the "restructuring" proposal is out by then, as persistent rumors indicate, it will undoubtedly be the major subject of consideration.

It's been a long time since we've seen an FCC Rulemaking proceeding produce the amount of interest that Docket 20092 on call signs for Extras has. While the deadlines for filing comments have passed, early action by the Commission is unlikely. So don't turn in your application yet; there will be plenty of time to do so when (if!) the Commission announces its final action.

A repeat warning for volunteer examiners -- you're not allowed to check the applicant's exam papers or enter into any discussion about the questions on the test. This prohibition is among the instructions on the examination envelope.

Watch those inside band edges like 14,025; 14,200 and 14,275 kHz -- there have been citations! We have our own opinion about which monitoring activities should get priority from the Commission . . . but if we amateurs stay legal there is nothing to cite, right?

Korea and the U.S. again concluded a 3rd party traffic agreement for the holiday season, officially December 22 to January 4. Didn't hear about it in time? Then you haven't developed the W1AW habit!



Amateur television is an experimenter's paradise, and anyone working in this field soon learns or develops techniques that are helpful to others. Tom O'Hara, W6ORG, long active in Southern California ATV circles, has put together many short cuts that should speed the newcomer on his way to achieving maximum coverage and sharp, snow-free pictures – at minimum cost.

PRACTICAL IDEAS FOR THE ATV ENTHUSIAST

BY THOMAS R. O'HARA,* W6ORG

Part I – Receivers and Antennas

AMATEUR TELEVISION, using commercial video standards, should not be confused with slow-scan TV now popular on the hf bands. Both have their uses, but methods and results are very different. Slow-scan takes time – about 8 seconds per frame – whereas the TV we'll be discussing here is essentially instantaneous. Slow-scan is also limited in definition, but it has the marked advantage of being a narrow-band system, so it is permitted in our hf bands. What will hereinafter be called ATV is inherently a wide-band mode, so it is restricted to use above 420 MHz. (The U.S. 420-MHz band is 109 times the width of the slow-scan segment of the 14-MHz band!) ATV picture detail can be excellent – potentially at least equal to the best commercial TV.

You may like one or the other, or both. If worldwide DX using all-commercial equipment interests you, slow-scan can add a new dimension to an already exciting DX medium If you like building gear or revamping surplus equipment, and you think that televising a parade, or watching a friend's home movies on your TV screen might be fun, uhf ATV may be your field. It need not be expensive. Good ATV signals have been put on the air for a total investment under $200, and little more technical involvement is entailed than in getting on 2-meter fm with an old Motorola police rig. You may end up using ATV to brag about your 20-meter DX, as WB6MEU appears to be doing in one of the photographs.

* 2522 S. Paxon Ln., Arcadia, CA 91006.

ATV DX may not be great in miles or countries, but consistent coverage with pictures of usable quality can be quite good. When tropospheric conditions are favorable, you may be swapping reports (visually, of course) over paths like the mountainous one between Los Angeles and San Diego. Several hundred miles up and down the Atlantic Seaboard, or 1000 or so across the Gulf, between Florida and Texas, is well within the bounds of possibility. A reliable rule-of-thumb for average propagation is that a distance you can cover satisfactorily with 5 watts on 2-meter a-m or fm will give good pictures with 15 watts and a good antenna in ATV work.

A Few Preliminaries

The block diagram of a complete ATV station is shown in Fig. 1. Most ATV beginners use equipment along the lines detailed here – inexpensive to buy and relatively easy to adapt to ATV needs. Once you're on the air you can refine and expand as time, talents, and resources allow. A desirable first step is to locate a fellow ham who is already on ATV or about ready to go on. Two stations working together is much better than one person working alone. Your friend can "talk your picture in" on another frequency, while you adjust for picture quality. Monitoring your own signal can be misleading, because of almost certain overloading of your receiver. Your picture may look fine on your own set, but have low contrast at distant points.

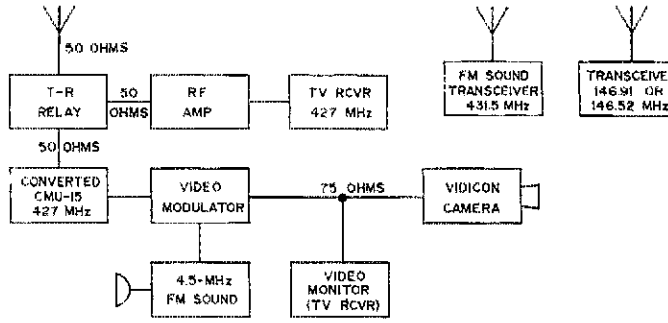


Fig. 1 — Block diagram of a complete ATV station. The beginner may go on the air minus one or more of the station components shown. Where frequencies are given they are channels commonly used in Southern California, and not necessarily applicable in other localities. The 146-MHz channels are used primarily for calling purposes. Local 2-meter repeater frequencies may be used briefly for this purpose, as well.

An agreed-on voice calling frequency in a well-used band is helpful in building ATV interest and activity. In Southern California, 146.91 MHz is almost universally monitored for ATV purposes. The 146.52-MHz fm simplex channel is also popular. In many areas local fm repeater channels are useful in initiating ATV tests and QSOs. (Video transmissions are made on a higher frequency band.)

Some standard for video carrier frequency is important. Most people find it hard to believe, but the 420-MHz band is filling up fast. The range from 442 to 450 is loaded with fm in many areas; 435 to 438 is satellite territory. The 431- to 433-MHz range is used for narrow-band modes, in DX and local communication, with moonbounce becoming ever more widely used. Californians have settled on 427.0 MHz for the video carrier, and 431.5 MHz for the fm-sound subcarrier.

Even though the sidebands in a good ATV system extend out to plus-or-minus 6 MHz, sync-buzz interference is troublesome out to only about 2 MHz on either side, as the instantaneous video power at any one frequency beyond that point is negligible. Crystal control should be employed, so that the transmitter frequency will not drift into other portions of the band. The modulated-oscillator approach, long used in getting started in ATV work, is no longer acceptable on this account.

ATV Reception

Amateur TV of the fast-scan (uhf) variety uses the same video standards as commercial TV, so the simplest way to receive it is to modify the uhf tuner in a conventional home TV receiver, to tune the 420-MHz amateur band. Rather than borrow the family TV set, it may be better to buy an inexpensive set, new or of recent manufacture. Some of the best are small Japanese models made after 1970, which usually have low-noise hot-carrier diode mixers. Before you dig into the set, get a service manual, a Sams Fotofact sheet, or at least a circuit diagram, if you can. Almost any TV receiver is usable, and conversion is not difficult.

A tunable converter ahead of a TV set having no uhf coverage will do, though such old sets may not have very good definition by now, and early uhf converters are generally low on sensitivity. Tunable converters are preferred over the crystal-controlled variety, for several reasons. ATV is normally a-m, with two sidebands, rather than the carrier-and-one sideband of commercial TV. For the clearest picture it is helpful to be able to tune off to one side or the other of the ATV carrier, depending on the shape of the receiver i-f passband, and local occupancy of the lower vhf TV channels.)A strong local vhf TV signal may ride through the uhf converter, or be picked up by the receiver circuits directly.) Crystal-controlled converters made for amateur narrow-band communication, mainly around 432 MHz, may have high-Q circuitry that restricts the receiving bandwidth to less than needed for high-resolution video. Adequate bandwidth is important in assuring really clear, crisp picture reception.

External uhf converters, such as those made by Blonder-Tongue and Archer, can be padded down easily. Practically all older uhf front ends in TV receivers are in converter form, designed to work into one of the lower vhf channels. Newer sets have provision for working directly into the receiver i-f system. Modification of a Sickles uhf converter, found in many home TV sets having uhf coverage, is described in two *QST* articles.[1] Procedure is likely to be more or less the same, regardless of tuner make or design.

The simplest way to get the tuning range down into the 420-MHz band is to add capacitance across

[1] Bertini, "Tunable 440-MHz Receiver," July, 1971, *QST*, and "Tuner for ATV Applications," October, 1973, *QST*. Condensations of this information in *Specialized Communications Techniques for the Radio Amateur*. ARRL, 1975.

the tuned circuits of the uhf converter. This may be desirable, as it will leave the receiver still capable of tuning the low end of the uhf TV range, and restoration of the original tuning range is fairly easy. Smoother tuning and much better reception will result from removing plates from each section of the variable capacitor and adding adjustable padder capacitors. Leave one stator and one rotor plate in each capacitor section, the rotor plate left to be that having radial slits for adjustment of tracking.

If the tuning capacitor is left intact, add trimmers of about 1-3 pF in range. If plates are removed for band spreading, about 9-pF maximum capacitance will be needed in the padders. In either case, the first alignment step is to locate the ATV frequency by adjusting the oscillator padder. Then peak the other sections for maximum signal, as in any receiver alignment. A signal generator is helpful, though not absolutely necessary.

In some converters the *L/C* ratio may get too low to sustain oscillation. If this happens, cut the oscillator line and insert a loop or turn of No. 20 wire, about 3/16 inch in diameter. When the additional needed inductance is found, a similar change can be made in the other lines, to maintain tracking.

In lieu of a signal generator, the signal from a nearby ATV station can be used for alignment. If you have the other's cooperation, start with a strong signal and progress to a weaker one as circuits are adjusted. The third harmonic of a 2-meter rig can be used, but be sure that you have tuned in the desired frequency, not a spurious product of the oscillator or multiplier stages. A reliable indication of any improvement can be had by monitoring the age voltage developed by the signal, whatever its source.

A standard reference for minimum usable signal in ATV is the lowest level at which the receiver's horizontal oscillator will lock the signal in. With a well-peaked average front end, this will be somewhere between 5 and 10 μV. A good preamplifier can bring the usable level down to around 1 μV, which will really help in reception of all but the stronger local signals.

RF Preamplifiers

One rarely finds top performance in either uhf or vhf home TV, in part because of the wide tuning ranges that must be covered by the rf circuitry. We are interested in a relatively narrow band, so a simple transistor preamplifier for the ATV frequency can help. Up to 20 dB gain is readily obtainable, with a noise figure well below that of the best manufactured home TV sets. A real joy in ATV is reception of clear high-definition pictures. A low-noise rf amplifier will extend the range over which such reception is possible.

The inexpensive rf amplifier shown in Fig. 2, originally appeared in *The Radio Amateur's VHF Manual*, Edition 3, Chapter 13. Improvements made recently provide better stability under varying load conditions, and higher rejection of out-of-band signals. A 9-volt supply is recommended, whereas the earlier version used 12. In this form the preamplifier will be less susceptible to over loading from a 2-meter rig running in the immediate vicinity, which may be important in ATV communication. For still better suppression of your own TVI from 2-meter operation, add a simple strip-line filter in the line to the ATV receiver. (Suitable filters are described in all editions of the *VHF Manual*.) If insertion of a strip-line filter affects picture definition adversely, try tapping the input and output directly to the inner conductor instead of using coupling loops.

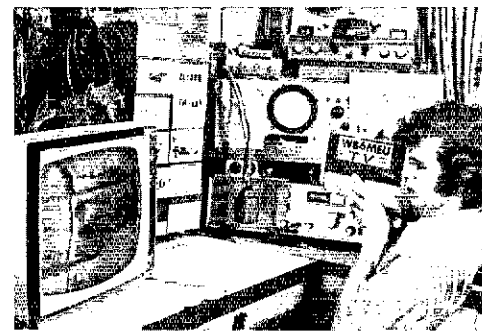
The amplifier is assembled on a single-sided circuit board 2-1/4 inches square, with a simple 3-pad pattern that can be etched, milled or cut with a sharp knife. The only critical item is to keep bypassing leads as short as possible. Ready-made boards and completed preamps ready for use are available from W6ORG.[2]

Requirements as to noise figure are not as critical in ATV work as in weak-signal DX communication. Any reasonably good rf stage will help any conventional uhf TV front end. By contrast, most receivers and converters used for 432-MHz communication are likely to be rather good already, and improving them appreciably takes some doing.

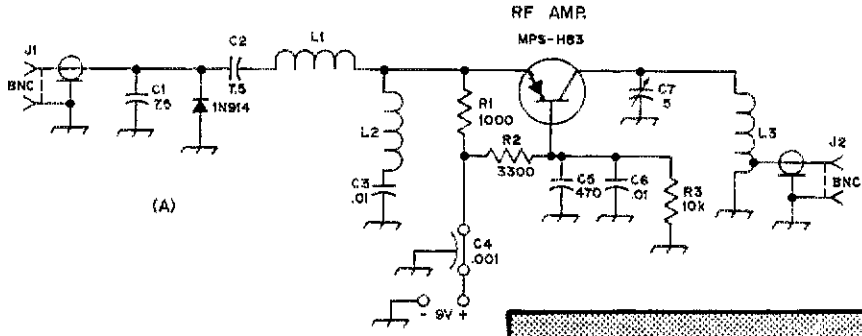
Conversion to Coaxial Input

Most home TV equipment is designed for 300-ohm balanced input. Conversion to coax and unbalanced input is desirable in ATV work. This requires modification of the TV set's uhf input circuit, also a must if an rf amplifier is to be used

[2] Ready-made circuit boards are available for the rf preamplifier, video modulators, and fm subcarrier generator. Send stamped self-addressed envelope to the author for further information.



ATV need not be all test patterns and tweaking. Here WB6MEU focuses on some choice DX QSLs from stations worked on the hf bands.



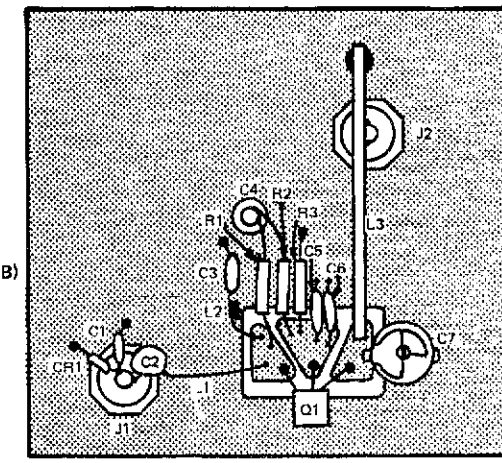


Fig. 2 — Schematic diagram and parts information for the W6ORG preamplifier, for use with uhf ATV receivers. Parts not described are numbered for text reference and identification in the layout, B.

C1, C2 — 7.5-pF disk ceramic. Lead to C2 makes L1.

C3 — .01-μF disk ceramic. Lead to C3 makes L2.

C6 — Subminiature variable, 1 to 5 pF (Johnson 187-0103-005).

L1 — 3/4-inch lead, C2 to emitter pad.

L2 — 3 turns, 1/8-inch dia., in lead from C3 to emitter pad.

L3 — 2 inches No. 20 wire 3/8 inch above and parallel to board surface. Tap for J2 at 1/2 inch from ground end.

effectively. If there is no room to install a coaxial connector on the uhf tuner, the direct-connection method, Fig. 3, is recommended.

Drill a hole large enough to pass the coax inner conductor and its insulating sleeve, at a point that will permit direct connection to the first section of the tuner as shown. Tap the inner conductor on the input circuit, adjusting the tap position in 1/16-inch increments for best response to a test signal. Precise adjustment will not be important if a preamplifier that is stable under varying load conditions is used, but optimum tap position will be desirable if the antenna feeds the tuner directly. Tinning the surface of the tuner around the hole, and also the coax braid, will help in getting a good clean bond at this point.

Warning: this grounded-input arrangement is usable only with receivers which do *not* have "hot" chassis. Also, watch for ungrounded input circuits in simple tuners having no preselection circuit (two-section tuning capacitor instead of three). If yours is a two-section front end, be sure that the low end of the mixer line is grounded directly to the frame, before installing the direct antenna connection described. In a mixer with a biased diode the cold end of the mixer line may be insulated from ground, in which case a series capacitor must be used to couple the antenna to the line. If there is room, use a small trimmer; if not, experiment with fixed values and various tap positions.

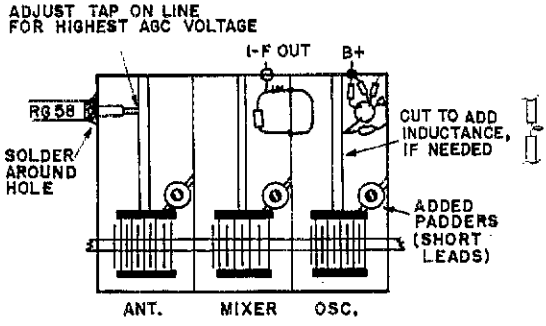


Fig. 3 — Typical uhf TV tuner, modified for coaxial input.

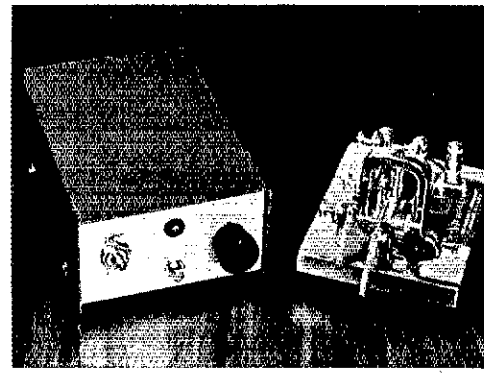
Antennas and Transmission Lines

It has been said many times, but nowhere is it more important than in the ATV station: cutting costs by using cheap transmission line is false economy. Published tables indicate that Twin-Lead may have lower loss than coax, but adverse effects of weather make the advantage largely illusory, even if the convenience of coax is ignored. Equally important is the choice of coax, after the balanced-vs-unbalanced argument is settled in favor of the latter. Beware of bargains in coax. They may have inadequate shield-braid density, which you can

(Continued on page 39)

An Integrated

KEYER/TR SWITCH



BY JAMES H. FOX,* WA9BLK

THE AUTHOR has always preferred to work full break-in cw, which, once used, is never forsaken voluntarily. However, the usual problems with electronic T-R switches, signal suck-out and other ills, have led to other solutions. The excellent article in *QST* of July, 1964,[1] outlining the use of reed relays, forms the basis for the switching functions described here.

In addition, a desire to go to an electronic keyer after several years off the air led to a perusal of the article by WØZHN and KØUXQ in *QST*.[2] While similar in spirit, the keyer that evolved does not much resemble that one, in that more readily available TTL instead of RTL integrated circuits are used here, necessitating a complete redesign of the circuit. However, the original features of the WØZHN/KØUXQ keyer, including self-completing characters and exact dot/dash/space timing, have been preserved. More important, a dot memory has been added, after a brief period of operation using a keyer without this feature convinced the author of its desirability. Best of all, the final unit uses mostly parts that are readily available at Radio Shack stores throughout the country.

Basic Keyer Circuit

As shown in Fig. 1, the keyer itself consists of four sections: a timing circuit (U1), a dot generator and output stage (U2A), a dot memory (U2B), and a dash generator (U3A and U3B). U1 is a 74121 monostable multivibrator, while U2 and U3 are 7473 dual *J-K* flip-flops. This design provides for simple construction, a stable time base, and complete freedom from the double-dot problem often associated with dot-memory keyers.

The heart of the keyer is the timing circuit, which generates a continuous series of pulses so long as either the dot or dash lever is pressed. As shown in Fig. 2A, the basic timing interval consists of a timing pulse followed by a reset pulse. When the key is pressed, the 74121 monostable multivibrator (U1) generates the timing pulse, its length determined by the timing circuit R1-C1, where R1 is the speed control of the keyer. The output of the multivibrator is coupled back to the input by C2, producing the reset pulse which retriggers the circuit so long as the key remains closed. R2 is included to prevent loading down the Q output of U1, while CR1 serves to discharge C2 between reset pulses. In effect, we thus have a free-running multivibrator.

It is a tendency of keyed timing circuits to have a first pulse that is either longer or shorter than the following pulses. This is because the timing components need a period of transition between the static and dynamic operating states. In this circuit, CR1 very quickly discharges C2 during the timing pulse, so that it has reached its steady-state operating condition before the end of the first timing pulse. Further, the reset pulse occurs relatively slowly, as C2 recharges through R2 and the input circuit of U1. This gives C1 time to recharge between timing pulses, so that the second timing pulse sees essentially the same charge on C1 as the first timing pulse. As a result, the pulse-width stability at all keying speeds is better than 5% (typically half this amount) between the first and all following pulses. (In the author's opinion, a difference less than 10% is negligible.)

The $\bar{Q}$ output of U1 is coupled to the clock inputs of U2A and U3A. The Q output of U3A in turn is coupled to the clock input of U3B, forming the dash generator. When a dot is sent, U3B is held in the clear state ($\bar{Q}$ output high) through R3. This allows U2A to change state on every negative-going clock-pulse transition, creating equally spaced dots

* 1 Lt., USAF, 2187 Comm. Gp. (AFCS), PSC Box 815, APO NY 09293. U. S. address, 200 Kewanna Dr., Jeffersonville, IN 47130.

[1] "A Keyed Antenna Relay," *QST*, July, 1964, p.29.

[2] Halverson and Stordahl, "An Integrated Circuit Electronic Keyer," *QST*, April, 1968, p. 22.

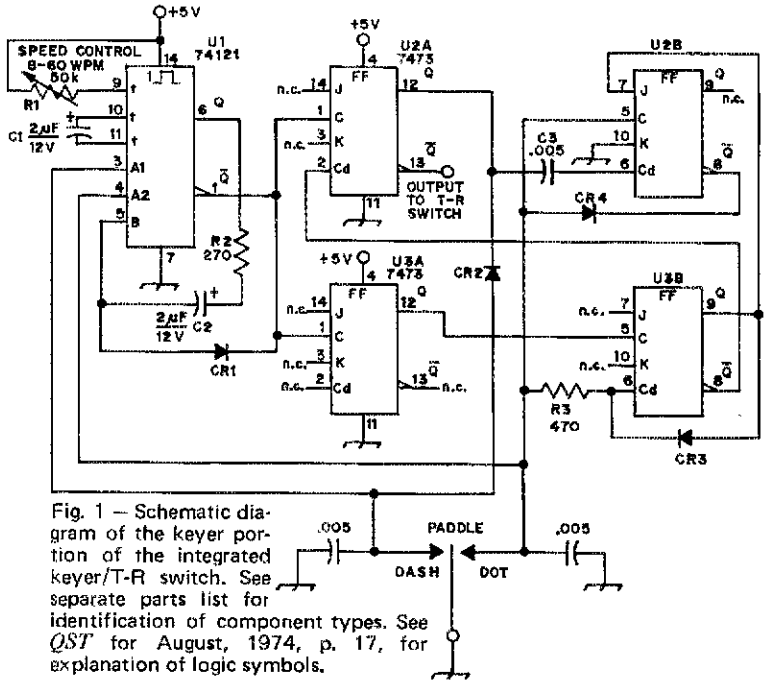


Fig. 1 — Schematic diagram of the keyer portion of the integrated keyer/T-R switch. See separate parts list for identification of component types. See *QST* for August, 1974, p. 17, for explanation of logic symbols.

and spaces so long as the dot lever is pressed; see Fig. 2D. Note that although U3A is also being triggered at this time, U3B is not allowed to be triggered, so that the dash section is not active at this time.

However, when a dash is sent, U3B is allowed to be triggered also, since it is no longer being held in the clear state. The result is that U3B is triggered every other time that U3A is triggered; see Figs. 2B and 2C. By holding U2A in the clear state through the $\overline{Q}$ output of U3B, we thus create a dash exactly three times the length of a dot, followed by a space exactly one dot interval long. Thus, perfect character timing is obtained; see Fig. 2D. CR3 holds the clear input of U3B at a high voltage state (uncleared) while a dash is being sent. This prevents keying of a dot during this time from clearing U3B, so that the dash can complete itself.

The Q output of U2A is in the low voltage state whenever a character is being sent. This is fed back to the timing generator U1 through CR2, so that the generator keeps running until the character is completed. Thus, all characters are self-completing, once triggered. The $\overline{Q}$ output of U2A forms the output of the keyer, and is fed to transistor Q1 of the T-R switch to drive the switching circuitry.

Dot Memory

The fourth section of the keyer, U2B, is the dot memory. This allows one to key a dot at any time, even if a dash has not yet completed. The dot is held in memory, and keyed out automatically after the dash completes itself. Without the memory, the dot would be lost unless the key were held in the dot position until the dot actually started. This greatly facilitates the sending of letters which have a single dot at the end, or a dot surrounded by dashes. The lack of this feature may explain why so many choppy CQs are heard, as the operators have learned to pause slightly before starting the dots.

The operation of the dot memory can be outlined as follows. If a dash, or a space following a dash, is being sent, U2B will be triggered from the clock input if the dot lever is pressed then, placing the dot in memory. However, if no dash were being sent when the dot lever was pressed, the dot would not be put in memory, but would be keyed out immediately. If a dot is put in memory, the $\overline{Q}$ output of U2B is low, which keeps the

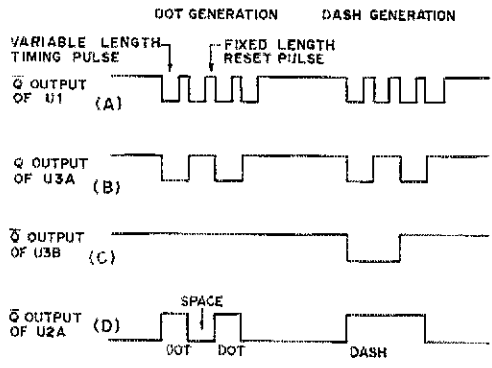


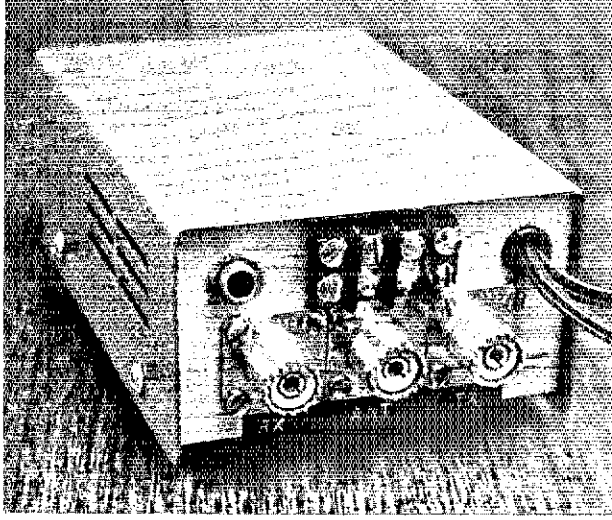
Fig. 2 — Timing waveforms of the keyer. See text.

timing circuit running through CR4. Through R3, this also holds pin 6 of U3B low, assuring that the next character will be a dot. The memory is cleared by a negative pulse through C3 as the dot starts, returning $\bar{Q}$ to the high voltage state.

This method was adopted after considerable experimentation with other designs, which often erroneously put dots into memory and produced double dots at the output. As with most other dot memories, these earlier designs put a dot in memory every time the dot lever was pressed. Then a pulse was applied to clear the dot memory as the dot began. However, if the contacts on the key bounced after the clear pulse had passed, another dot would be put in memory, creating two consecutive dots at the output. The usual cure for this is simply to delay the clear pulse until all the contact bounce is over. However, this still leaves the door open to bounce as the contacts break, since no amount of delay can compensate for this. With ICs that switch in only 20 nanoseconds, any bounce at all would cause problems, so another method had to be found.

It was then noted that double dots can occur only when the contacts bounce while a dot is being sent, since the clear pulse has already passed. Bounce on the dot contacts during a dash is no problem, as the clear pulse does not come until much later, when the dot actually starts. This is fortunate, since a little thought will reveal that the only time it is necessary to put a dot in memory is when a dash, or the space following, is being sent. At all other times, dots should be prevented from being put into memory. Then, the dot contacts can bounce all they want, without producing double dots.

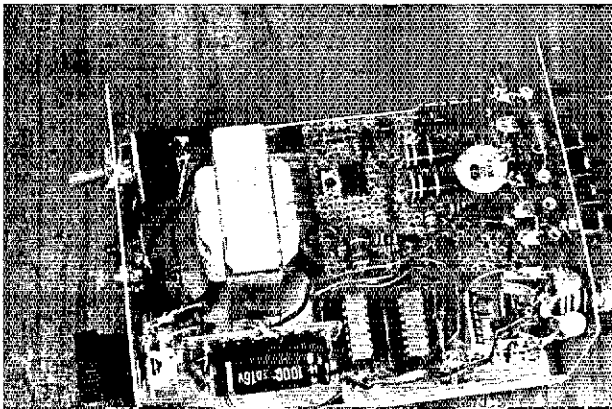
To understand how this is accomplished in this memory, it is first necessary to understand some of the peculiarities of the 7473 IC, which is a master-slave type of flip-flop. In addition to the usual rules of operation for *J-K* flip-flops, the 7473 has the interesting feature that the *J* or *K* inputs can effectively be set to the low state only when either the clock or clear input is low. For instance, if the *J* input is high while both the clock and clear are high, simply grounding the *J* input will not cause it to go to the low state internally. Then, if a clock pulse comes along, the flip-flop will obey the appropriate switching rule as though *J* were still high. This holds for only the first clock pulse however, since a clock pulse will put the clock



On the back of the unit are mounted the rf connectors, external keying terminals, and key jack. The ac power line and transmitter keyed line pass through the grommet at the right.

input in the low voltage state. The *J* input is then set internally low for all following clock pulses, until the external *J* input goes high again.

This feature allows us to realize the goal of allowing dots in memory only during dashes or their spaces in a particularly simple manner. Referring again to Figs 1 and 2C, note that when a dash starts, the *J* input of U2B is put in the high state by Q of U3B. (Note that *K*, being grounded from the start, always stays in the low state.) The external *J* input goes low in the midst of the dash, but that is no matter: *J* will internally remain high until either the clock or clear input goes low. Thus, if a dot is keyed anytime after the start of a dash, U2B will be triggered from the clock input, and a dot will be put in memory ($\bar{Q}$ output goes low). If the dot is keyed during the dash or its space, the dot will remain in memory until the dot actually starts. However, if the dot is keyed *after* the space following the dash, the dot will effectively be blocked from memory. This is because the *J* input will go low internally (it is already low externally) a few nanoseconds after the clock input is keyed low. Also, the clear input is held low for several microseconds as C3 recharges through the clear input of U2B. This combination assures that any contact bounce is locked out of memory until the next dash comes along.



On the circuit board are mounted the T-R switch circuitry at the top, and the keyer circuitry at the bottom. The .01-μF rf bypass capacitors are mounted on the rear terminal strip, and the .005-μF capacitors on the key jack. (See text for proper placement of ICs on the circuit board.)

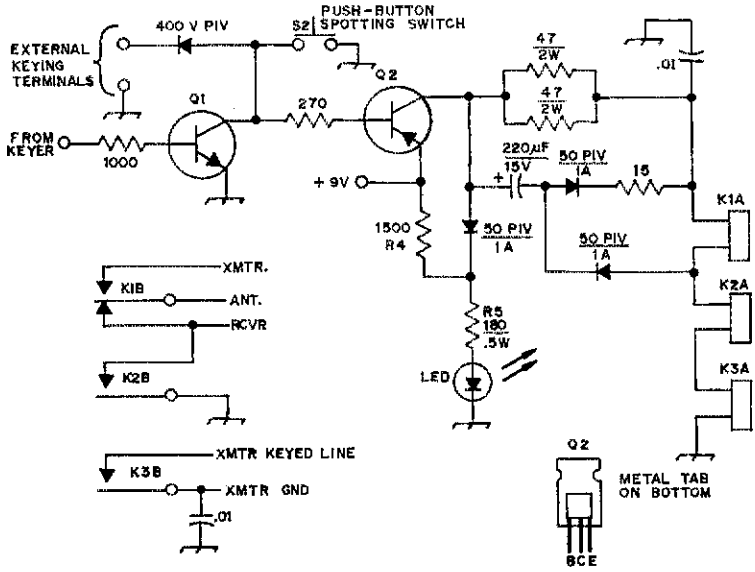


Fig. 3 — T-R switch of the integrated keyer/T-R switch. See separate parts list for identification of component types. Relay coil-winding data, for No. 32 enam. wire:
K1 — 400 turns, pull-in current 140-150 mA.
K2, K3 — 120 turns, pull-in current 140-150 mA.

It seems that every new keyer that comes along claims some new keying characteristic, requiring a descriptive name. This keyer is simply an improved version of the basic dot memory keyer, in which the logic of the circuit completely eliminates double dots due to contact bounce. Thus, after a wholly impartial search for a name, I have decided to call this technique BounceLess Keying, or BLK for short.

T-R Switch

The T-R switch consists of driver transistors Q1 and Q2, and reed relays K1 through K3; see Fig. 3. This circuit not only switches the antenna from the receiver to the transmitter with relay K1, but grounds the receiver input with relay K2, and keys the transmitter with relay K3. Both grid-block and cathode-keyed transmitters can be used, as the contacts on K3 are rated at 500 mA. If a grid-block transmitter with a large capacitance on the keyed line is used, some authors recommend the use of a 220-Ω resistor in series with the relay contacts to prevent sticking contacts. However, I have not found this necessary with my rig.

The coil turns for each relay are wound directly on its glass case, and covered with a coat of epoxy cement for protection. After some sad experiences with mounting the relays on the perforated board along with the rest of the components, the technique of soldering them to terminal strips evolved so as to protect the delicate leads. To bend the leads, be sure to grasp them with a pair of long-nose pliers between the bend and the glass case. When soldering the No. 32 enameled wire, simply heat it first with the iron to burn off the insulation.[3] These terminal strips are then mounted on the back of the chassis, with K1 as close to the coax connectors as possible.

An oscilloscope check of the current in the relay coils shows that it reaches the switching threshold in much less than a millisecond after keying. Thus, the speed is limited only by the mechanical characteristics of the relays, which are quite fast. No speed limitations should be encountered for any practical keying speeds.

[3] [EDITOR'S NOTE: This technique may be used with some of the newer types of enamel-coating material, but older types may require that the insulation be sanded or scraped off before the wire can be soldered.]

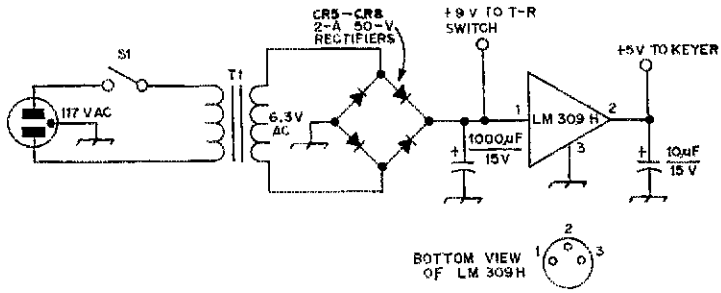
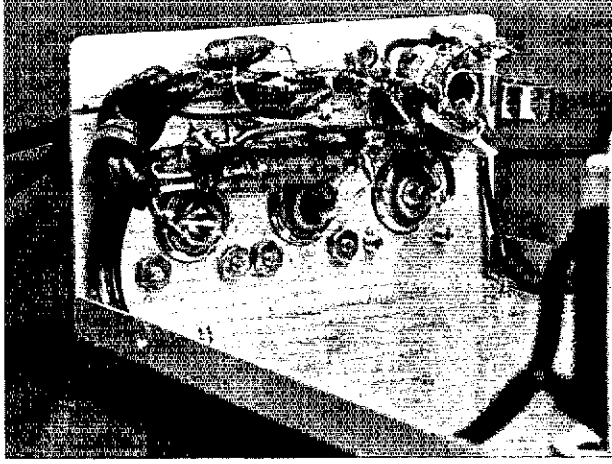


Fig. 4 — Power supply for keyer/T-R switch. See separate parts list for component identification.



Details of the relay placement show how K1, the antenna relay, is mounted on the bottom terminal strip between the transmitter and antenna coax connectors. The transmitter keying relay, K3, is mounted on the top terminal strip, while the receiver grounding relay, K2, is soldered directly to the receiver coax connector at right. *(All photos by author)*

One word of caution: when I had the antenna relay K1 originally mounted alongside the keyer integrated circuitry, rf from the transmitter interfered with the keyer at power levels above a few watts. With K1 mounted at the coax connectors, and the windings bypassed with a .01-μF capacitor, this problem was solved. However, the rf leads to K1 should be kept *short*, on the order of 1/2 inch, and should be soldered to the relay right at the glass body. It would also be wise to mount the integrated circuits on the side of the circuit board away from the antenna relay, with the transistors and T-R circuitry between them. The increased spacing should eliminate any further possibility of RFI in the ICs.

As other authors have emphasized, it is necessary to switch the antenna relay on just before the transmitter is keyed, and delay it from turning off until slightly after the transmitter is turned off. This is necessary to prevent keying hot rf in the antenna relay, which would produce key clicks. In this circuit, antenna relay K1 turns on so quickly that the delay through K3 and the transmitter prevents keying hot rf in K1. This has been checked using two samples of K1, and two of K3, which shows that the results are reproducible. However, an oscilloscope check showed that antenna relay K1 tended to shut off at the end of a character before the transmitter output dropped to zero, cutting off the "tail" of the keyed rf waveform. This was easily solved with the 220-μF capacitor, which delays the turn-off of K1 about 10 milliseconds. A further scope check showed no change to the leading or trailing edge of the waveform with or without K1. Thus, if your transmitter doesn't have clicks now, this won't add them.

Power Supply

The power supply, shown in Fig. 4, is a conventional full-wave bridge circuit with capacitive filtering for the T-R switch circuitry. An LM309H integrated-circuit regulator provides the correct voltage for the IC keyer. This device gives truly outstanding regulation, assuring highly stable keying, and is internally protected from overcurrent conditions or overheating. However, if you should encounter unusually low line voltages, below about 105 volts, it would be a good idea to add another 1000-μF filter capacitor at the input of the LM309H. This will assure proper regulating action down to line potentials well below 100 volts, should this be necessary. At the output of the LM309H is a capacitor to prevent switching spikes generated by the TTL ICs from interfering with the proper operation of the keyer. Any capacitor of 5 μF or greater value will work here, so use what you have on hand.

Other Circuitry

The two terminals of the barrier terminal strip mounted on the rear of the chassis permit keying the T-R relays from an external switch, such as transmitter relay contacts when on phone. They can also be connected directly across the coil of this relay, or across a push-to-talk switch. The 400-volt diode in series with these contacts protects transistors Q1 and Q2 from any voltage present in the external circuit, such as switching spikes across a relay coil. The push-button switch on the front panel also keys the T-R relays, and is used for tuning or spotting the transmitter. The light-emitting diode is used as a keying monitor. When the ac power is applied, it glows dimly; when a character is keyed, it glows more brightly. The resistors shown are optimized for the FLV100 LED; if you use the MV5020, reduce the value of R4 to 1000 Ω, and the value of R5 to 100 Ω.

If you prefer, as I do, to monitor your own signal off the air, the T-R switch is complete as shown. The signal attenuation provided by relay K2 during transmission will allow a receiver with a good age circuit to monitor without overload. However, if you wish to add additional muting circuits or key an audio monitor, more relays can easily be added. Simply wind them the same as K2 and K3, and connect them in series with the windings on K2 and K3.

Of course, if you wish to build just the keyer itself, you need just one keying relay. As shown in Fig. 5, this can be accomplished with just one transistor, if you wind twice the number of turns on the relay as before. A commercial relay could also be used if you don't wish to wind your own. However, due to their much higher inductance, you will need to add a diode (1N914 or similar) across the relay windings to assure quick turn-off of the relay. Connect the anode to the

Parts List

RS = Radio Shack *PP = Poly Paks*

All resistors in schematic diagrams are 1/4 watt unless otherwise noted. Capacitors are in μF; those marked with polarity are electrolytic.

U1	74121 monostable multivibrator	RS 276-1814 or PP SN74121
U2, U3	7473 dual *J-K* flip-flop	RS 276-1803 or PP SN7473
CR1-CR4	1N914 silicon switching diodes	RS 276-612 or PP 50U143
Q1	Npn silicon type (as 2N2222) I_c: 250 mA min.; beta: 30 min.	RS 276-2009 or PP 2N2222
Q2	Pnp silicon power type (as 2N6109) I_c 1 A min.; beta: 15 min.	RS 276-2025 or PP 92CU1446
K1	Spdt reed switch, 3" long	RS 275-202 or PP 92CU1257
K2, K3	Subminiature spst reed switch, 1" long	RS 275-033 or PP 87U655
LED	Light-emitting diode, type FLV100 or MV5020	RS 276-026 PP 92CU1339
T1	6.3 volt ac transformer, 1.2 A	RS 273-050
S1	Ac toggle switch	RS 275-602
S2	Miniature push-button switch	RS 275-1547
—	Metal case 4 × 2-3/8 × 6"	RS 270-252
—	14-pin IC sockets	RS 276-027 or PP 92CU1308
—	No. 32 wire	RS 278-011
—	5-volt regulator, LM309H	PP LM 309H

Miscellaneous: 50-kΩ timing pot (see text), SO-239 chassis connectors, two-terminal barrier strip, perforated circuit board, 6-lug terminal strips, two-conductor phone jack, metal standoff spacers, rubber grommets, knob, minor hardware. (All available at Radio Shack if you don't have them in your junk box.)

47-Ω-resistor side of the coil, and the cathode to the +9 V side.

Conversely, the T-R switch only can be built, and keyed through the external keying circuit. For use with a transistor output keyer however, increase the value of the base resistor of Q2 to 390 Ω to limit the external current to a safe 16 mA.

Operation

The antenna relay has been used with a 150-watt input (85-watt output) transmitter for several months with no ill effects. This level will be quite adequate for the average barefoot exciter running up to a couple of hundred watts, and can probably be exceeded if the SWR isn't too high. However, I would not recommend a kilowatt into this unit. See the articles in *QST* of December 1964[4] and February 1973[5] for details of higher power operation.

The 50-kΩ timing pot allows operation from about 8 to 60 wpm. However, I find a speed range greater than about 3 to 1 somewhat critical to adjust. Therefore, I actually use a 22-kΩ pot in series with a 3300-Ω fixed resistor, giving a more tractable range of 12 to 35 wpm. You can adjust these values to suit your taste.

If you use dual paddles, dots will take precedence over dashes. Thus, with the dot memory, you can insert a single dot between dashes by merely touching the dot lever.

(Continued on page 52)

[4] "High Power Version of the Keyed Antenna Relay," *QST*, December, 1964, p. 20.

[5] Lawson, "High-Speed Break-In via a Keyed Vacuum Relay," *QST*, February, 1973, p. 13.

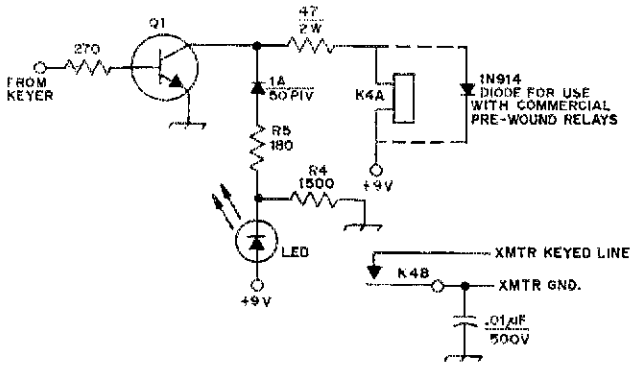
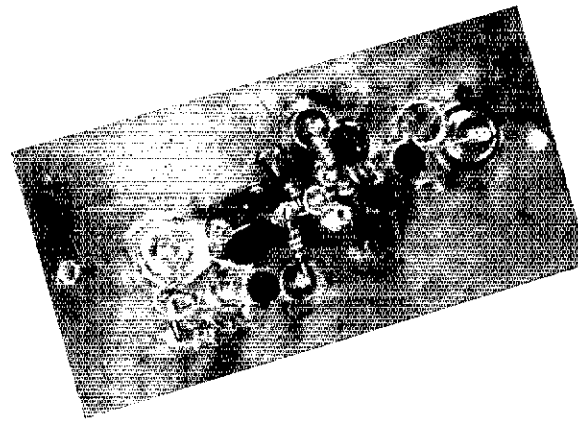


Fig. 5 — Circuit for keying transmitter if T-R switching is not desired. See separate parts list for component identification. K4 coil-winding data: 225 turns No. 32 enam. wire, pull-in current 75-80 mA.

An Inexpen$ive Low Noise Preamplifier for 432 MHz



Simplicity of construction makes the preamplifier a short-term project. Small standoff insulators support most of the components. The transistor is upside down in the center of the board. Leads to be grounded are soldered direct to the copper foil. BNC connectors are used for input and output connections; input is on the left. Two feedthrough capacitors bring +9 V from the other side of the pc board.

BY STEVEN A. MAAS,* K3WJQ

THIS AMPLIFIER was developed as part of a low cost 400-MHz radiotelescope. Although it does not represent the ultimate in low-noise operation, its performance is much better than many commercially made units, and the cost and simplicity are hard to beat. The circuit uses a 2N5652 transistor, although a 2N5651, 2N5650, or K6007 can be used for better noise performance. The author's unit has 12-dB gain and a noise figure of less than 2 dB – 1.5 dB has been obtained with a selected transistor.† The total cost can be less than $20.

If greater gain is desired, the amplifier can be modified by changing the operating point of the transistor. According to the manufacturer of the 2N5652, a 5- to 8-dB increase is possible, and greater signal handling ability and linearity is achieved as a bonus. The cost of this gain improvement is an increased noise figure.

Circuit Description

The circuit is a basic common-emitter amplifier, with tuned input and output circuits. It has some attractions that are not obvious from the schematic. Neither neutralization nor shielding are needed, in spite of the high frequency and high gain, because of the low input impedance of the transistor. The amplifier should be unconditionally stable, even when mistuned. Also, because the 50-ohm transmission line is in parallel with the input tuned circuit, wide-band response is obtained. In environments where interference is a problem, the input connection and transistor base may be tapped lower on L_1, narrowing the bandwidth.

Power is supplied by a 9-volt source, preferably a small transistor radio battery. Current drain is only 3 mA. A 12-volt Zener diode is connected across the power connection to protect the transistor against excessive voltage and improper supply polarity. The maximum V_{ce} of the 2N5652 is only 20, and the device is not very forgiving.

To protect against lightning damage (if the unit is mounted at the antenna, as it should be) some means should be employed to ground the antenna. The old trick of connecting two diodes across the input will not protect the delicate base junction of the 2N5652, and will appreciably increase the amplifier noise figure.

Construction

The amplifier is built on a 2 × 4-inch (51 × 102 mm) piece of copper-clad printed circuit board, using miniature ceramic insulated terminals. Holes

* 1220A Holmes Ave., Charlottesville, VA 22901.

†[EDITOR'S NOTE: A representative of KMC Semiconductor was consulted about the noise figure obtained by the author. His opinion was that it is not impossible to have a 1.5 dB noise figure if using a selected 2N5652; most are capable of providing 2 dB. For consistent results a K6007 is recommended, which can produce a 1.6-dB figure.]

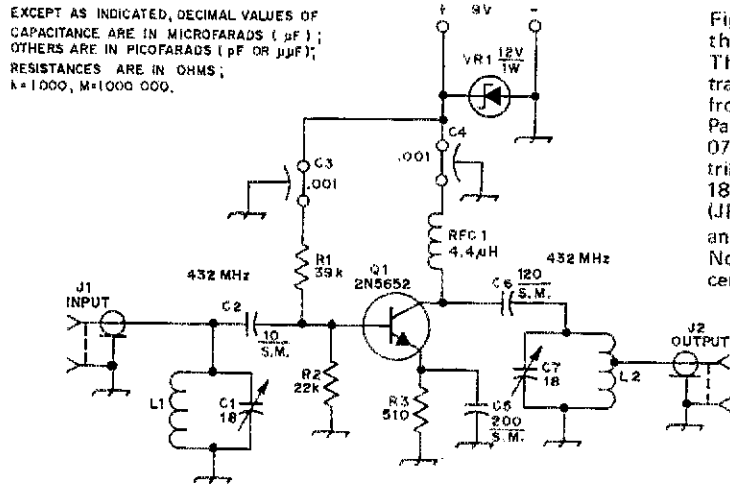


Fig. 1 — Schematic diagram of the 432-MHz preamplifier. The 2N5652 or K6007 transistor may be obtained from KMC Semiconductors, Parker Rd., Long Valley, NJ 07853, or from their distributors. C1 and C7 are 2- to 18-pF glass piston trimmers (JFD VC-4G or equiv.). L1 and L2 are 1 turn 3/8-inch dia. No. 16 tinned copper; L2 is center tapped.

are drilled in the board for all mounted components; where ground connections are needed, the leads are simply soldered to the board. This type of construction results in the shortest possible lead length for all components, and is very simple to do. The amplifier may be fastened to the open side of an aluminum chassis to form a compact, well shielded unit.

The inductors should be installed so their leads are as short as possible, but keep the coil at least 1/4-inch from the copper surface or from other components. The transistor should be installed last and soldered carefully. Do not bend its leads close to the body, or they may break.

Adjustment

The amplifier is adjusted for maximum gain using a signal generator or a received signal. The collector current should be checked and set to the value which gives best noise figure; this will be very close to 3 mA. The collector current can be varied by changing the values of the base resistors, R_1 and R_2 or by varying the supply voltage by no more than ±2 volts.

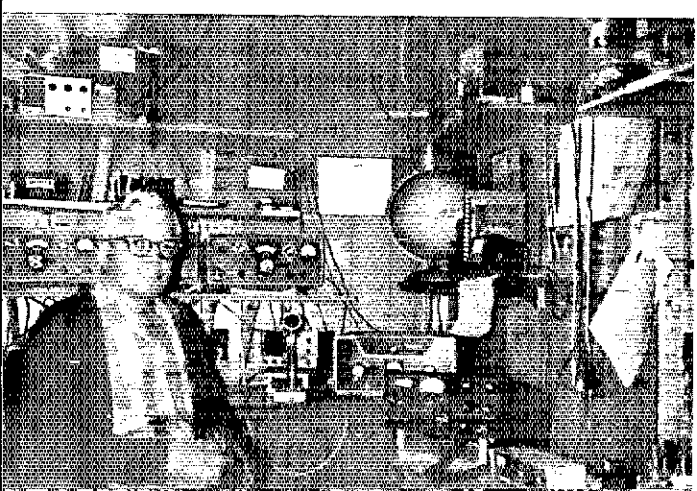
It may be necessary to trim the inductors in order to achieve a smooth passband response. For best results, the input inductor should be connected from ground to the center pin of the input connector, and C_1 should be connected to the same point by a short wire. The bandwidth is also affected by the value of C_2; increasing this value by a few pF will broaden the frequency response.

If oscillation should occur, be sure the transistor leads, especially the emitter lead, are well soldered and as short as possible. Oscillation is usually caused by poor construction practices, bad grounds, or poor layout.

To improve the gain, at the cost of noise figure, the base resistors R_1 and R_2 should be changed, to increase the collector current to a maximum of about 10 mA. R_1 may be replaced by an rf choke with a small potentiometer connected in series, to make the bias point variable.

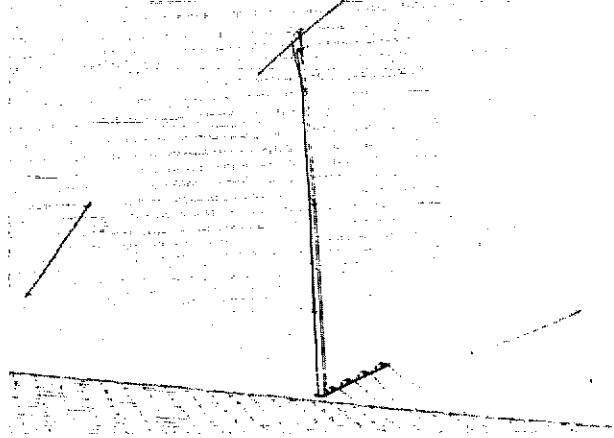
There is no reason why this circuit cannot be used at 220 or 144 MHz, with even better performance. All that would be needed is to change the input and output tuned circuits and increase the value of C2 slightly. QST

Strays



Every Monday WA7IKZ sends text taken from *QST* at 5, 8, 10 and 15 wpm. He has helped about 40 Novices get licenses, having also conducted classes in the past. George was also a leading light in the KD7SPO show station at Spokane's Expo.

A Simple Fixed-Direction Quad



BY RUDOLPH J. BACHER,* WA3JYI

IN MANY instances an amateur has a need for an antenna that must be homemade, simply because what is needed isn't available commercially. In my case I had special antenna requirements that could only be realized by "rolling my own."

First, I needed an antenna that was inconspicuous. Second, the antenna must have gain and directivity (toward Europe). I remembered an article in *QST*[1] that provided the information for an inconspicuous antenna, but it didn't have much gain or directivity. The article proved a good starting point. The completed antenna more than meets my needs and might be of interest to other hams. I call it a fixed-wire quad.

My quad requires no spreaders or boom, and only one supporting mast. See Fig. 1. This was ideal for me since I already had a mast for a center "sky hook" for 80- and 40-meter dipoles. Also, in this design, the wire elements for the quad become part of the guying, an added feature for efficiency.

Construction Details

For 20 meters a 40- to 50-foot telescoping mast is needed. If roof mounting is planned, a 30-foot mast would be high enough. An 8-foot section of aluminum with plastic insulators was used for the top and bottom of the quad to separate the driven element from the reflector. An 8-foot bamboo section was used on each side of the quad. Certainly, many variations of separators would work, including wooden dowel or Fiberglass. Quarter-inch nylon rope was used for guying and to open the quad elements. The amount of nylon rope needed depends on the height of the antenna. The higher the quad, the more rope will be required to spread the quad and to guy it. In my case, the total weight for the wire, rope and four separator sections was about six pounds. This

(Continued on page 49)

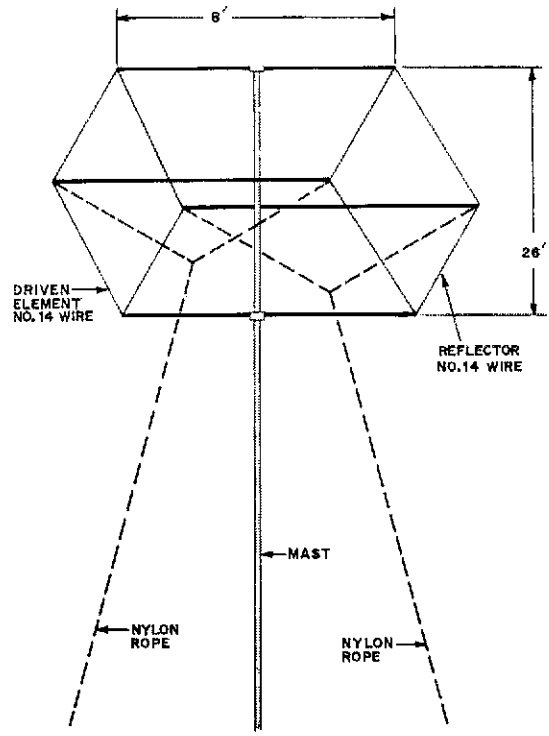


Fig. 1 — Details for the fixed-wire quad.

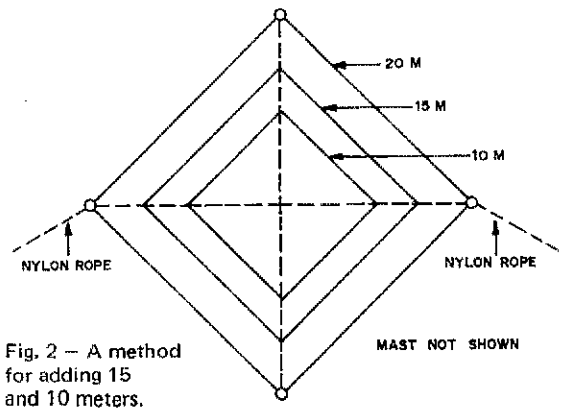
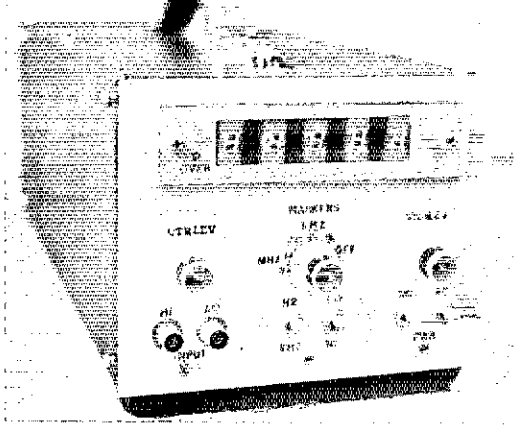


Fig. 2 — A method for adding 15 and 10 meters.

* 209 Mendell Place, Llangollen Estates, New Castle, DE 19720.

[1] Ruckert, "A Triband One-Loop Cubical Quad Element," *QST* March, 1969.



Part I

BY ARLO R. EGGENSPERGER,* W2TJZ

FREQUENCY COUNTER - a MODULAR approach

THIS ARTICLE describes what the author believes to be a simple approach to building a frequency counter. Here is a way to do it yourself in easy stages during which you can have the benefits of both a good secondary frequency standard and of a limited-range counter. Each stage can be tested as you progress, using the previously built sections as part of the test gear. The method suggests the use of plug-in circuit cards to reduce the rather extensive job to "small bites."

Another advantage is that you can make expenditures in four stages, with increasing benefits at all stages except one. Upon completion, you will have a counter with which you should be familiar, making it easier to use or to cope with difficulties. The counter has the following characteristics:

- A range of 1 Hz to 200 MHz.
- 8-digit readout with 8-digit capacity.
- An accuracy of several parts per million, ±1 digit (±10 Hz when using the prescaler).
- A secondary frequency standard with markers at 5 and 1 MHz, 100, 10 and 5 kHz.
- Plug-in circuit cards that permit ready access to many test points.

In addition to the above, the selection of marker frequencies is arranged so that the switch contacts are not in the rf path. Therefore, these frequencies can be remotely controlled at a bench, for instance, by adding six leads and an additional switch.

The building-block type of construction contemplates four stages, as follows:

In stage 1, the cabinet, power supplies, oscillator, time-base chain and frequency marker selection portions are assembled and tested. For an expenditure of about $50 you will have a secondary frequency standard of high quality and accuracy, and a time base for your counter.

In stage 2, the low-frequency input, input selector, time-base selector, control circuits, count-enable and overflow portions are added on three circuit cards. The cost is about $17. The secondary standard remains intact and is used in checking out this stage.

In the 3rd stage, the five light-emitting-diode readouts are mounted on a single card with 35 current-limiting resistors and installed in the cabinet. The counters, latches and decoders (five identical cards, each having three ICs) are assembled and checked out.

This has cost about $50 more but you have completed the low-frequency portion of your counter with a range up to 20 MHz. Depending upon your requirements, you may elect to go no further. At prices in effect on August 1, 1973, you have spent about $120 for material. Judicious purchasing, maximum use of parts on hand and less expensive readouts could reduce this figure.

In the fourth and final stage you will be assembling the prescaler consisting of an amplifier and divide-by-10 integrated circuit on a single card. Thus, an additional expenditure of about $23 has increased the range of your counter to 200 MHz.

Circuit Description

Fig. 1 is a block diagram of the counter. The figure numbers within the blocks refer to the detailed schematic drawing numbers.

Briefly, the counter functions as follows: Assume you are feeding an audio signal of 12,345 Hz into the LO-input connector, with the LO-HI switch in the LO position. The signals follow a path through the 20-MHz input-selector circuits to

* 101 Christie St., Tenafly, NJ 07670.

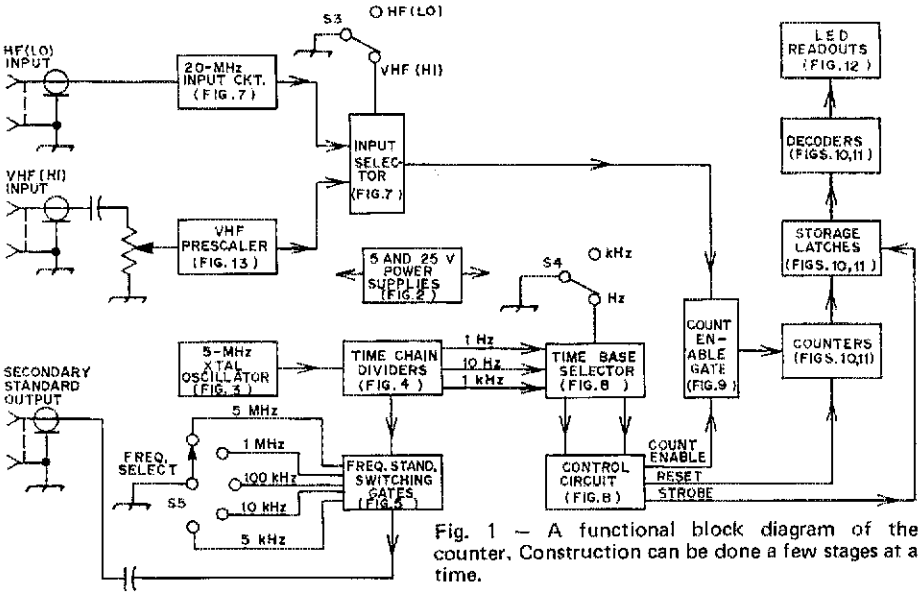


Fig. 1 — A functional block diagram of the counter. Construction can be done a few stages at a time.

the count-enable gate. When the HZ-KHZ switch is in the HZ position, *the control circuits open the gate for one second.*

The count-enable gate allows the pulses to enter the counters where they are tallied. Signals from the control circuits cause the count to be transferred to the storage latches where it is held while the counters make the next count. The output from the storage latches goes to the decoders, which, in turn, cause the digits 12,345 to be displayed. The control-circuit timing pulses play a very important role. Frequencies of 1-kHz, 10 Hz and 1 Hz are involved, and are derived by dividing down the accurately adjusted 5-MHz crystal frequency. This is the purpose of the time-base chain.

It is evident that if the gate is open for 1 second, the readouts will display the frequency in cycles per second, or hertz. However, if the HZ-KHZ switch (S4) is moved to the KHZ position, the control circuit opens the count-enable gate for one millisecond instead of one second. This is one one-thousandth of a second, and therefore the count will only be 12 (±1 count). The viewer mentally multiplies the result by 1000.

The control circuits furnish timing pulses for strobing the digits out of the latches into the decoders and for resetting the counters to zero. These pulses — count enable, strobe and reset — are generated in that order, continuously.

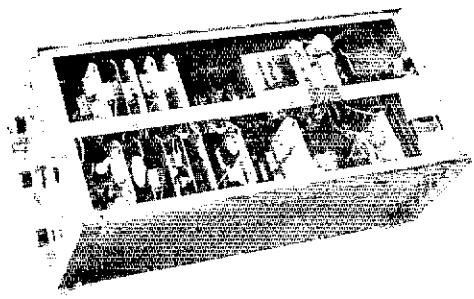
Operation of the HI-LO switch (S3) to HI and the insertion of a frequency of 145.320 MHz in the HI-input connector brings the prescaler into use. The prescaler divides this frequency by 10 before feeding it into the input selector. From there it is processed the same as above. However, since there are only 5 digits in the readout, the display is only accurate to ±10 Hz. The frequency displayed would be 145.32 MHz.

The MARKERS switch (S5) permits the selection of 5- or 1-MHz, or 100-, 10-, or 5-kHz frequencies for injection into a reciever for calibration purposes. If you have a sideband transceiver (no carrier transmitted), this can be of help in setting your transmit frequency also.

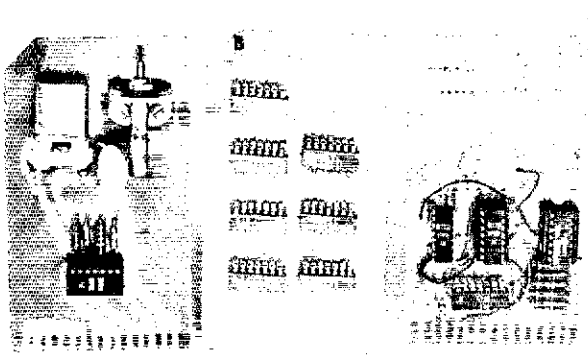
This brief description may leave some questions. However, additional details will become evident in the testing section.

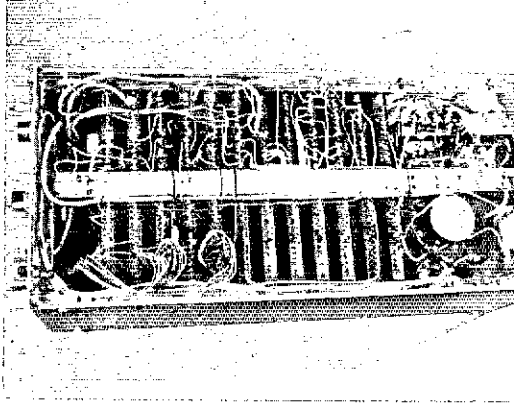
Mechanical Layout and Construction

Stage 1 — decide on the style and size of the cabinet. My cabinet is about 6 × 7 × 15 inches in size and was constructed by covering a surplus switching-system drawer with sheet aluminum. It is



Components for the 5-volt supply are located in the right rear, with a heat sink for the regulator just visible behind the diodes. The 25-volt power supply assembly is on a card in the left compartment; the transformer is visible opposite the letter B on the center strip.





Left photo: Cards A, B and C contain components for the crystal oscillator, the time-base chain, and the frequency-standard output-selector circuits, in that order. No patterns are given, as the author used an ink-resist pen to draw the circuits prior to etching. It should not be difficult to duplicate the layout with any of the popular methods of pc-board fabrication. Right photo: The bottom of the cabinet can be removed to allow access to wiring between the connectors. Some connectors are installed but have no cards in them. The frame is a surplus switching-system drawer, converted to a cabinet by covering it with sheet aluminum.

large enough to be expanded to an 8-digit counter. The bottom is removable to gain access to the terminals on the Amphenol jacks.

Substitutes should not be used for the transistors specified in the 5-volt supply, Fig. 2. This combination holds the 5-volt output within 5% regulation (the IC requirements) between 0.2 and 1.75 amperes. Allow adequate ventilation for the heat sink. The counter requires about 1.75 amperes with the prescaler and 1.5 amperes without it. None of the 5-volt supply components are card mounted. The photographs show an AC and a DC power switch. This was done to provide full-time ac power for a 6-volt crystal oven which the author intends to install later.

The 25-volt supply is not required until the circuit of Fig. 7 is built. However, the space required and the location should be planned initially. I placed the supply on a card but this is optional.

Oscillator and Time Base

The parts shown in Fig. 3, the 5-MHz oscillator, should be rigidly mounted for good stability. The frequency-corrector capacitor (C1) can be located where it is convenient to adjust.

The circuit of Fig. 4 contains seven 7490 dividers. Plan their location carefully to minimize crossovers. Where they cannot be avoided, use insulated straps.

An idea of parts placement may be obtained from study of the photographs of the plug-in cards. There is nothing particularly critical about any of the boards except the vhf prescaler. Boards can be fabricated by use of any of the popular methods, including photoetching, ink-resist pens, tape strips, or whatever is convenient for the builder. Indeed, the perf-board or Vectorbord approach would apply as well. It is recommended that the plug-in feature be maintained since it is a definite aid in troubleshooting or later changes in circuitry.

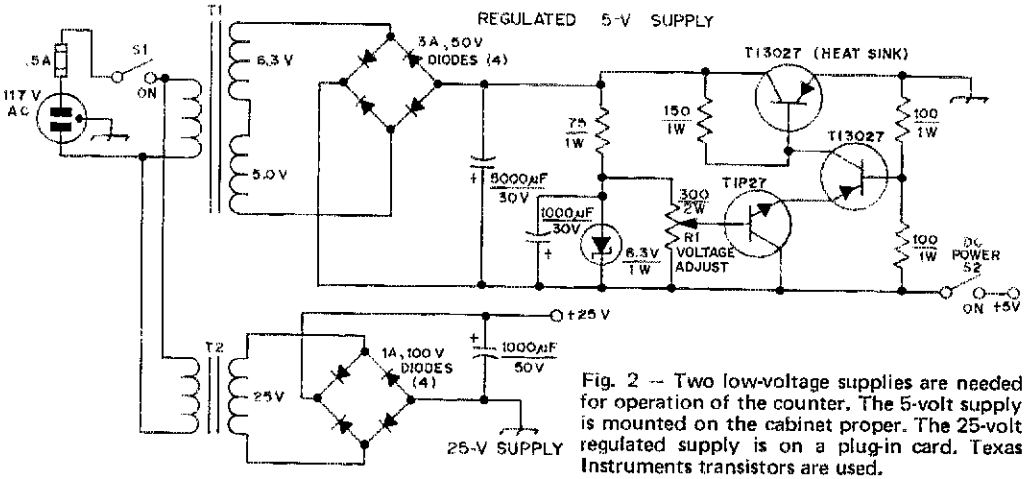


Fig. 2 -- Two low-voltage supplies are needed for operation of the counter. The 5-volt supply is mounted on the cabinet proper. The 25-volt regulated supply is on a plug-in card. Texas Instruments transistors are used.

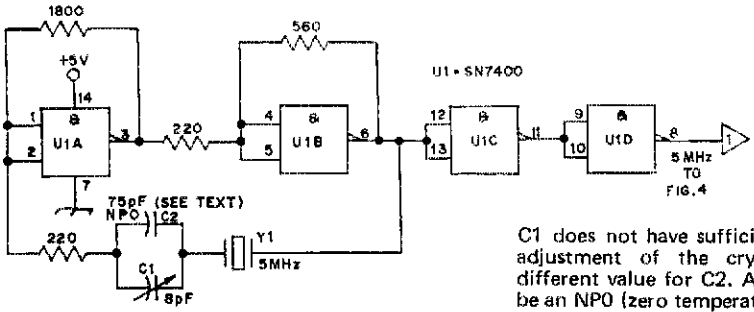


Fig. 3 — The crystal oscillator is the heart of the instrument. Y1 should be a 5-MHz, AT-cut, series-resonant unit. If ordered from International Crystal, 10 N. Lee, Oklahoma City, OK 73102, specify HA-2.05-5 MHz. If C1 does not have sufficient range to allow proper adjustment of the crystal frequency, select a different value for C2. Any substitute here should be an NPO (zero temperature coefficient) unit. This circuit is on card A in the photograph.

Back issues of *QST* have included some excellent articles on the fabrication of printed circuit boards.[1,2,3,4] I used single-sided copper-clad boards, Calectro GC Electronics 22-220 resist pen, 22-224 etch resist lacquer and 14-628 printed-circuit etching solution.

Care should be taken to insure that the contact fingers on the end of the board line up with the springs in the 143-015-02 Amphenol socket. You can use a piece of Vero board already drilled, with holes on 0.1-inch centers, as a template for the ICs. An alternative is to drill a piece of metal with 16 holes in the proper spacing and use it as a template to drill all holes for the Molex socket pins.

The BNC connector, J3, shown in Fig. 6, was mounted on the rear of the cabinet. I have not yet extended the selection control to a remote location. It would appear that feedthrough capacitors or ferrite beads would minimize leakage of rf from the cabinet.

I found it to be advantageous to do all the drilling and the removal of the burrs and oxide prior to applying the resist. This can be done with fine steel wool, water and a detergent.

Testing and Adjusting

At the completion of each stage it is necessary to interconnect the Amphenol sockets to complete the circuitry. Assuming the use of 15-terminal sockets, Fig. 6 shows how the terminals are assigned and interconnected for stage 1.

Before inserting the cards in the sockets adjust the 5-volt supply output to exactly 5 volts by means of R1. With the aid of a VTVM or scope, check for the presence of signals at the following terminals:

Crystal oscillator, terminal F = 5 MHz.
Zero beat this signal with WWV at 10 or 15 MHz by adjusting C1.

Time base chain, terminal N = 5 MHz.
terminal P = 1 MHz.
terminal R = 100 kHz.

[1] DeMaw, "Etched-Circuit Boards," *QST*, January, 1970.
[2] Hints and Kinks, "Easy Printed-Circuit Layout," *QST*, June, 1970.
[3] Anderson, "Fabrication of Printed-Circuit Boards," *QST*, October, 1971.
[4] Rathbun, "Making Two-Sided Circuit Boards by the Photoetching Process, *QST*, August, 1974.

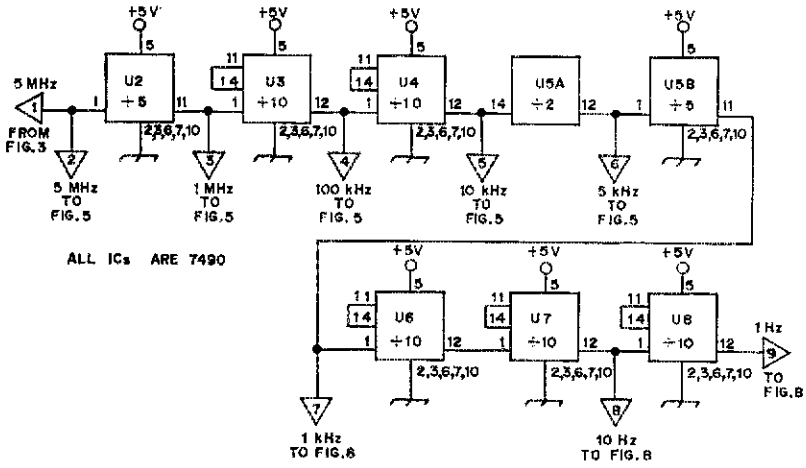


Fig. 4 — The time-base chain consists of frequency-divider ICs to provide drive and timing pulses. This circuit is assembled on plug-in card B in the photograph.

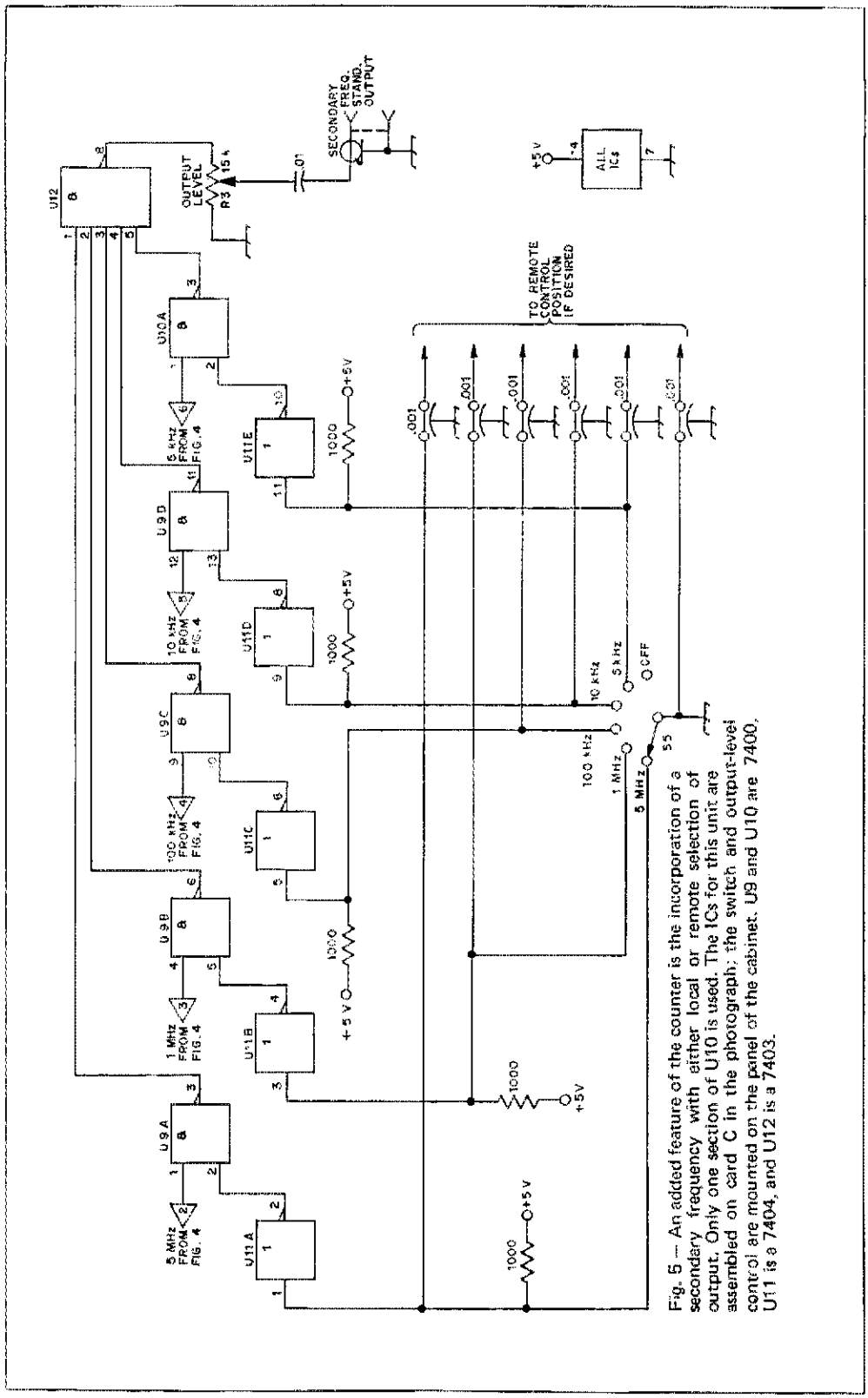


Fig. 5 — An added feature of the counter is the incorporation of a secondary frequency with either local or remote selection of output. Only one section of U10 is used. The ICs for this unit are assembled on card C in the photograph; the switch and output-level control are mounted on the panel of the cabinet. U9 and U10 are 7400, U11 is a 7404, and U12 is a 7403.

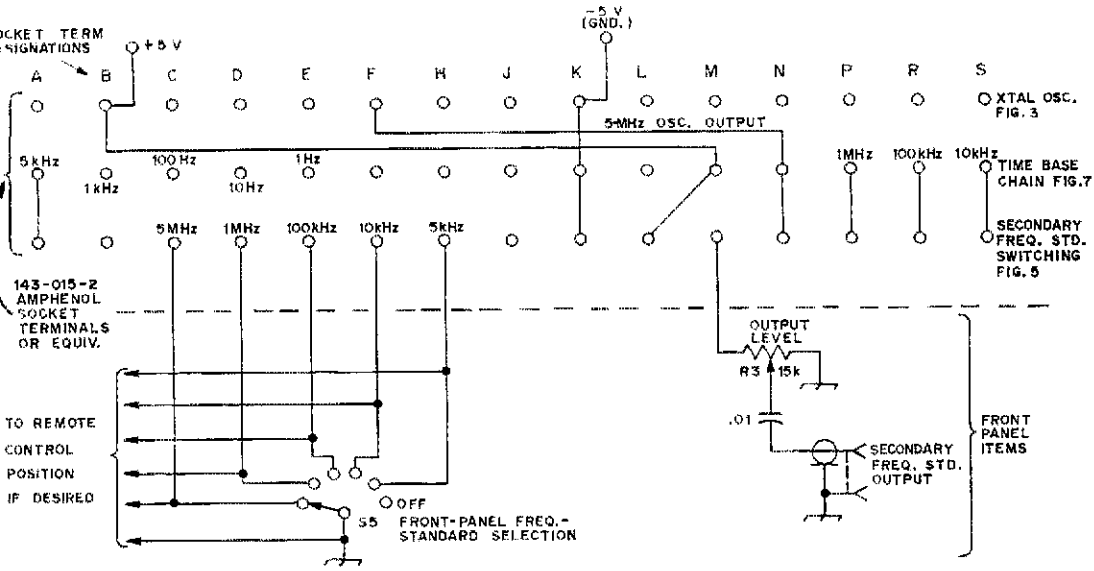


Fig. 6 — An example of wiring needed between sockets for the plug-in cards. For a remote control switch to function properly, the local frequency standard selector switch must be in the OFF position.

terminal S = 10 kHz.
terminal A = 5 kHz.

If you have no problems at this point the above frequencies should be accurate within a few hertz. A lack of signals indicates a problem on the associated card or interconnections. Problems should be cleared up by replacing or substituting ICs or verifying the accuracy of the wiring and/or the quality of the soldering. Move the VTVM or scope probe to the secondary-standard output terminal M and verify that these signals can be selected from the front-panel switch. The output-level control should also function.

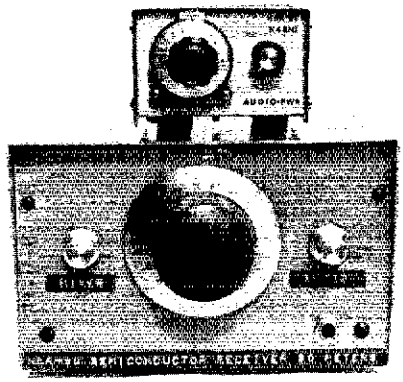
The foregoing is an example of the technique that may be used to check each stage as it is completed. You will need to assign terminals on each card for interconnection to another card as indicated on the schematic diagrams. This assignment will permit a cross-connection sheet to be made for wiring between jack terminals prior to testing.

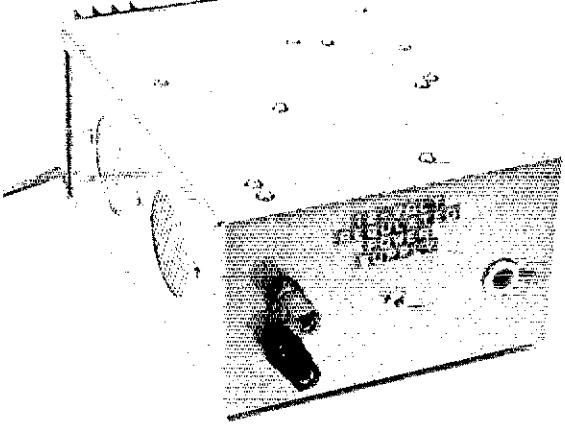
Part II of this article will cover input circuitry, input and time-base selector circuits, as well as control, count-enable, and overflow portions of the assembly. QST

Strays

Considerable mail has been received at ARRL Hq. concerning the fun and good results our readers have been experiencing with the little 80-meter ssb/cw receiver described in the 1974 *QST* beginner's series on semiconductor applications. This writer recently worked WB4HQE on 40-meter cw. He was using the beginner's receiver with a 40-meter converter, and reported excellent copy. With tongue in cheek, so it seemed, he reported his use of a T4XC as the transmitter!

The photograph shown here was submitted by Dick McIntyre, K4BNI, who enjoys building his own gear. The illustration shows two versions of the *QST* beginner's receiver. The smaller of the pair is evidence of his ability to "scrunch" lots of parts into a restricted area. The larger unit uses a crystal-controlled BFO. Dick reports equal results with the *LC* VFO described in the series. His latest effort is an audio amplifier and speaker, which he has built into a mating cabinet to match the smaller receiver. It is refreshing to see the results of home-construction efforts in this day of commercialization. — *WICER*





A No-Junkbox Regulated POWER SUPPLY

BY ED KALIN,* WA1JZC

HAVE YOU ever had the desire to build a project, only to find that the necessary parts were either difficult or impossible to obtain? Cheer up! Things are not quite as bad as you think they are. When a regulated power supply capable of operating a 10-W 220-MHz fm transceiver from 117 volts ac was needed, all of the parts were rounded up locally in an hour and a half of shopping (including travel time) with stops made at only two stores. There was no problem with back-ordered parts, exorbitant minimum order limits, or painfully long shipping times. Every part of the power supply, from the IC voltage regulator to the No. 6 hardware, was purchased new for under fifty dollars including 6 percent Connecticut sales tax. In any metropolitan area large enough to support a TV-service parts distributor and a Radio Shack store it should be possible to duplicate this power supply at the same cost or less. The power supply was designed to provide up to 2 amperes continuously at 12 volts, although the output voltage may be adjusted internally within the range of 9 to 13 volts with the circuit constants shown in Fig. 1.

Circuit Description

Up to point A in Fig. 1, the circuit is a fairly conventional step-down transformer, full-wave bridge rectifier, and capacitor-input filter. The use of two transformers, rather than one, allows a certain degree of flexibility of operation, in that the supply may be used on either 117 or 235 volts ac with only minor differences in wiring. The dc voltage at point A is approximately 30. Q1 is used as a series pass transistor. Its function is to drop the voltage at point A of Fig. 1 to the desired 12-volt output value, and maintain that voltage over wide variations in the output load current. U2 is an integrated-circuit voltage regulator which, with the aid of a few external components, is capable of handling up to 600 mA of output current. Since an output current of 2 A is desired, however, U2 is used here to properly bias Q1, which has a much higher current rating. The inner circuitry of U2* can be divided into four basic elements: a fixed voltage reference, a variable voltage reference derived from the fixed reference, an error amplifier, and an output regulator. An internal Zener diode is used as the fixed reference. This reference voltage is applied to one input of a differential amplifier (a differential amplifier responds to the difference between two applied voltage levels), while the other input is connected to the junction of R3 and R4 (pin 8 of U2). R3 (in series with R2) and R4 form an externally adjustable voltage divider, from the differential amplifier output (pin 9 of U2) to ground. Thus, the output of the differential amplifier will swing to the level that results in the voltage at pin 8 of U2 being identical to the fixed reference voltage.

A second differential amplifier serves as the error amplifier. One input (pin 6 of U2) is tied directly to pin 9, while the other input (pin 5 of U2) is connected to the power supply output bus. The error-amplifier output controls the internal output-regulator bias of the IC, which in turn controls the bias applied to Q1. When connected in this manner, the error amplifier responds to any difference between the power supply output level and the (previously adjusted) voltage reference level. The output regulator acts on Q1 to correct the discrepancy. C3 and C4 are used in the interest of maintaining amplifier stability. R5, R6, R7, and Q2 are included in the circuit to protect the power supply and regulator in the event of an inadvertent short circuit between the output terminals or if the current demanded by the load is too heavy for safe operation. The operation of the current-limiting feature is as follows: When the current flowing through the parallel combination of R5, R6, and R7 (equivalent parallel resistance of about 0.18 ohm) is large enough to produce a 0.6-volt drop across the resistors, Q2 is biased into conduction. The action of Q2 on the IC internal output regulator results in the reduction of the current through Q1. The short-circuit output current in this case will be limited to 3.3 amperes (0.6/0.18 = 3.3), which is within the safe regulator/pass-transistor limits. The value of the current-sensing resistance required for short-circuit currents of other than 3.3 amperes is calculated as follows by Ohm's law: $R_{sc} = 0.6/I_{sc}$ where R_{sc} is the current-sensing resistance and I_{sc} is the maximum allowable short-circuit current. If a long run

* Laboratory Technician, *QST*.

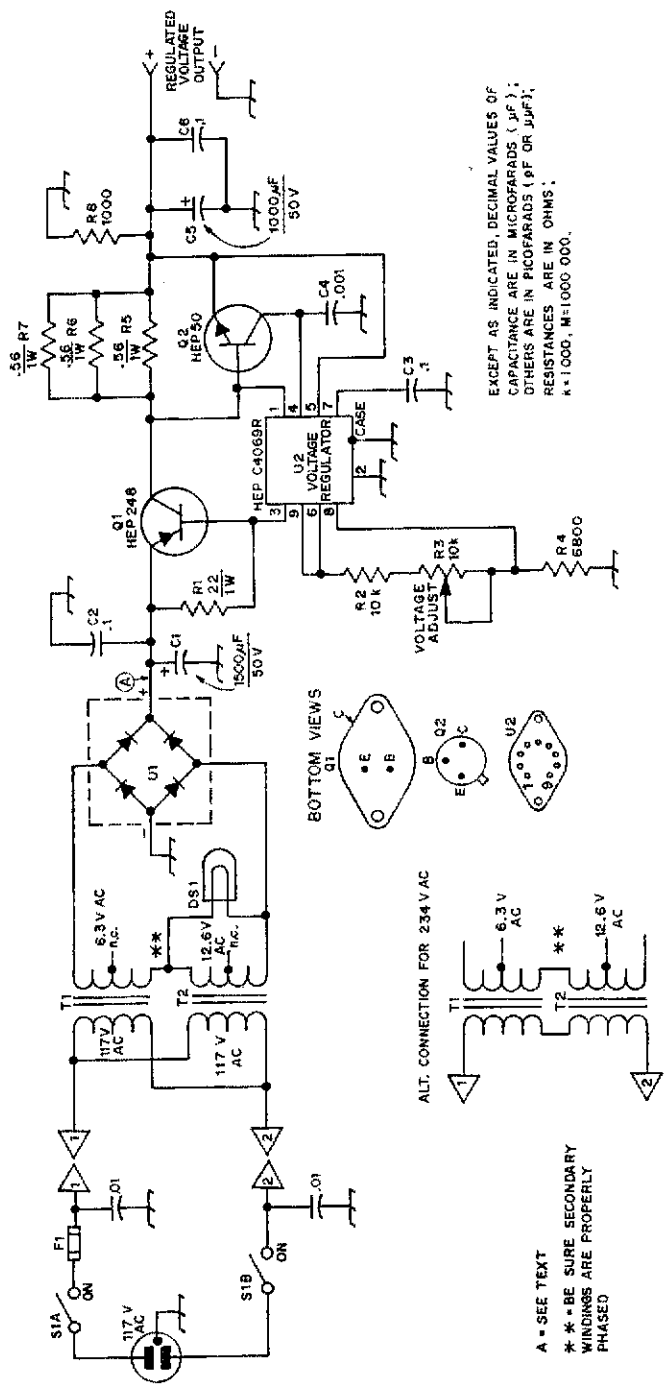


Fig. 1 — Circuit diagram for the power supply. Unless otherwise noted, all resistors are 1/2-watt composition. Component designations not listed below are for text reference and circuit-board layout purposes. Capacitors are disk ceramic except those with polarity marked, which are electrolytic.

C1 — 1500 µF electrolytic, 50 volts dc (Sprague TVA 1318).
C5 — 1000 µF electrolytic, 50 volts dc (Sprague TVA 1316).
DS1 — 12-volt pilot lamp.
F1 — 1.5 A, type 3AG fuse.
Q1 — Motorola HEP248 or equiv.
Q2 — Motorola HEP50, 2N706A, or equiv.
R3 — 10-kΩ printed-circuit-mounting pot (Radio Shack 271-218).
R5, R6, R7 — 0.56Ω 1-watt wirewound resistor (Radio Shack 271-072).
S1 — Miniature dpst toggle.
T1 — 117-volt pri., 6.3-volt ct sec. (ct unused), 3 amperes (Radio Shack 273-1510).
T2 — 117-volt pri., 12.6-volt ct sec. (ct unused), 3 amperes (Radio Shack 273-1511).
U1 — Full-wave bridge rectifier assembly, 50 volts, 10 amperes (Radio Shack 276-1156).
U2 — Motorola HEP C4069R, MC1469R, or MC1569R.

of cable is used between the power supply and the load, the voltage drop in the cable may be large enough to be of concern. If this is the case, a separate remote voltage-sensing wire may be run from the load to pin 5 of U2, rather than connecting pin 5 to the output at the power supply. The regulator will compensate for the voltage drop in the cable. This wire may be of a small gauge, as little current will be drawn through it.

Construction Details

In the author's power supply, most of the components were mounted on an etched-circuit

board (see Fig. 2), although point-to-point wiring on a "perf" board would have sufficed. As the transistors inside the IC are capable of operation at vhf, it is good practice to use short leads for interconnecting the regulator components to prevent unwanted oscillations from occurring. The manufacturer recommends a low-inductance connection between the case of the HEP C4069R and ground. No evidence of instability was noted with this circuit.

All parts are housed in an 8 × 6 × 3-1/2-inch Minibox (Bud CU-2109-A). Two standoff insulators support the pc board, while the power transformers, T1 and T2, are bolted directly to the Minibox. As Q1 dissipates several watts when maximum load current is being drawn, a heat sink is required. The Motorola HEP500, consisting of an MS-10 predrilled heat sink and an MK-15 power-transistor mounting kit, is ideal for this application. In accordance with the instructions supplied with the HEP500, the MK-15 socket is first installed on the heat sink. The mica washer included with the MK-15 should be coated on both sides with a thin layer of silicone thermal compound (Radio Shack 276-1372), with the bottom of Q1 and the center area of the heat sink treated similarly. After the Q1 emitter and base pins are inserted through the proper holes in the washer, the transistor is mounted in the socket. The mica washer insulates the case of Q1 (which is connected internally to the collector) electrically from the heat sink and chassis, while the silicone compound increases the thermal conductivity between Q1 and the heat sink. Care should be taken to prevent contact between the case of Q1 and any grounded object, as the full supply voltage appears on the transistor case. The current-limiting feature will not protect the device from destruction in event of an accidental short from Q1 to ground, since the current sensing resistors (R5, R6, and R7) are connected between Q1 and the power supply output terminals.

The heat-sink assembly is bolted to the rear panel of the Minibox with No. 6 hardware. The MS-10 is 3 inches high and 4-1/2 inches wide, so it must be located off center in order to accommodate the fuse holder and the line cord on the rear panel. A 1-inch-diameter hole was punched in the rear panel prior to the heat sink installation to allow access to the transistor socket pins. Short lengths of hookup wire are used between the pc board and the transistor socket. U1 is coated with silicone compound and then bolted to one of the inside walls of the Minibox, which serves as a heat sink for the diodes. Ventilation of the Minibox is desirable. Large holes punched or cut in the sides and bottom of the box and covered with perforated metal stock can be used, or ventilation

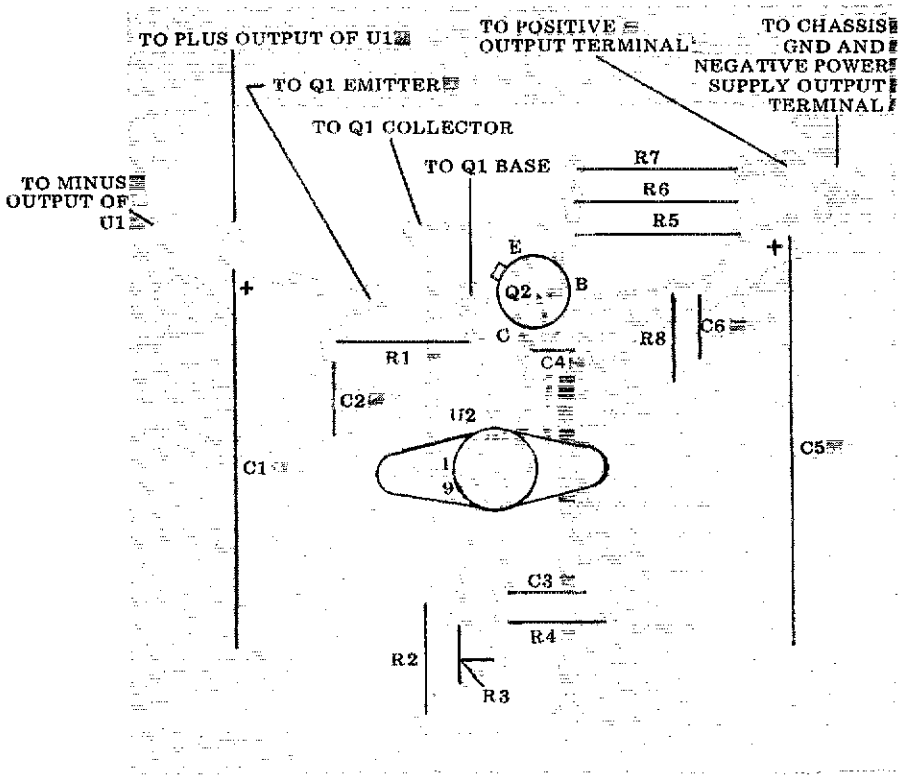
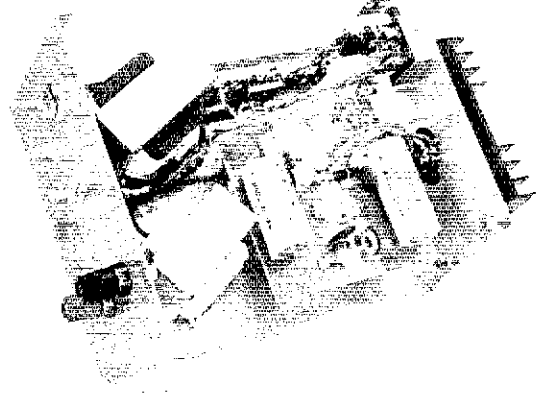


Fig. 2 — Foil pattern and parts layout for the regulated power supply.



Inside view of the no-junkbox regulated power supply. The use of the 4-inch-square pc board (visible in the right foreground) simplifies the interconnection of most of the parts. The full-wave bridge rectifier assembly (U1) and the heat sink for Q1 are bolted to the rear Minibox wall. T1 and T2 occupy the left foreground.

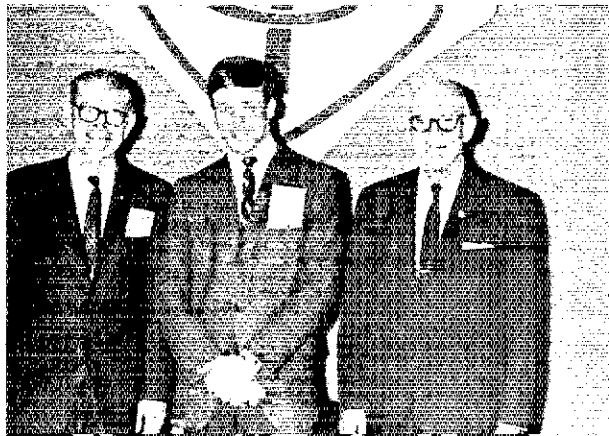
holes can be drilled individually in the metal enclosure. The regulator IC is mounted directly on the pc board, and it does not require a heat sink.

After the pilot lamp, the power switch, and the binding posts are installed on the front panel, T1 and T2 can be bolted in place near the front of the box. The transformer primaries can be tied in parallel for operation from 117 volts ac, or in series for 235-volt ac operation. The T1 and T2 secondaries must be connected in series and in proper phase for the power supply to operate correctly. If the unloaded ac output voltage as measured with a VOM is in the neighborhood of 20 volts, the windings are connected properly. If, however, the VOM reads approximately 6 volts, the secondaries are out of phase and the leads from *one* of the transformer secondaries must be reversed. If the primary leads are brought out to four separate terminal posts, changing from 117-volt to 235-volt operation will be a simple matter of changing appropriate jumpers. Alternatively, a 117/235 switch may be installed easily on the rear panel if frequent line voltage changes are anticipated. In either case, attention should be paid to the matter of proper phasing of the windings. The use of a 3-wire ac cord installed in a properly grounded outlet is intelligent practice for this and any line-operated power supply. If a transformer with a secondary rating of approximately 18 volts at 3 amperes is available, it may be used in place of T1 and T2. It is not advisable to use an unmodified 24- or 25.2-volt transformer to replace T1 and T2. The maximum allowable dc input voltage to U2 is 35 volts, and the unloaded output voltage of a 24-volt transformer, full-wave bridge rectifier, and capacitor-input filter exceeds this value. If such a transformer is on hand, it may be possible to remove turns from the secondary winding to bring the voltage down to within bounds. A Stancor P-8388 open-frame transformer rated at 25.2 volts and 2.8 amperes was tried as a "guinea pig" for this procedure. Removal of the outer protective wrapping revealed that the secondary was wound over the primary, and that it was possible to remove turns from the secondary without difficulty. The unloaded secondary voltage was measured (the unloaded voltage will usually differ from the listed voltage at the rated load) and then 10 turns were removed and the secondary voltage measured again. The new voltage was 2 volts less than the original voltage, giving a figure of 0.2 volts per turn for that particular secondary. It was then possible to calculate the number of turns to be removed in order to reduce the unloaded voltage to 20 volts.

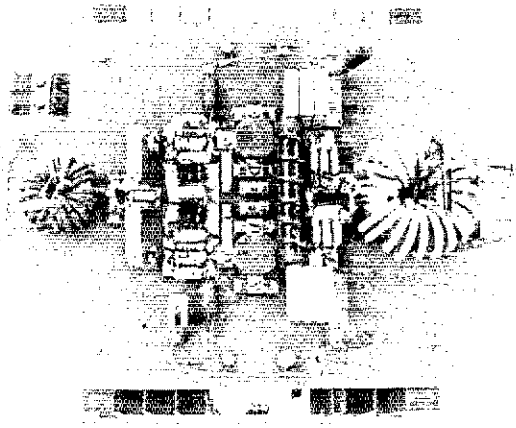
Operation

The supply as described will run continuously at 12 volts with 2 amperes of load current. The ripple voltage on the output is on the order of 30 mV peak to peak or less. If a higher output current is desired, (8 amperes, for example) the only limiting factors in the present components are the transformer current rating and the value of the short-circuit current-limiting resistors (R5, R6, R7), which can be adjusted accordingly. If it is desired to have front-panel adjustment of the output voltage, R3 may be replaced by a conventional pot. QST

Strays



Here are three generations of hams! Senior of the clan is W2KH (on right), former ARRL president; grandson WA4END (center); and, son-in-law, WA4UDB (left). Although not currently on the air, W2KH is residing at 131 Taggart Ave., Nashville TN 37205, and would like to hear from old friends.



Top view of the OZ1AM solid-state amplifier. Metal is removed only from this side of the circuit board; the bottom surface is left intact, as a ground plane. If the amplifier is driven from an exciter, rather than a transceiver, the input switching relay, upper left corner, will not be needed.

The limited power output available from solid-state amplifiers in the past has kept most amateurs from going all the way with transistors, except for low-power portable work. Even mobile setups have commonly used vacuum-tube final stages. Now, broadband amplifiers such as the one described here bring us the safety, simplicity, and overall efficiency of solid-state equipment, at power levels suitable for many home stations. This article is adapted from one originally appearing in the Danish magazine OZ, *for October, 1973. American readers, despite being unlikely to have exact-duplicate components, may find interesting and useful ideas in this European approach.*

100 Watts PEP Output with Power Transistors

BY AKSEL H. MATHIESEN,* OZ1AM

POWER TRANSISTORS developed in Europe by Philips, and in the United States by Motorola, make it possible to build solid-state amplifiers capable of up to 100 watts output, cw or ssb. With suitable heat-sinking, these transistors will stand infinite SWR, at temperatures up to 70°C, and dissipation levels up to 50 watts per transistor. Operation on all amateur frequencies from 3.5 to 29.7 MHz is possible without amplifier circuit switching or retuning in changing bands. Ideas for the amplifier were developed by Philips engineers Mulder and Hilbers. Tests were made with Type BLX14 transistors from Philips of Holland, and with Motorola 2N5942 transistors, obtained for this work through the E. Friis-Mikkelson Company of Copenhagen. The assistance and generosity of both companies are gratefully acknowledged.

Solid-State Amplifier Circuitry

Since a near-fatal encounter with a 2000-volt power supply in 1966, the author has worked almost exclusively with transistorized ham gear, never employing voltages in excess of 50 in amateur work. Though transistors seemed at times unpredictable, they have held a charm that vacuum tubes never did – and they are safe! The experience gained was not without its costs, however.

My first ssb exciter (also described in *OZ*, 1966-67) was capable of one-watt output. I still have it sitting on a shelf. I can't bear to part with it, because it represents so much money spent replacing transistors, burned out mainly because of improper circuit design. The output circuit was the familiar pi-network after the good old tube tradition. Because the pi-network is not well adapted to transistor service, the 2N3553 used in the output stage would suddenly draw excessive current, and go "fut" – at a cost I could ill afford. There were many of these expensive "futs" when the circuit was adjusted improperly, or the amplifier was not working into a proper load, and power transistors came high in Denmark in 1966!

Many modern transistors amplifiers use broadband circuits having toroidal inductors. From the schematic diagram, Fig. 1, it will be seen that this amplifier has a push-pull circuit. The transistors

* Hulvejen, Stokkebjerg mark, 4450, Jyderup, Denmark.

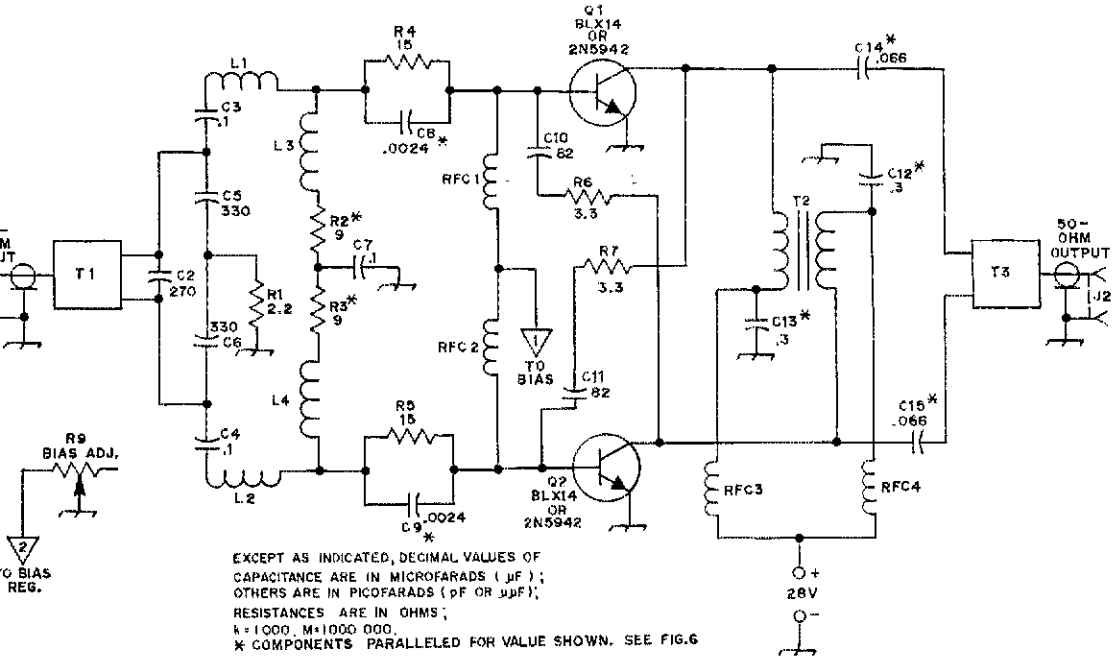


Fig. 1 — Schematic diagram and part information for the solid-state amplifier. Parts not described are labeled for text reference. Capacitors are ceramic, 50-volt or more. Resistors are 1/2 watt.

C8, C9 — Two .0012-μF in parallel.
C12, C13 — Three .001-μF in parallel.
C14, C15 — Three .022-μF in parallel.
J1, J2 — BNC connector.
L1, L2 — 2.5 turns No. 20 enam. closewound 3.2-mm (1/8 inch) ID. Lead length = dia.
L3, L4 — Same as above, but 4.2-mm (11/64 inch) dia. and lead length.
R2, R3 — Three 27-ohm in parallel.
RFC1, RFC2, RFC3, RFC4 — 2-1/2 turns No. 20 enam., Ferroxcube FX 1898 core.
T1, T3 — Toroidal balun transformer; see Fig. 5 and text.
T2 — 6 turns twisted pair No. 20 enam., wound on ferrite rod or tube, 7.7 × 50 mm. Nearest Amidon equivalent 1/2 × 4 inches. Cut to 2-inch length. Turn spaced about 1/4 inches apart. Coat with cement and bake at 150°C, 30 min.

should be a matched pair, for best performance and rejection of even harmonics. Maximum intermodulation distortion is 30 dB down. Gain at 100 watts output is 17 dB, and efficiency is 55 percent, at that level. VSWR does not exceed 1.4:1, from 3.5 to 30 MHz.

The input and output transformers, T1 and T3, are 4:1 baluns, wound with small 50-ohm coaxial cable on toroidal cores. Variations in transistor gain and input impedance are compensated for in LCR networks connected between the input transformer and the transistor bases. Neutralization is achieved through the use of 82-pF capacitors, C10 and C11, with 3.3-ohm resistors, R7 and R6 respectively, cross-connected in series base to collector, as seen in Fig. 1. These resistors help to prevent oscillation in the vicinity of 100 MHz, should the load be removed accidentally, or suddenly changed through antenna system damage.

The collector coupling transformer, T2, wound on a ferrite rod or tube, represents the closest possible coupling between the collectors. Center-tapping is avoided through use of separate windings, bypassed to ground by capacitors C12 and C13. The ferrite rf chokes in the dc lines, RFC1-2 and RFC3-4, prevent parallel resonance within the intended operating band, lowering the parallel-resonant frequency to below 1 MHz.

Bias-Current Regulators

A bias regulator, Fig. 2, is needed to prevent changes in the quiescent current in the amplifier that might occur with temperature variations. The sensor transistor, Q3, is thermally coupled to the solid aluminum block on which the amplifier transistors are mounted. The output voltage of the regulator is the sum of the base-emitter voltage of Q3 and the voltage across the control, R9. The original recommendation was for use of a 6.8-ohm control for R9. This was not readily obtainable, so a fixed-value resistor was used, its value having been determined experimentally to give a quiescent current of 140 mA. This should be controlled carefully. The capacitors C16, 17, and 18 are for rf decoupling.

The bias-regulator layout is given in Fig. 3, and its placement in the amplifier is indicated in Fig. 4.

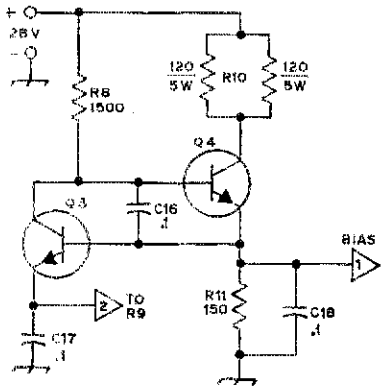
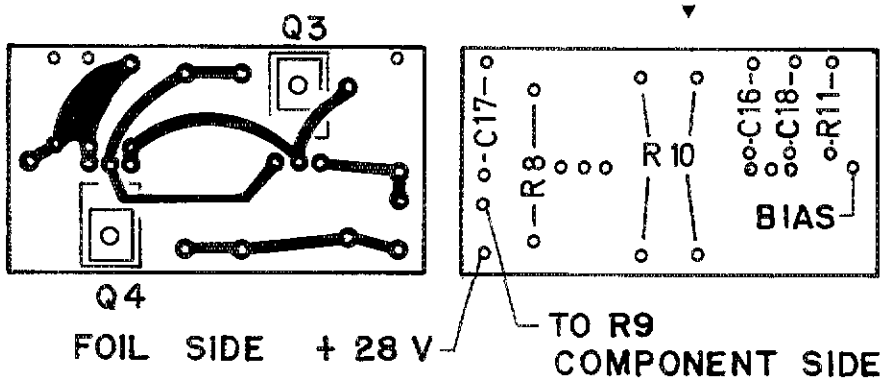


Fig. 2 — Circuit diagram and parts information for the bias regulator. The bias control, R9, is mounted on the main amplifier board. R10 can be two 120-ohm 5-watt resistors in parallel. Capacitor values in μF. Q3 and Q4 are Philips BD135 or Motorola HEP S3023.

Fig. 3 — Etching pattern, left, and parts layout, right, for the bias regulator. Half scale.



It is important that Q3 be mounted as close as possible to the amplifier transistors. Remember, there has to be an insulating disk and heat-sinking compound between the sensing plate of Q3 and the heat sink. Mechanical details of the amplifier will be given later.

Making the Transformers and Coils

The input transformer, T1, uses a toroidal core of hf material, 23 × 14 × 7 mm (approximately 7/8 × 1/2 × 1/4 inch) in size. Nearest Amidon equivalent: T-94-6. It is wound with RG-178/U coax, as shown in Fig. 5. The complete assembly is seen at the left side of the amplifier photographs. The output transformer, T3, is wound with RG-188/U coax on a toroidal core of hf material, 36 × 23 × 15 mm (1-3/8 × 7/8 × 1/2 inches). Nearest Amidon equivalent: T-130-6. Winding and connection details are given in Fig. 5. The assembly is at the right side of the photographs.

The coax used for the windings is Teflon-insulated. This is important, as much for the material's resistance to deforming when heated as for its insulating qualities. The silver-plated conductors in these types of coax are also helpful in making neat and secure assemblies. Fabrication of the transformers requires considerable care to avoid shorts, even with the recommended coax.

The small coils, L1 through L4, are closewound of enameled wire. They are barely visible in the reproduced photographs, but their positions can be seen from the layout drawing, Fig. 6. L1 and L2 are on a common vertical axis (as viewed in the photographs and layout drawing) near the top and bottom, left side, of the main parts cluster. L3 and L4 are in a common vertical plane, with their axes horizontal, to the right of the other two, and slightly nearer the horizontal centerline of the amplifier. Their dimensions are given in the parts list.

The collector coupling transformer, T2, is seen just to the right of the vertical centerline. It is wound with two conductors twisted together. The assembly is coated with cement, and baked at 150°C for 30 minutes.

Amplifier Layout and Assembly

The amplifier is built on a glass-epoxy circuit board 200 × 135 × 1.6 mm (approximately 8 × 5-3/8 × 1/16 inch), double-sided. Metal is removed from the top side only, the other surface being left as a ground plane. Drawings of the metal pattern of the finished board and the parts layout are given in Fig. 6. The two square areas near the vertical centerline are holes cut for the Philips BLX14 power transistors. These mount to the heat sink with one screw each, and a nut that fits into a hole counterbored in the heat sink. A slightly different arrangement is needed for Motorola 2N5942s. Their case is round above the mounting base, which takes two screws in line, at a 45-degree angle to the mounting centerline of the two transistors.

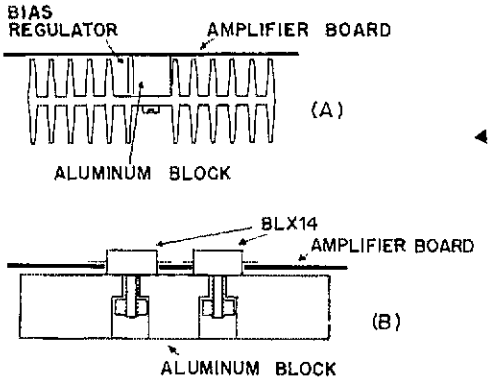


Fig. 4 — Details of the heat sink and circuit board mounting for the solid-state amplifier. One cooling fin was removed to make room for the bias regulator, as seen in drawing A. This view also shows the solid aluminum block mounted at the center of the heat sink. The power transistors on the main circuit board, and those on the bias board, are mounted so that heat from them is conducted away through the aluminum block to the main heat sink.

View B shows the mounting arrangement for Philips BLX14 transistors. View C shows the Motorola 2N5942 transistors in use. These have mounting bases requiring two holes each, in this layout arranged so that their centerline is at an angle of 45 degrees to that of the amplifier board.

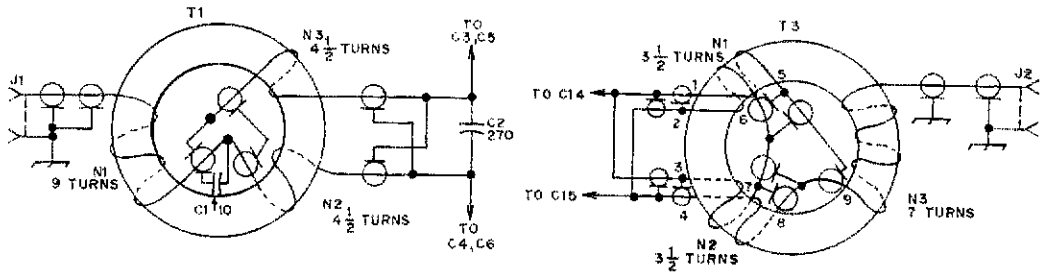


Fig. 5 — Simplified drawing of the input and output balun transformers, T1 and T3, showing method of winding and connections to the coaxial conductors. Note that windings n1 and n2 of T3 are bifilar-wound, but their conductors are cross-connected, where they go to C14 and C15. Information on the toroidal cores is given in the text.

There is a heat sink the same size as the board (Philips 56231) but this was not available, so one that was on hand was modified for the purpose. It is rather larger than necessary, and in ordinary operation with ssb the warming can barely be felt.

As seen in Fig. 4, one cooling fin was removed to make room for the bias regulator. A solid block of aluminum 30 mm square and 130 mm long (about 1.25 × 6 inches) is attached to the heat sink, centered on the transistor mounting area. The surfaces of the aluminum and the main heat sink should be as smooth and flat as possible, with no metal burrs, and all holes should be drilled exactly perpendicular to the surfaces to be joined. Apply heat-sink compound to these surfaces.

To insure mechanical strength and good contact between the transistor terminals and the board tabs, I cut eight rectangular pieces of 1-mm brass sheet, just smaller than the board tabs. These were soldered to the board, and drilled and tapped to take the BLX14 transistor tab screws. The board is held on the aluminum block with two screws at each end of the latter, and to the heat sink proper with screws at the four corners.

The toroidal transformers are fastened to the board by means of fishing line. Otherwise one runs the risk that the stiff Teflon-insulated coax used for the windings will come loose and unwind itself in the manner of a broken watch spring.

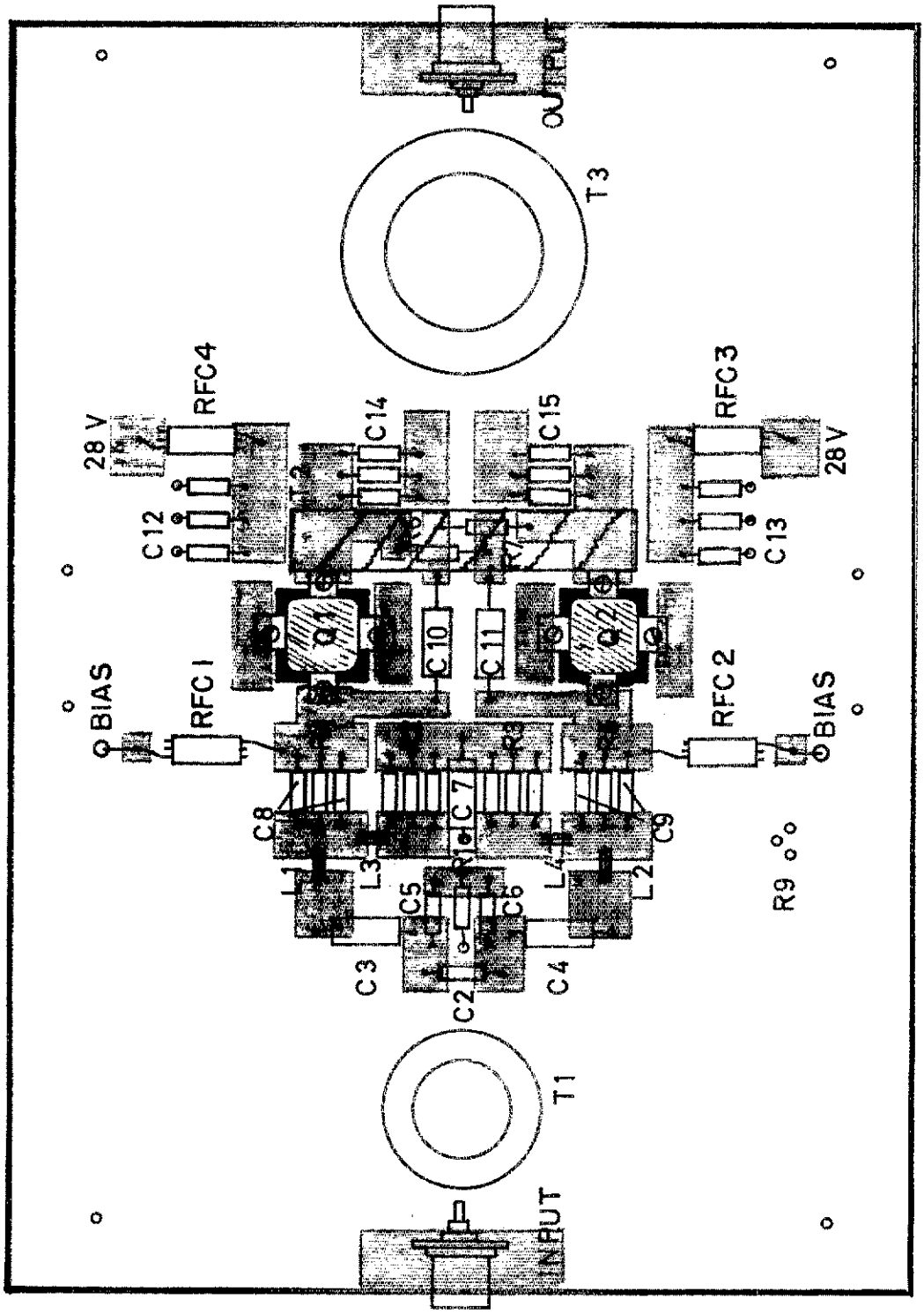
Operation

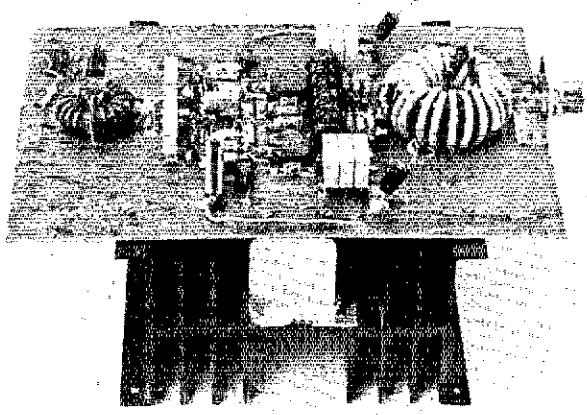
Since I use a transceiver to drive the power amplifier, switching relays are needed at the input and output. The input relay is seen at the upper left corner of the photographs, its terminals facing upward. The relays are not shown in the diagram, as they are not needed if the amplifier is driven from an exciter, rather than a transceiver.

Adjustment is quite simple. The amplifier input and output circuits are for 50-ohm lines. A 500-mA meter should be connected in the line to the 28-volt supply temporarily, and the value of R9 adjusted to give an idling current of 140 mA. A resistance of about 0.47 ohm was required. It is well to check to see that the current is divided equally, 70 mA for each transistor.

The bias regulator uses about 15 mA. Maximum amplifier current is about 6.5 amperes, being highest in 28-MHz operation. Driving power required is 2 to 3 watts. The driver should be set up to work into a 50-ohm load. Its output should be free of spurious frequencies, as this broadband

Fig. 6 — Parts layout (not to scale) for the amplifier circuit board. Some modification may be necessary if physical equivalents of the original parts are not available, but the general layout principles should be followed.





Here the amplifier is tilted to show the solid-aluminum block, center, that becomes part of the heat sink system. One fin of the heat sink (right side of the aluminum block) is removed to permit mounting the bias-regulator board directly to the block. The bias-regulator assembly is not visible in these pictures. The large toroid assembly, right, is the output transformer, T3.

amplifier will pass on unwanted frequencies as well as the desired ones.

Regulation of the 28-volt supply should be good up to 10 amperes drain. Any drop in supply voltage under normal current loads will result in distortion.

Laboratory tests made by Philips show quite uniform performance over the range 3 to 30 MHz, as to power output, efficiency, input VSWR, and third-order intermodulation distortion, with all factors off only slightly above 15 MHz or so. Motorola data presented in slightly different form show 100 watts PEP output at 4 MHz, with only 320 mW drive, whereas about 4 watts drive is needed at 30 MHz for the same output. The full range of laboratory measurements could not be duplicated in the amateur station, but efficiency and power-output checks made by the author follow data quoted by the manufacturers quite closely. QST

ATV

(Continued from page 14)

check by visual examination, or they may be susceptible to moisture deterioration, which will be found out too late if the coax is not already in bad shape from use or storage in damp conditions.

Start with the best coax you can get. Foam-insulated RG-8/U is the minimum recommended quality, and that only for short runs. Be sure that connectors are properly installed, and taped and sprayed for waterproofing if they are to be out in the weather. Use constant-impedance connectors if you can afford them, but don't worry about the objections often raised to the inexpensive "uhf" series, PL-259 and SO-239. Properly installed and waterproofed, they will do as well as the more expensive types, for all practical purposes.

Every aspect of the transmission-line performance is vital in reception, perhaps more than in transmitting. Line losses can be offset by increasing transmitter power, to a degree, but they add to the system noise figure in receiving. Once the signal is lost or degraded through transmission line defects, there is no way to get it back.

Antenna Height and Polarization

Though horizontal polarization has demonstrable advantages on somewhat lower frequencies in certain kinds of terrain, there is little to choose from between horizontal and vertical in uhf work if everyone chooses the same, so practical considerations rule. Nearly all fm communication is with vertical antennas, to simplify the antenna problem for mobile operators. Repeaters are standardized on vertical for this reason, and in Southern California ATV is following the same course.

Height above ground is important. For practical purposes, "ground" is likely to be anything up to about 30 feet above actual earth, in the average urban residential area. Get up to at least 40 feet if at all possible, as absorption and reflections are likely to be bad below this height. Going up to 60 or 70 feet is usually helpful, but much higher may not pay off, unless very good transmission line is used. Height-gain and line-loss tables are helpful in determining your needs in these respects. (These are available in the *VHF Manual.*) Absorption by heavy foliage and reflections from buildings are very troublesome in the uhf range. A large tree or a three-story house with aluminum siding may be only an annoyance to the voice communicator, but to the ATV operator either can be disastrous, in signal loss and ghost effects.

Gain and Bandwidth

High-gain antennas are desirable in ATV work, but bandwidth is more of a factor than in other forms of amateur uhf communication. A yagi array designed for maximum gain may be selective enough to restrict the bandwidth of the ATV system, so collinears are generally preferred over yagis for medium- and high-gain systems. Corner-reflector and screen-reflector arrays are also recommended. There is plenty of information in the *ARRL Antenna Book*, *Handbook* and the *VHF Manual* for the ATV operator who likes to build his own arrays. One commercially available antenna that is popular with the ATV fraternity is the Cush Craft DX-420 collinear.

Part II will appear in a subsequent issue. QST

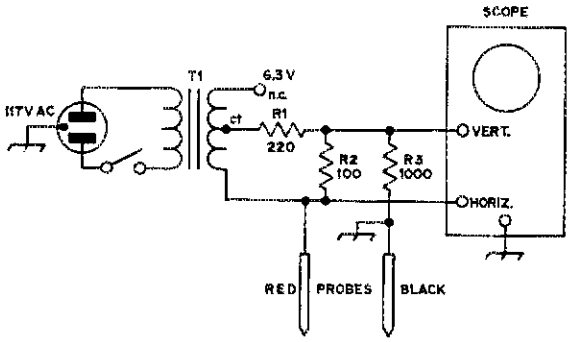


Fig. 1 — Circuit diagram of the Octopus in-circuit component testing device. T1 can be any small 6.3-volt unit. If one having no centertap is used, resistor R1 should be 560 ohms. Resistors can be 1/2-watt composition.

THE OCTOPUS

An Overall Component Tester for In-Circuit Troubleshooting

BY DAVID L. LUDLOW,* W7QHX

LOOKING FOR TROUBLE in equipment built on circuit boards usually involves removal of components, one at a time, for testing. This is a time-consuming procedure at best, and one runs the risk of damage, not only to the part being checked but to the board itself, and to adjacent components. The likelihood of making trouble for yourself increases as the size and spacing of parts decrease.

Moreover, ohmmeter testing cannot detect a shorted coil or an open capacitor, even after such parts are lifted from the board circuits. Also, some ohmmeters pass enough current at low resistances to damage solid-state components during the testing process. Obviously, some safe form of in-circuit testing is highly desirable.

The method described here is used with the equipment turned off, and uses voltages and currents low enough for safe testing of almost any transistorized circuit-board assembly. The needed tests can be made in most instances without removing the board from the equipment. The overall component tester, quickly dubbed "Octopus," is inexpensive to build and simple to use, involving only an oscilloscope as an auxiliary device.

Construction

The Octopus uses low-voltage ac, and limits currents to less than 1 mA. It energizes circuit-board components without removal of any connections, in much the same way as they are used in normal service in the equipment under test. It tests for shorts and opens, and shows forward-reverse ratios on junction components (diodes and transistors). By use of Lissajous figures and other combination displays on the oscilloscope, the Octopus facilitates analysis of circuits involving reactive components, transistors, and ICs that defy ohmmeter testing. It can show up high-resistance solder joints or test continuity of switches, fuses, lamps, or circuit-board patterns. The resistor network assures that the voltage and current will be limited to safe values.

If much work is to be done, the Octopus can be left permanently connected to a simple oscilloscope. The test prods should have small needle points, for easy access to cramped places and sure penetration of plastic and other moisture-proofing coatings. Permanent test-lead connection is also desirable, so that the setup will be ready for use at all times.

As can be seen in Fig. 1, the few parts that go into the construction of the Octopus are all commonly available items. Component values are not critical and any suitable substitute may be used. Since low voltages and currents are necessary in order to protect delicate components, the 1000-Ω resistor (R3) in series with the 1-V source voltage provided by the voltage-divider network (R1, R2) limits the current to 1 mA. A center-tapped 6.3-V filament transformer can be used for T1 and the voltage from one half of the winding is dropped to 1 V by means of R1 and R2. The leads should be color coded for easy identification with black for ground and red for the "hot" side. *Be sure that the equipment being tested is disconnected from the power source to avoid possible injury or damage.* Also, unless all circuit points in the unit (which are not being tested) are isolated from the common ground of the Octopus and scope, erroneous readings will occur in some instances.

The unit was originally designed for in-circuit testing of Navy electronics equipment. Since the power cord, oscilloscope leads and probe cables

* RFD 1 — Box 496, Oak Harbor, WA 98277.

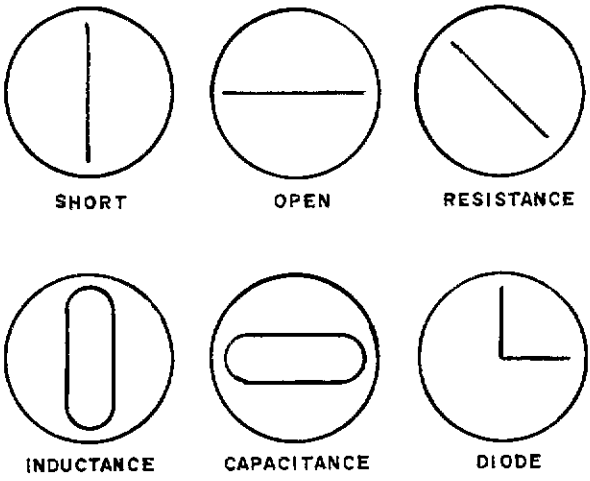


Fig. 2 — Typical oscilloscope displays for conditions most often encountered in equipment testing.

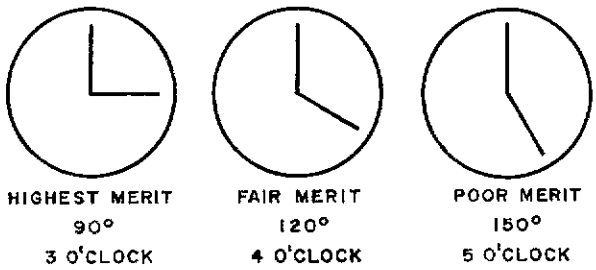


Fig. 3 — Transistor quality check, using the Octopus.

protruding from various sides of the tester resembles an octopus, it is commonly called just that.†

Operation

Each basic component projects a different scope display, making use of the Octopus a very simple matter. Connect the test leads across the component terminals or circuit points to be tested. A detachable clip for the black lead facilitates one-handed testing of many units. Because this is an ac device there is no need for lead reversal. The six most common displays are shown in Fig. 2.

When observing transistors, check from the base to emitter and base to collector. A collector-emitter test would have to pass through two junctions in series, and therefore does not usually give a meaningful result, except to indicate a possible short.

A rough check on transistor condition is evident from the patterns of Fig. 3. An ideal single-junction pattern is the 90-degree step at the left (open in the reverse direction, short in the forward direction). A wider angle than 90 degrees indicates a less-than-perfect junction, with the quality degradation indicated by increasing angle.

†[EDITOR'S NOTE: Our thanks go to David Ludlow, W7QHX, who wrote up his Octopus in a naval publication, and to David Walsh, W1FYX, who sent us the material for adaptation to *QST* use.]

Real trouble-shooting proficiency comes with the ability to sort out patterns resulting from combined components, as in the diode-capacitor circuit of Fig. 4. Here we have both a Lissajous figure and 90-degree junction step, informing us that the components are neither shorted nor open. A base-emitter transistor test, where there is inductance in parallel with the junction, would look like Fig. 4, but with the loop at a wider angle because of the resistance of the inductor, the angle being characteristic of total base-emitter resistance, as in Fig. 3. Any shorted transistor junction would show up as a vertical line, as at the upper left of Fig. 2.

To distinguish between npn and pnp transistors, move the red probe to the transistor base and the black to either emitter or collector. If the step pattern opens downward the transistor is npn (emitter arrow pointing downward in the schematic diagram). If the pattern opens upward the transistor is pnp (outward-pointing arrow). The same technique is useful for checking diode polarity, of course.

The effect of a dirty or otherwise noisy control is seen in Fig. 5. Connect one probe to the control arm and the other to either end. Move the control through its range. A quiet, smooth-working control will show a clean line. Fuzziness indicates erratic or noisy operation.

Low-value capacitors and inductors may appear as "open" or "shorted"

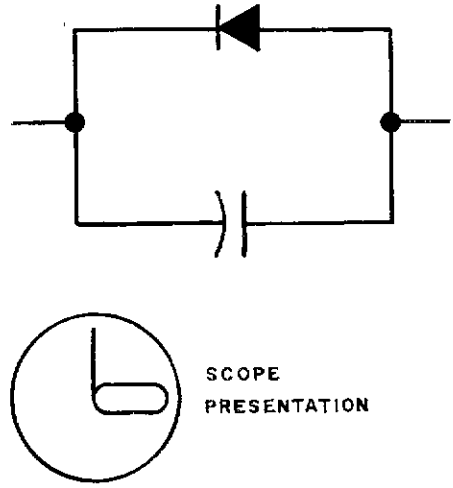


Fig. 4 — Combination pattern, showing that the diode-capacitor circuit is neither open nor shorted.

respectively. Increasing the oscilloscope gain will make it possible to check all but the lowest values, where troubles are normally least likely to occur.

Occasionally, it may appear to be necessary to remove a component from the board for testing. In such instances a comparison test with a similar complete unit known to be working properly may be helpful. This is recommended whenever it can be used, with removal of parts being done only as a last resort. Intelligent use of the Octopus will almost certainly reduce maintainance time and component damage during routine servicing procedures. Patterns obtained in specific tests can be sketched or photographed, and filed for future reference. QST

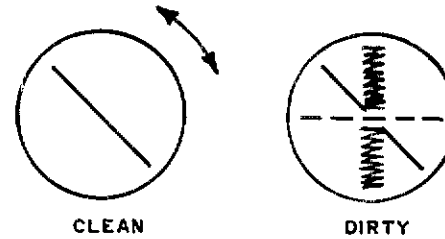


Fig. 5 — Scope pattern showing effect of a dirty or otherwise intermittent control.

50 Years Ago this month

January, 1925

. . . Construction of coils is the subject of three separate articles (by staffers Kruse, Clayton, Hatry), all seeking maximum r.f. efficiency. Spacing windings seems to be the main clue, along with methods of making them self-supporting, for minimum distributed capacity.

. . . DXing is almost commonplace now, largely at 75-100 meters. ". . . the varieties of notes, fists, languages and intermediates shout to the world that the day of true international amateur radio is here!" No acknowledgement that this is a peak sunspot year (who understood it?) although long-path QSOs seem to be recognized as such.

. . . In cooperation with *Scientific American*, the League will sponsor a nationwide fading test during the total eclipse of the sun on January 24th. Another contribution to public interest is recognized by a letter from the Navy thanking amateurs for extensive backup communications during the flight of the dirigible *Shenandoah*.

. . . "You can't work 'em if you don't hear 'em" is the apparent theme of a number of treatises on receiving — the 9ZT neutrodyne c.w. tuner, proper receiving antenna construction, measuring receiver antenna current (from an oscillating detector), unique condenser construction, and even one on the "microwaves" of 5 meters by 9APW. "The Supersink Receiver," however, turns out to be an early *QST* spoof.

. . .Hams in Modesto, California, sponsored the first Pacific Division Convention; total cost to the registrant — $1.50!

. . . Technical Editor Kruse says so long as your antenna works it makes little difference what its fundamental frequency is — but nevertheless shows how to measure it.

25 years ago

January, 1950

. . . Hams are chafing at the bit waiting official permission to use the new 21-Mc. band won (on paper) at the 1947 radio conference; we have to wait for present commercial occupants to relocate their operations elsewhere in the spectrum.

. . . W2ICE likes the gain offered by the "Lazy H" antenna design at 20 meters, and shows us how to switch phasing lines to make it bi-directional. On 2 meters, W1HDQ tackles the controversial question of vertical or horizontal polarization — with the latter getting the nod as furnishing best DX performance.

. . . A pioneer effort in public service communications was highly successful under sponsorship of the Chicagoland Mobile Radio Club, whose members used 140 units to coordinate the entire program of a six-hour Shriners parade in that city.

. . . Another first: Based on legislation introduced by state senator W4IMJ, Florida leads the way in providing call-letter license plates.

. . . This is ARRL contest season, and complete rules are given for the annual DX competition, v.h.f. sweepstakes, and 10-meter WAS affairs.

. . . Should a newcomer to ham radio choose c.w. or phone for his first activity? W2PFU attempts to clear the air by an impartial listing of the good and bad points of each.

. . . FCC has revised its controversial proposals for restructuring the amateur license system, largely in conformance with ARRL recommendations concurred in by others at the October informal engineering conference at Commission offices in Washington. Present Class A (Advanced Class) holders won't be downgraded after all, but future phone ops will have to take the Extra for use of voice bands. — *W1RW*

Strays

I would like to get in touch with . . .

. . . Other sawmill operators, K1QPN

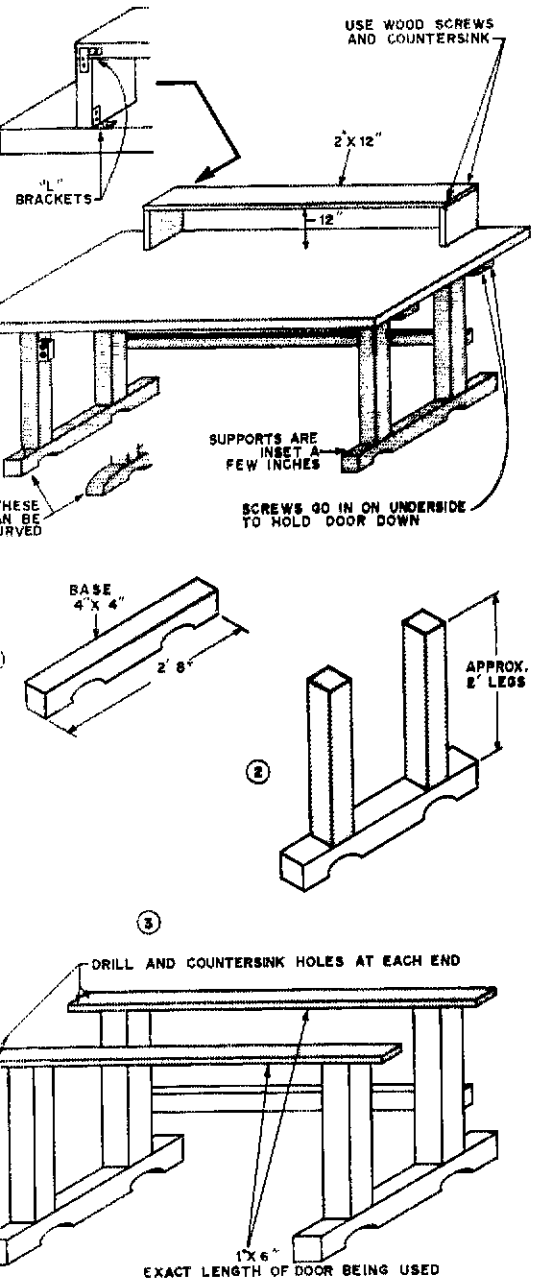
. . . Others interested in or having information on tilt-to-start mercury-vapor rectifiers. W9YLD

. . . Anyone interested in starting a "Toastmasters" net on twenty meters. WB8DLP

. . . Others who collect beer cans. WA2TEI

. . . Anyone interested in fast-scan ATV, 439.25 MHz, in southeast Florida. WA2RRG/4.

Hints and Kinks For the Experimenter



Plans for a homemade table that can be disassembled easily and is large enough to handle most of the equipment in one's shack. The builder can modify accordingly to suit his own needs.

HAM SHACK TABLE

For about $30, a handsome desk that will support heavy equipment can be built by following some simple steps. This information is offered as a guide for any amateur interested in constructing his own table (see drawing).

1) Two 4 × 4-inch, 8-foot lengths are cut into the following dimensions: four pieces 22 inches long, two pieces 33 inches long.

2) Half-moon shaped cuts are made 6-1/2 and 7-1/2 inches from each end of the 33-inch-long pieces. These cuts should be 2 inches deep. A jig saw is handy for this type of work. While not necessary, the ends of these pieces were curved to improve the appearance.

3) Place the 22-inch pieces (legs) over these half-moon cuts and mark the legs so starting holes can be made. Four 4-inch No. 14 wood screws should be sufficient to hold the legs in an upright, stationary position.

4) Next, place two 1 × 6-inch pieces over the ends of the legs and drill four starting holes at the four positions. Secure the two 1 × 6 pieces with four No. 14, 4-inch wood screws. This completes the base for the table.

5) Set a door or a sheet of plywood (1/2- or 3/4-inch thick) on top. Drill two holes through the 1 × 6 at each end, so that they enter the top. Secure to top with 1-1/2-inch No. 14 wood screws. This completes the table.

6) A 2 × 4 is placed on the back side, about half way down, to give the table lateral stability and to support electric outlets and cabling. A piece of plywood will do very nicely, too.

7) A large shelf on top gives additional room for equipment. A 2 × 12 was used here. The end supports (also made from 2 × 12 stock) for this shelf should be centered over the 4 × 4 legs of the table. L-shaped brackets hold the shelf together.

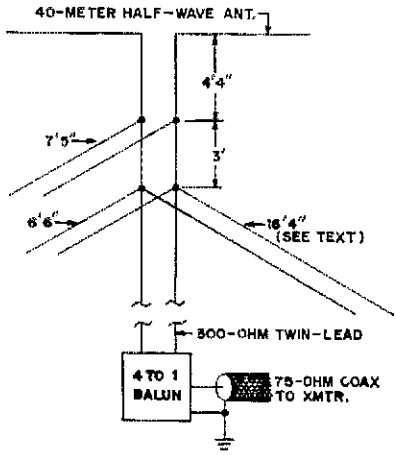
The overall dimensions used will make the surface of the table about 28-1/4 inches high, which is quite comfortable for myself. The height can be adjusted by making the legs different lengths. The table can be disassembled into its basic components, if necessary. — *Mike Greenway, K4TBN*

THREE-BAND MATCHING SYSTEM FOR A FORTY-METER DOUBLET

A common method for energizing a half-wave antenna is to feed it at the center with parallel-conductor TV lead-in, or Twin-Lead as it is usually called, and to use an open stub for matching the 50- to 70-Ω antenna resistance to the 300-Ω impedance of the line. However, this technique, as described in the latest edition of *The ARRL*

Antenna Book, generally gives proper matching on only one band.

After a number of trial-and-error calculations on a Smith Chart, along with lots of cut-and-try experimenting, I devised a three-stub matching scheme so that I could operate my 40-meter doublet on 40, 20 and 15 meters. Fig. 1 illustrates this method and gives the lengths of the stubs and their positions along the feed line. The dimensions shown are for standard Twin-Lead, with a velocity factor of 0.82. All of the stubs are open at the ends and are made from the same type of line as the feed line. Note that the two lower stubs are connected at the same point on the feed line.

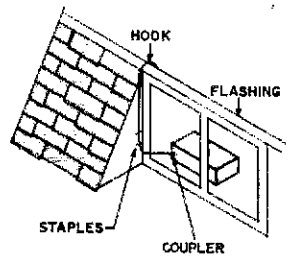


The length of the longest stub is fairly critical. It should first be cut to 17 feet and then trimmed no more than two inches at a time, until the SWR is minimum in the center or the desired portion of the 20-meter band. The feed line can then be matched with a 4:1 broad-band balun to a 75-Ω coaxial cable from the transmitter. With my antenna, the described matching system gives an SWR of less than 2.5 to 1 over all of the three bands, with minimum values of 1.3 to 1 on 40 and 15 meters, and 1.7 to 1 on 20 meters. As with any multiband antenna, one must guard against harmonic radiation. – *Frank Stuart, K7UUC*

APARTMENT DWELLER'S ANTENNA

After trying several different indoor antenna configurations in my apartment with only mediocre results, I thought of using the metal flashing around the roof as an antenna. I simply formed a hook out of 1/16-inch model airplane "music wire" and hooked it over the edge of the roof. A flexible wire was attached to the music wire and brought into the shack to a conventional *L*-network coupler. The system performs remarkably well on all bands (80 through 10 meters); over 100 countries have been worked with it in less than eight months. In addition, it is quite inconspicuous. The antenna seems to exhibit directional properties favoring the longest dimension of the building, but is effective in all directions.

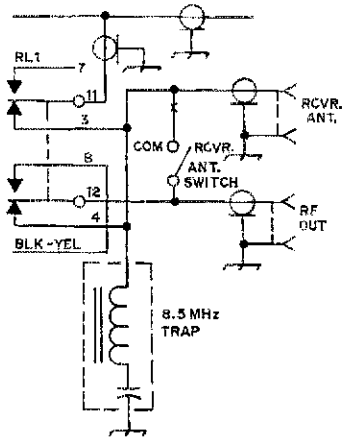
The only difficulty experienced so far has been corrosion of the music wire leading to poor contact with the metal flashing. This problem has been



solved by soldering a piece of tinned copper wire (which appears to corrode more slowly than the iron wire) to the music wire and then wrapping it around the hook. – *Ira Lipton, WA2OAX*

THE SB-101 AND A SEPARATE RECEIVER

The wiring of the receive antenna jack of the SB-101 can be modified to accommodate an auxiliary receiver. This is done by bending contact 4 at the socket of relay 1 and soldering it to contact 3. To prevent rf from reaching the front end of the outboard receiver when the antenna switch is in the COMMON position, disconnect one side of the switch AK. Now the auxiliary receiver has the same antenna as the transceiver and can be used for separate receive and transmit operation. – *Timothy J. Brown, WB2ARG/6*

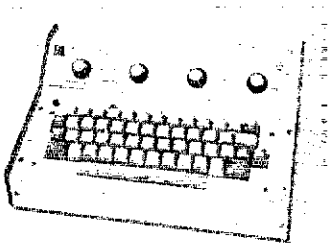


SOURCE FOR INSULATORS

One item that is almost impossible to find, but is a necessary component for amateur work, is the common insulator. Feedthrough, standoff, and antenna insulators just don't seem to exist anymore. One answer to the problem is to use sheet polystyrene. Nearly any plastic dealer or hobby shop stocks sheet poly, and the material can be cut and drilled to form almost any type of insulator. Polystyrene will handle any rf or dc voltage an amateur is likely to encounter and the material is extremely low loss. – *W1ICP*

Recent Equipment

To acquaint you with the technical features of current amateur gear.



The *HAL* Communications DKB-2010 Dual-Mode Keyboard

A RATHER OBVIOUS prerequisite for the full enjoyment of RTTY operation is the ability to type effectively. However, even experienced touch typists often run afoul in their first encounters with conventional teleprinter keyboards. (This is perhaps truer of earlier mechanical models, but newer electric types are often difficult to obtain by amateurs.) Many mechanical and electric keyboards require a well defined rhythm in order to avoid pressing the next character key while the previous one is depressed. Otherwise, only the first character will be sent. When sending a number, a special key has to be depressed ahead of a numeral key (equivalent to a carriage shift in ordinary typing) and a similar process repeated when returning to a letter-character format.

Needless to say, only the stout-hearted have the perseverance to learn fundamental typing skill and master the peculiarities of teleprinter keyboards at the same time. The HAL Communications DKB-2010 Dual-Mode Keyboard eliminates much of the frustration of the latter problem. Operation is very similar to an ordinary electric typewriter since the more cumbersome functions associated with teleprinter keyboards are accomplished automatically by the machine. Numbers can be typed directly because the proper figure-shift signal is sent whenever a numeral key is depressed. When the next letter-character key is depressed, the machine sends a letter-shift signal first. No special rhythm is required since one or more keys can be down simultaneously without impairing operation. If another key is depressed, the letter will be typed correctly.

Other features of the RTTY mode are standard speed options of 60, 66, 75, and 100 wpm. Also, 132 wpm can be obtained on special order. Speeds can be selected by means of a switch on the keyboard panel. When the end of a line is reached (approximately 64 characters and spaces) a tone beep is heard and a continuous light tells the operator to send a carriage-return and line-feed signal. Also included are an identifier and test-message generator. The identifier can be pre-programmed with the station call (up to 12 characters).

The Extended Memory Option

HAL also offers an extended memory option for the DKB-2010. Two models are offered which extend the memory from the three keystrokes in the basic keyboard to either 64 or 128 keystrokes. Consequently, if one's typing ability is greater than the sending speed being used, it is possible to type ahead by as much as two lines with the 128-keystroke model. However, the operator has to know when to punch a line-feed and carriage-return since the line counter only indicates when a line is sent and does not include the characters still in the memory. Determining the point to start a new line is not such a problem when copying from a text, but is harder when no reference point is available. This would occur during an ordinary QSO where the operator was typing from memory, but only the more proficient operators would be able to get ahead so far that finding the spot to start a new line would cause difficulties. It is also possible to store characters in the memory and then run them off at a later time. Here again, a problem of where to start a new line occurs with the 128-keystroke model but not with the 64-keystroke one. HAL informs us that a modification is available which causes the warning light to come on at half brilliance when 64 characters have been sent. With some early keyboards, the audio output from the monitor speaker is somewhat low: a modification is available to improve this condition. Anyone who is interested in these modifications is asked to get in touch with the factory.

Installing the extended memory option in the DKB-2010 is a relatively simple process. The memory consists of a single printed-circuit board and an adapter which plugs into the main circuit board used for the key contacts. (See Fig. 1.) No difficulties were encountered when the writer installed the modification.

Other Features

Both manuals for the main keyboard and the extended memory option are well written and contain complete schematic diagrams and explanations of the various circuits incorporated into each unit. The keyboard is compatible with other HAL products. (See Recent Equipment in *QST* for April, 1973.) It is also compatible with other terminal units and teleprinters commonly available. Loop connections provide options for use with either positive- or negative-grounded loop power supplies. Loop currents up to 80 mA can be used and the maximum voltage permitted across the loop connection of the keyboard is 250. – *W1YNC*

"Morse" Operation

The international cw code we all use isn't exactly Sam Morse's code, but the term seems to have been generally adopted by industry, government, and the fraternity, so we'll refer to it as Morse. In Morse operation, then, the DKB-2010 keyer has all the operating features that the average cw man could desire and, with the built-in extended memory option, all the features most *anybody* could desire. It has an easy touch similar to modern electric typewriters, a standard keyboard with some extra character availabilities useful to amateur operators, a sidetone monitor so you can listen to your keying if desired, speed control from less than 10 to over 60 wpm, weight control to suit your taste, and an "auxiliary" key which can be constructed to trigger any special output you select. Without the extended memory option, it contains a 3-character memory and space bar so that you can type ahead of what is actually coming out and thus assure perfect spacing. With the extended memory option it can store 64 or 128 keystrokes, depending on which option model you select, and these can either be stored and released at will, or stored in advance while being sent. The "EMO" can be installed at purchase or later by the purchaser if desired.

Operating the board takes a little getting used to, just like operating any new typewriter. Unlike a typewriter, however, it is perfectly quiet, except for the sidetone, which can be turned off, and the tapping of the fingers on the keys. When first turned on, the identifier circuits of the keyer may be in operation, so you should activate the keyer *off* the air.

When the keyer clears itself (ten seconds or less) you are ready to go. This operator found that the best keying method was to type each word or group ahead of the output, then wait for the output to catch up before going on to the next word or group. Care must be exercised to avoid getting more than three characters ahead, since without the built-in EMO the unit has only a three-character memory. Since this operator's typing is not very steady, it seemed easier simply to allow a space at the end of each word before going on to the next. However, this is a personal preference, and the space bar may be used to insure that at least normal spacing occurs between words. With the EMO, of course, it's a slightly different ball game, because with this you can type as far ahead as you please (practically speaking), using the space bar normally, and the code will flow perfectly from the keyer output. ("Perfectly" includes reproducing your typing errors perfectly, too!) There is no indicator to tell you how much is stored in the memory, but a red light indicates when the buffer is full.

With the EMO installed, a few extra functions have to be performed to operate the buffer. These are simply a matter of pressing proper key combinations, and quickly become second nature for such operations as clearing the buffer, stopping the flow of characters, and releasing stored characters to the output.

The output of the keyer will handle either grid-block or cathode keying. Voltage and current capacities on both are sufficient to handle those normally present in such circuits, with quite a bit of leeway. – *W1NJM*

The HAL Communications DKB-2010 Dual-Mode Keyboard

Dimensions (HWD) and Weight: 5-3/4 × 13-1/4 × 9-1/2 inches, 8 pounds.
Power requirements: 117 V ac.
Price class: Basic keyboard, $425 assembled and $325 in kit form. Extended memory option, $100 for 64-key model and $150 for 128-key model.
Manufacturer: HAL Communications Corp., Box 365, Urbana, IL 61801.

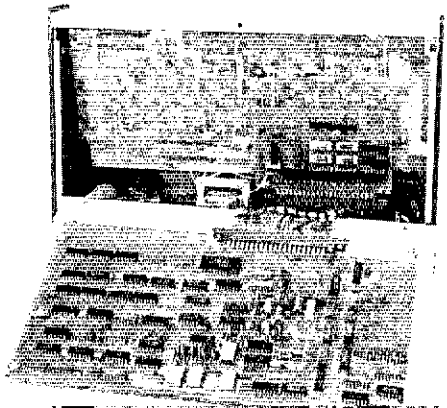
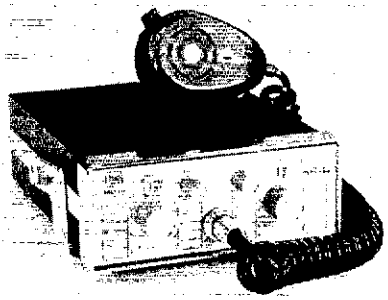


Fig. 1 — Interior view of the DKB-2010. Note the extended-memory option circuit board atop the edge-pin connector.

Regency

HR-6

FM Transceiver



AMIDST all the hubbub and ballyhoo about repeaters, especially those operating in the two-meter band, there is a band that seems to have been forgotten. It is a band with space for repeaters and simplex operation, with other modes thrown in, and possessive of some distinctive propagation characteristics. The band is six meters – 52 to 54 MHz available for repeater operation.

The Regency HR-6 FM transceiver is offered as evidence that the band is not forgotten. With twelve-channel capability, the transceiver should provide enough flexibility to cover most of the repeaters that are, or will be, available in the band. The independent switching of receiver and transmitter frequencies adds considerably to the flexibility, permitting use of combinations that are not tied to strictly "input-output" pairs, as is the case where one switch does it all.

Circuitry

One might wonder what can be found to talk about concerning the circuitry of a six-meter fm rig. In fact, those thoughts were very much with this writer when looking over the instruction manual that came with the equipment. After all, haven't we seen it all before, on the way up to other vhf and uhf bands? What do we need – an oscillator, modulator, frequency multipliers – but wait a moment, what is that IC doing in the middle of the oscillator circuit?

Since the device is not identified as to type or function, it took a bit of sleuthing and comparing of pin numbers to find out what the Regency people were up to. The IC is a frequency divider – by two in this case. Clever! Starting with a crystal at 8^+ MHz, the energy presented to the phase modulator (two Varactor diodes) is at 4^+ MHz, thus enabling the generation of a useful index of modulation before the distortion becomes unbearable. Why not start at 4 MHz in the first place? A glance at the space occupied by twelve HC25/U-style crystal holders, and a quick comparison with the space needed for HC6/U holders makes the answer to that quite obvious. It may be possible to put a 4-MHz crystal into an HC25/U holder, but it certainly cannot be easy – or inexpensive.

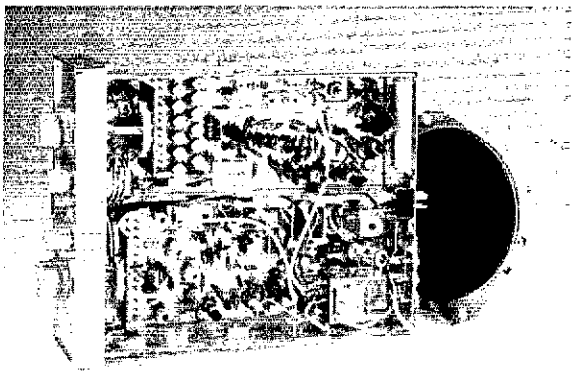
Other than the feature just described, the circuitry in both the transmitter and receiver follows conventional lines. The transmitter output has an SWR detector, coupled to a dc amplifier that reduces drive to protect the output stage. This is quite useful for six-meter mobile installations since the antennas are larger, therefore more prone to hitting obstructions.

The receiver is of the double-conversion type, with a ceramic filter at the input to the low i-f stage. These filters are available in a variety of bandwidths, so anyone ordering an HR-6 might do well to make sure that the filter is compatible with the fm in use locally. Six meters is one band where there is still varied (and sometimes vocal) opinion as to whether to use wide (±15 kHz) deviation or narrow (±5 kHz). The detector in the receiver is of the popular "quadrature" type, wherein one IC performs the function of several discrete components.

Operation

No problems were experienced in mounting the transceiver in the car, which is to be expected with a box the size of two ARRL *Handbooks*. Since the four-pin connector and cable assembly was still in the vehicle from a previous Regency installation, that part was easy (three cheers for standardization).

The antenna presented a small problem, since the writer was loathe to drill holes in the family



The transceiver compartment is separated into two portions by a shield in the middle, between the receiver and transmitter boards. The receiver is in the bottom half. A heavy copper plate on the upper right wall helps conduct heat from the PA transistor to the side of the case.

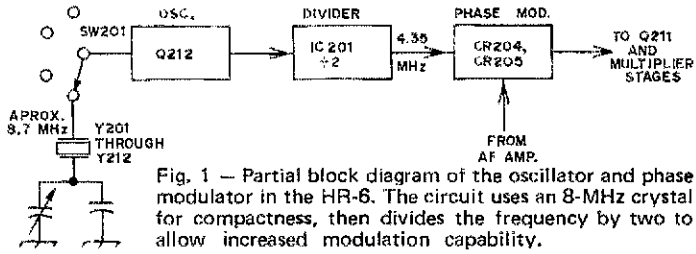


Fig. 1 — Partial block diagram of the oscillator and phase modulator in the HR-6. The circuit uses an 8-MHz crystal for compactness, then divides the frequency by two to allow increased modulation capability.

transport, and it was nearing time of departure on a trip that was to be made more enjoyable because the rig was along. A jury-rigged gutter clip and base-loaded whip filled the need, and allowed the transceiver to provide excellent communications throughout an 800-mile journey. Admittedly there were instances when copy could have been improved by the use of a "full size" quarter-wave whip, but the equipment performed very well. The internally mounted speaker provided ample audio for mobile listening.

Since there exists some difference in opinion about the deviation levels that are best on the 6-meter band, a compromise was reached in adjusting the unit before the trip just mentioned. A setting of ±10 kHz worked out just fine – in areas where ±5 kHz deviation was the thing, just backing away from the mic a bit kept everyone happy. In ±15-kHz areas, all that was necessary was to "crowd" the mic or speak up. There were plenty of advisors to let me know if I forgot which area I was in!

At the home station, connecting the rig to a ground-plane antenna provided many contacts. In addition to good local coverage, some interesting band openings were noticed, including many to the midwest and some Chicago-area repeaters. The simplex frequency (52.525) was used by many operators during the June, 1974, vhf contest. It was very interesting to follow the signals from various hilltoppers and mobile operators as band conditions changed. An opening to a different section of the country or the appearance of a new call was always greeted by bedlam as the hilltop group sought to add more points to their score. The 25-watt output from the HR-6 could not "bulldoze" through the capture of the big rigs, but with the aid of patience and good operating acumen, the transceiver garnered a goodly share of the contacts available. – *WISL*

Regency HR-6 Six-Meter FM Transceiver

Dimensions (HWD) and Weight: 2-5/8 × 6-1/2 × 8-1/2 inches, 4 pounds.

Power requirements: 13.8 V dc nominal, 11.5 to 14.5 usable. 400 mA receive, 5 A transmit.*

Channel capability: Twelve, receiver and transmitter frequencies independently selectable. Unit is supplied with 52.525 MHz installed.

Receive crystal frequency: Approx. 42 MHz (channel frequency minus 10.7 MHz).

Transmit crystal frequency: Approx. 8.7 MHz (channel frequency divided by 6).

Power output: 28 watts at 13.8 supply voltage.*

Receiver sensitivity: 0.32 μV for 20 dB quieting, 0.19 μV to open squelch.*

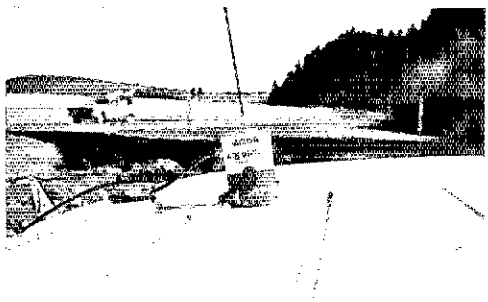
Modulation capability: Adjustable to ±15 kHz.

Receiver modulation acceptance: ±15 kHz, kits available to reduce bandwidth for modulation acceptance of ±8 kHz.

Price class: $240.

Manufacturer: Regency Electronics, Inc., 7707 Records St., Indianapolis, IN 46226.

* Measured in the ARRL lab.



Strays

K7BOQ has discovered how to get more soup into his antenna.

QST for

OSCAR NEWS

Shown visiting the G3IOR shack is (right) Gary, CN8BO, whose tireless efforts as a control station for Oscar 6 have greatly increased the satellite's usefulness to European amateurs and probably have been important in keeping the satellite alive. Pat, G3IOR, is co-editor with G3WPO of an "Oscar News" bulletin which is a major source in Europe of information on the satellite program. *(Photo by Gary's wife Cathy, WA7VQJ)*

OSCAR 7 – IT WORKS!

Amateur radio's seventh satellite left the launch pad at NASA's Western Test Range on November 15, 1974, 1711 GMT, and ushered in a new era in amateur radio communication. For the first time we have *two* active, functioning satellites in orbit, available for use. Oscar 7 was pronounced normal ("nominal," in space-age parlance) shortly after launch and as of this writing has been performing more-or-less as expected for about 200 orbits.

The two-to-ten meter translator on board Oscar 7 has proven to be not quite as sensitive as the one in Oscar 6, though the ten-meter beacon is much stronger and the downlink signal in general is quite robust. It appears that the recommended power level for this translator will be somewhat higher than the 100-watt effective radiated power maximum requested of Oscar 6 users. On the other hand, the 432-MHz-to-two-meter translator is working quite a bit better than expected, with power levels on the order of 80 to 100 watts erp providing a usable return signal. Understandably, there is some problem with high-power stations overloading the translator; the power level necessary to access this part of the satellite package had been expected to be much higher. As users gain experience with the translator, this problem should diminish. The unexpected sensitivity of the 432 MHz receiver aboard Oscar 7 means that a varactor tripler providing 10 watts or so to a moderate-gain antenna is a practical way to gain access to the satellite.

Some early examples of QSOs through the 432-MHz-to-two-meter translator include PAØSSB (The Netherlands) to VE2BYG (Quebec) and WØPHD (Minnesota), and JA1KCA (Japan) to K7BBO (Washington). K7BBO was heard in Europe by DK1KO. (Tnx *VERON VHF Bulletin.*) – *K1ZND*

Direction Quad *(Continued from page 23)*

weight does not include the mast for the 40- and 80-meter antennas.

Standard handbook formulas were used to determine the element lengths (driven element, 1005/f (MHz) and 1030/f (MHz) for the reflector).[2] I used No. 14 wire for the elements and fed the array with 50-ohm coaxial cable.

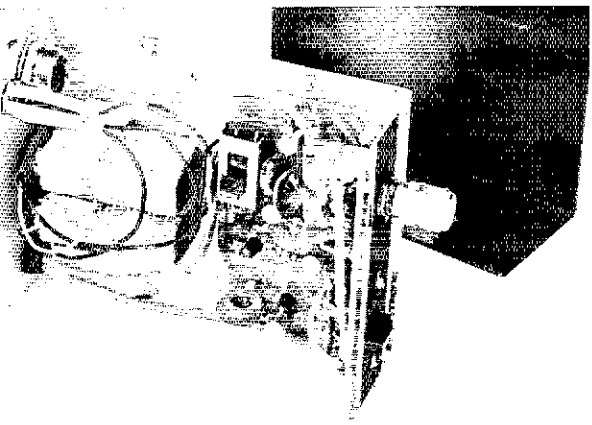
Many checks were made on the antenna and it was determined that at resonance, the SWR was 1.4 to 1. From 14.050 to 14.340 MHz the SWR did not exceed 2.5 to 1. If desired, a quarter-wave matching section of 70-ohm coaxial line could be used to improve the match at resonance, which would increase the bandwidth of the antenna. However, even at the band edges I had no tuning or loading problems.

While I didn't do it, adding 15- and 10-meter elements shouldn't present any problems (see Fig. 2). Forming a cross with nylon rope and using the rope to support the elements should enable one to add the other two bands.

Performance was as expected with about 6-dB gain as compared to my dipole. The beam also showed a front-to-back ratio that was apparently 20 to 30 dB. I was able to copy signals out of Europe which were completely unreadable with a dipole. Aimed at Europe from my QTH, the antenna does a good job covering all European countries.

The antenna is no more noticeable than the guying that is used to hold up the mast. I had the mast up for over two years and used it to support the 80- and 40-meter dipoles which also serve as mast guys. The final test came when I asked my neighbor what he thought of my new quad antenna. His answer, which couldn't have pleased me more, was, "What new antenna?" QST

[2] **[EDITOR'S NOTE: To save the reader from figuring it out, formula lengths for 14.2 MHz are 70 feet, 8 inches for the driven element and 72 feet, 6 inches for the reflector. For 14.05 MHz, the driven element is 71 feet, 6 inches and the reflector is 73 feet, 4 inches.]**



THE MATRIC MODEL 60 SPEECH PROCESSOR

The Model 60 is a speech processor of the af-compression type. Two germanium diodes are used to limit the audio voltage during voice peaks. An *RC* low-pass filter follows the limiter circuit and helps prevent unwanted harmonics from entering the speech amplifier of the transmitter. Power for the processor is supplied by two 9-V batteries. The only leads required are connections for the mic and those from the processor to the transmitter mic input and PTT circuitry.

There is a gain control for setting the compression level and a switch to select either the compression or normal mode of operation. An internal control permits establishing the best output level for the transmitter speech amplifier. Another switch inside the processor is provided for selecting either a high- or low-impedance mic input.

Using the Processor

Unless a processor such as the Model 60 is applied properly, the result is apt to be a medley of flaring tempers, OO reports, damaged equipment, and other unwanted tunes from the days of Rotten Radio. Speech processing represents a complex interaction between voice characteristics, both af and rf filtering, alc action, and power-handling capability. The objective of processing is to improve intelligibility under weak-signal or noisy-channel conditions and *not* to increase the average-to-peak power ratio. Unfortunately, many use the latter as a criterion in adjusting a processor. No worse method could be found! For instance, a square wave has an average-to-peak power ratio of 1, but if it were used to modulate a perfectly linear ssb transmitter an infinite spike in PEP would occur! The various filter bandwidths in an ssb transmitter prevent this from happening in practice. Unlike other forms of modulation the PEP of an ssb signal is not only proportional to the amplitude of the individual tones that make up the modulating waveform, but to the number of components as well. As the compression or clipping levels are increased, so are the intermodulation distortion products, harmonics, and background noise. Eventually, it will be these components that add to the average power, and in some cases to the PEP also.

Because of the latter consideration it is important to follow a systematic approach in adjusting a processor. First, connections to and from the processor should be checked to be sure they comply with good rf-feedback-prevention practices. Initial tests with the processor should be performed with the transmitter connected to a dummy load. Spurious signal levels should be monitored in a nearby receiver to see that no increase occurs as the compression control is advanced. This can be accomplished by listening to the signal at frequencies adjacent to the transmitter filter pass band. On-the-air tests can then be performed and the foregoing checks repeated with another station. The maximum level that can be used safely has to be determined by experiment, but it is seldom necessary to use this level of compression.

On-the-Air Results

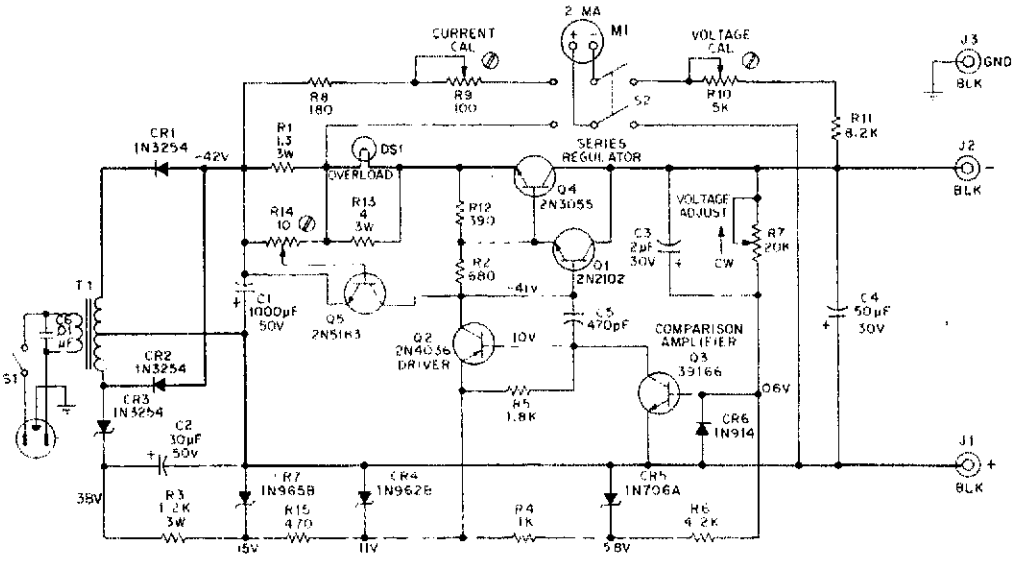
The writer followed the foregoing procedure in the initial adjustment of the Model 60 Speech Processor and the results were quite gratifying. Readability under severe band conditions showed a marked improvement when the processor was used. There were no reports of splatter, and the audio quality was good. Transmitter operation was normal in all respects. No symptoms of rf feedback were observed. Power level under most tests was in the order of 180 watts. Generally speaking, the Model 60 Speech Processor could be recommended for any transmitter that doesn't have provisions for internal speech processing. The price class is $30. This processor is available from Matric, Box 185A, Franklin, PA 16323. – *W1YNC*

RCA WP-703A POWER SUPPLY

One of the workshop items required by amateurs who design and build solid-state equipment is a variable-output dc power supply. Though this is basically a truism, some amateurs have been known to impose a handicap upon themselves by trying to work with batteries during home workshop exercises. The RCA WP-703A is small enough in size to be transported easily from workbench to operating position, or vice versa, and will not occupy an excessive amount of space. It can be used to provide well-filtered dc output from a fraction of a volt to as much as 20 volts. The output is regulated in that range at 500 milliamperes maximum.

Separate terminals are available for the positive and minus buses of the dc output, thereby making it possible to use the WP-703A with equipment of either polarity. A third binding post is available for grounding either the positive or negative dc output terminals to the chassis of the power supply. This feature helps reduce unwanted hum which could result from ac ground loops.

Overload current is limited to prevent damage to the power supply. Even a direct short across the



NOTES
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/2W 5%
2. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
3. HEAVY LINES INDICATE MAIN CURRENT PATH
4. VOLTAGES MEASURED UNDER NO LOAD CONDITIONS, CONNECT GROUND LEAD OF VOLTMETER TO J1, THE RED DC JACK. VOLTAGES MAY VARY ±20% INPUT VOLTAGE 120VAC 60HZ

Fig. 1 — WP-703A schematic diagram.

output terminals will not cause damage to the WP-703A. A panel lamp glows when the current rating of the unit is exceeded. The greater the overload condition, the more the lamp is illuminated.

The power supply is (HWD) 3-1/4 × 8-1/4 × 5-1/4 inches and weighs 3 pounds, 13 ounces. It requires 110 to 135 V ac, 50-60 Hz. The price of the unit is $60.00. It is manufactured by RCA Electronic Components, Harrison, NJ 07029.

Those wishing to have a similar power supply, but one capable of delivering 0 to 40 volts dc at 250 milliamperes (maximum) can purchase the WP 704A. A schematic diagram of the WP-703A is included in this review for those interested in learning the circuit details.

Several months of daily use provided reliable, trouble-free operation from the WP-703A in the ARRL laboratory. The equipment has been a useful addition to the test-equipment collection on the reviewer's bench. — *WICER*

Strays

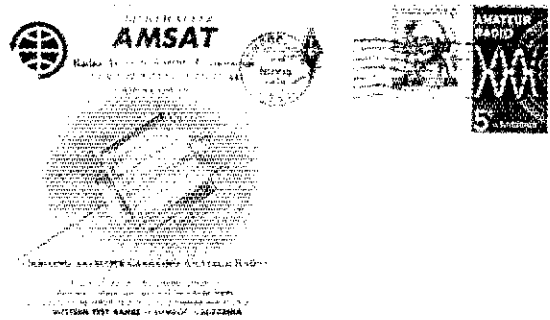
Here's a rare one! ZL3JC qualified for WAS No. 24,558 on September 9, 1974 with all cards representing 21 MHz Novices. Wonder who the first one will be to make it on 10!

— • • • —

Some years ago when I was at the Tropical Radio Telegraph Company's plant near Managua, it was interesting to note how the migratory birds checked out the voltage pattern on our antennas. We had a number of Y-matched doublets fed with 600 ohm lines. During the season it was noted that the birds would perch only between the Y-feed points and beyond the end insulators on the support cables. Maybe up in the cold northland they would perch only between the feed points and the end insulators to warm their feet up. — *K4ZZV*

AMSAT-OSCAR 7 FIRST DAY COVERS AVAILABLE

Official first-day cover envelopes commemorating the launch of Oscar 7 are now available from Amsat for $1.00 each, plus a self-addressed, stamped envelope. Five IRCs (plus an additional IRC in lieu of postage) also will be accepted. The first-day cover envelopes were postmarked at the launch site, Lompoc, California, on the day of the launch. Write Amsat, P. O. Box 27, Washington, DC 20044.



ARRL QSL Bureau

The function of the ARRL QSL Bureau is to facilitate delivery to amateurs in the United States, its possessions and Canada, of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped, self-addressed envelope, about 5 by 8 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

Cards for stations in the United States and Canada should be sent to the proper call area bureau listed below. Recent changes are in **bold face**.

W1, K1, WA1, WN1 – Hampden County Radio Association, Box 216, Forest Park Station, Springfield MA 01108.
W2, K2, WA2, WB2, WN2[1] – North Jersey DX Assn. PO Box 8160, Haledon, NJ 07508.
W3, K3, WA3, WN3[1] – Jesse Bieberman, W3KT, RD 1, Box 66, Valley Hill Rd., Malvern, PA 19355.
W4, K4 – National Capitol DX Assn., Box DX, Boyce, VA 22620
WA4, WB4, WN4 – J.R. Baker, W4LR, P.O. Box 1989, Melbourne, FL 32901.
W5, K5, WA5, WB5, WN5[1] – ARRL W5 QSL Bureau, Box 1090, Sherman, TX 75090.
W6, K6, WA6, WB6, WN6 – **ARRL W6 QSL Bureau**, 2814 Empire Avenue, Burbank, CA 91504.
W7, K7, WA7, WN7 – Willamette Valley DX Club, Inc., PO Box 555, Portland, OR 97207.
W8, K8, WA8, WB8, WN8 – Columbus Amateur Radio Assn., Radio Room, 280 E. Broad St., Columbus, OH 43215.
W9, K9, WA9, WB9, WN9 – Northern Illinois DX Assn., Box 519, Elmhurst, IL 60126.
WØ, KØ, WAØ, WBØ, WNØ – Dr. Phillip D. Rowley, KØZFL, 5209 Loma Linda Road, Alamosa, CO 81101.
KP4, WP4[1] – Robert C. Lum, KP4DNV, P.O. Box 1061, San Juan, PR 00902.
KV4 – Graciano Belardo, KV4CF, P.O. Box 572, Christiansted, St. Croix, VI 00820.
KZ5 – Lee DuPre, KZ5OD, Box 407, Balboa, C.Z.
KH6, WH6[1] – John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, HI 96701.
KL7, WL7 – Alaska QSL Bureau, Star Route, Box 65, Wasilla, AK 99687.
VE1 – L.I. Fader, VE1FQ, P.O. Box 663, Halifax, NS.
VE2 – A.G. Daemen, VE2IF, 2960 Douglas Avenue, Montreal, Quebec, H3R 2E3.
VE3 – R.H. Buckley, VE3UW, 20 Almont Road, Downsview, ON.
VE4 – D.E. McVittie, VE4OX, 647 Academy Road, Winnipeg MB R3N ØE8.
VE5 – A. Lloyd Jones, VE5JI, 2328 Grant Road, Regina, SK, S4S 5E3.
VE6 – D.C. Davidson, VE6TK, 1108 Trafford Dr. N.W., Calgary 47, AB.
VE7 – H.R. Hough, VE7HR, 1291 McKenzie Rd., Victoria, BC. V8P 2L8.
VE8 – Frank Van Der Zande, VE8OO, P.O. Box 72, Fort Smith, NWT XØE ØPØ.
VO1 – William Coffen, VO1KM, P.O. Box 6, St. John's NF.
VO2[1] – Stan L. Parsons, VO2AS, P.O. Box 232, Goose Bay, LB.
SWL – Leroy Waite, 39 Hannum St., Ballston Spa, NY 12020.

[1] These bureaus prefer 4-1/4 by 9 1/2 inch or No. 10 business envelopes.

QSL Bureaus for other U.S. Possessions and for other countries appear in the "IARU NEWS" section of the June and December issues of *QST*.

Keyer/TR Switch *(Continued from page 20)*

The design of the keyer assures that it is entirely free of locking up under any keying situation. However, when ac power is turned on, with some ICs it is necessary to send a couple of dashes first to synchronize the circuit. If this is necessary in your case, you can eliminate this minor annoyance by trying a 1000-Ω resistor between ground and Q or $\bar{Q}$ of U3A. Once the right combination is found, the circuit will automatically synchronize itself thereafter.

Parts

Diodes CR1-CR4 are all silicon computer switching diodes. I used the pack of ten 1N914s available at Radio Shack. These should be checked with a battery and a voltmeter, as they come untested. Transistor Q1 is a garden-variety audio or switching npn silicon type – almost anything will do. Transistor Q2 must carry about 450 mA on current surges, so use a power type rated at an ampere or more. However, no heat sinking is necessary, since saturated switching generates little heat.

If you build the T-R switch only, and key it from a low-current external switch (such as a transistor output keyer), Q2 should have a minimum beta of 30 when used with the 390-Ω base resistor mentioned before; the 2N6109 will work fine, or use the RS 276-2026 instead of the RS 276-2025 listed. If you want to try out transistors you have on hand, the criterion for proper operation of Q1 and Q2 is that the voltage between the collector and the emitter should be 0.25 volt or less (typically 0.1 volt) when the T-R switch is keyed. To properly simulate the keyed condition, temporarily short the clear input of U2A (pin 2) to ground.

When shopping for relay K1, be sure to get the spdt variety, as the spst type has also been seen parading under this same part number at Radio Shack. If you order the substitutes listed from Poly Paks, be sure to adjust the number of turns so that the relays close at the current specified on the schematic.

The only items not available from Radio Shack are the LM309H voltage regulator, available from Poly Paks, and the 47-Ω 2-W resistors, available at any radio-TV parts store.

Acknowledgments

Thanks to my brother Mike (ex-WA9NEF), and to Mark, WB2JID/6, for reviewing the preliminary manuscript; also to Ed, W5HW, for on-the-air tests of the T-R switch. QST

FEEDBACK

From Bert Kelley, K4EEU, comes word of a few errors in his "Digital Clock" article, page 14, November, 1974 *QST*. In Fig. 1, pin 11 of U4 should connect *only* to pin 2 of U5. Mention of C1 was omitted from the text; it sets the timing of the multiplexing frequency and the value is not critical (those who notice any flickering of the display may want to change the value). On page 18, in the parts discussion, the text is transposed. It should read "Q2 through Q8 should be npn silicon like 2N2222. Q1, Q9 through Q14 should be pnp similar to 2N2907." Also, the jumper for 50/60 Hz selection should be installed for 60 Hz, as shown correctly in Fig. 2, page 17.

We have also received correspondence from K3DE, and others, indicating that the unused gate inputs on the CMOS CD4001 (U1) should be connected to either a + or a – voltage supply. This is to prevent excess current flow that can be caused by high-impedance "floating" gates. It can be done by connecting pins 1 and 2 (of U1) to pin 14, and pins 8 and 9 to pin 7. K3DE also suggests that one of these gates will provide a buffered output signal for frequency checking by connecting pins 1 and 2 to pin 4, taking the output signal from pin 3.

THE FOUNDATION

A PROGRESS REPORT

The largest single contributor to the Foundation to date is William J. Halligan, W9AC, founder of The Hallicrafters Company. Bill presented his check for $10,000 to Foundation President W1QV at the ARRL National Convention in New York last July.

When the Board of Directors of The ARRL Foundation, Inc., holds its second Annual Meeting later this month, the Directors will have an opportunity to review an initial year of steady progress in fund raising. The Foundation's basis and purpose is to finance projects for the furtherance of amateur radio, generally along lines established by the ARRL Board. The first order of business has been the amateur satellite program, but the scope of the Foundation's activities is by no means limited to this; a fund designated for a scholarship program was started early on, and other worthwhile projects are under active consideration.

The first grant by the Foundation was for $13,000 to the Radio Amateur Satellite Corporation (Amsat) for operational support of Oscars 6 and 7. Another $19,000 designated for the amateur satellite program and $4500 for other programs has been contributed.

Very often, people ask themselves, "The Foundation sounds fine, but why should *I* contribute?" Excerpts from two letters we have received may help to answer this question.

● Amateur Radio has had a most profound influence on my 66 years, and I do indeed appreciate the opportunity to help youngsters along in this very enlightening and valuable cause.

I remember at an early age, helping my father in his "Wireless Lab," winding Spider Web Coils, assembling Crystal Dectors, and a host of similar wireless products that my father had invented. Further, the opportunity to assist a blind lad (who played a banjo on Wall Street for a living) to build a shock-proof, 50-watt portable transmitter, so that he could move from town to town to earn a living, was a most rewarding experience, and a great influence on my lifetime philosophy of hiring the handicapped.

As a member of the President's Committee for such employment, and having received a host of awards for encouraging industry everywhere in this respect, the early teachings of Amateur Radio and the many benefits therein have been a great fulfillment in my life, and something, the memory of which I will always revere. – *Eugene T. Turney, Jr., ex-W2APT. In Memory of my Father W2ANG*

● The Broward Amateur Radio Club, Inc., wishes to honor its Silent Keys. To do this, we have decided to send a contribution to The ARRL Foundation, Inc., in the name of such Silent Keys. We would like to be assured that the Foundation will acknowledge the contribution to the family of the deceased, and send our club a copy. We respectfully suggest that the Foundation suggest this method of honoring Silent Keys to other ARRL affiliated clubs, which would serve a dual purpose, the second being the furtherance of amateur radio through the Foundation's projects. – *Morris Rosenberg, WB4WQM, Secretary, Broward Amateur Radio Club, Inc.*

EITEL – HOOVER MATCHING FUND PROGRAM STILL OPEN

How do you make one dollar do the work of two? By contributing it to the ARRL Foundation and designating it for the Eitel-Hoover matching fund program in support of the Oscar amateur satellite program, that's how. W6UF and W6APW have offered to match, dollar for dollar, up to 25,000, any contributions so designated. As of press time, supporters of the Amsat-Oscar program had contributed $16,000 toward this goal, leaving another $9,000 still available to be matched.

At the time of the launch of Oscar 7, newspapers across the country reported that the satellite would have cost $2,000,000 had it been built commercially, but that the actual cost was about $60,000 because it was put together by volunteers from left-over parts and contributions from interested corporations and individuals. In other words, the satellite's cost to radio amateurs was about 3% of its commercial value. Where else can you get such value for your money?

Contributions should be made payable to The ARRL Foundation, Inc., and should be sent to Headquarters: 225 Main Street, Newington, CT 06111. Don't forget to mention the matching fund designation, if this is your desire.

DX: What Frequencies? What Times?

BY JOHN B. IRWIN,* K6SE/2

DO YOU HAVE a new transceiver and a few dozen different countries under your belt? You've found out that DX-hunting is habit-forming and is more fun than fishing -- much more -- and you're hooked. Your attitude towards DX is akin to that of the effervescent blonde, who when asked what type of man she liked best, replied: "Is there a difference?" You eagerly answer, bright-eyed and bushy-tailed, any "CQ DX" whether from a KH6, a G3 or perhaps an exotic rarity such as JØKER or UBØOB. The attainment of DXCC is months and months away and appears only just possible; the DX Honor Roll seems an impossible dream, years away at best. You have much to learn; you know that 88 means "love and kisses" but you don't know *yet* that Box 88 means a year's delay of a vital confirmation. You have learned that 10 and 15 meters are dead at night, and that calling "CQ DX" doesn't help too much. An Old Timer tells you to *listen:* but where? and when? The purpose of this article is to answer in part these pertinent questions and to accelerate *your* progress in this fascinating chase. There is no reason why you can't work more than 100 countries in a couple of months of part-time operating, even "barefoot" to a dipole, provided you know *where* and *when* to listen.

What I have done is to analyze 10 weeks of Red Eyed Louis (a composite fictitious character of 50-60 DXers), who publishes weekly lists of DX stations in the *West Coast DX Bulletin* -- their calls, frequencies, GMTs and dates; and whether heard on the East Coast, middle west or in the far west. The period covered is from Feb. 10 to April

* 578 Morris Ave., Elizabeth, New Jersey 07208.

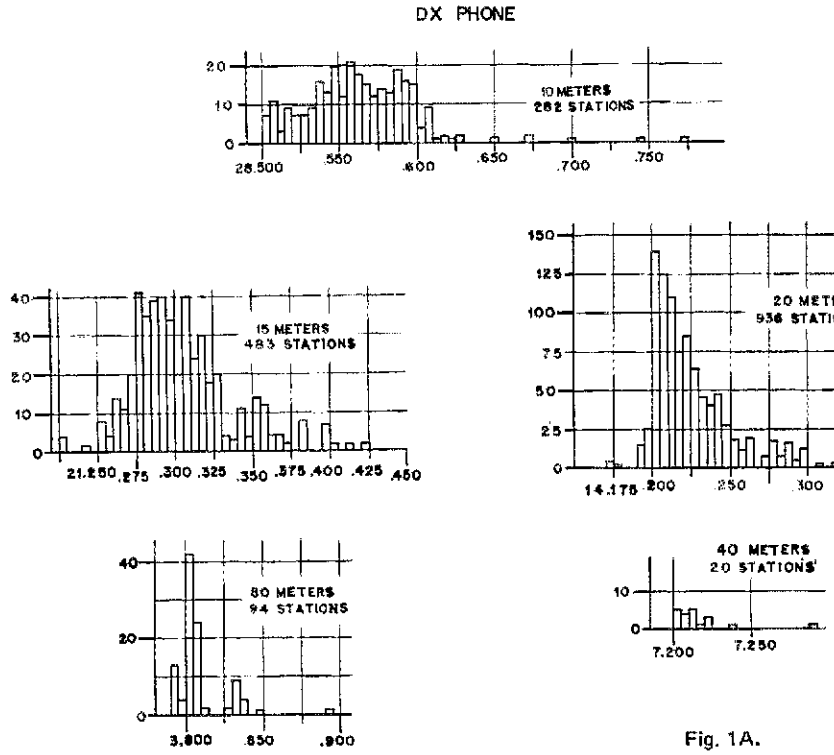


Fig. 1A.

23, 1972, a time when the band conditions were changing rapidly and when there were an unusual number of good openings on 10 meters. The *Bulletin* is slanted (biased) to those *United States* DXers with from 100-200 countries to their credit, so that many garden-variety countries are omitted – VK, ZL, JA, G, F, LU, etc., etc. Further, the Novice bands are not covered. Even a quick glance at the distribution in frequency of these DX stations as given in Fig. 1A (phone) and Fig. 1B (cw) will show that the majority of them are in forbidden territory for the General Class license. If this is what you have, just pull the power plug, close the log book and start studying the *License Manual;* you need an Advanced ticket as fast as possible. If you have only a Novice license you should immediately invest 9 bucks and 40 hours in a couple of long playing code records; they do very nicely at half speed – 16 rpm – in the beginning.

A closer look at the 20-meter DX distribution in Figure 1A shows a small but definite tail shortward of 14,200; but you won't need the ability for split-frequency operation provided you're completely satisfied to wait another 3-4 years for Revilla Gigedo and such. We see from Figure 1B that an Extra Class license is *much* to be desired for *cw* DX – and will be more necessary on phone with the new phone band allocations. So back to the LPs for another 40 hours of code listening.

Where to listen? You'll hear *most* of the phone DX from 28,535 to 28,600, 21,275 to 21,320, 14,200 to 14,230. If you tune through the entire band, you're just wasting time in arid "country" and by the time you catch up with a rare one he's already started a pileup and you're in a nearly hopeless competition with a bunch of "rock crushers." So tune back and forth over a limited range of frequencies; just how large a range depends on band conditions. If they are good, there will be many DX stations and they will spread out more.

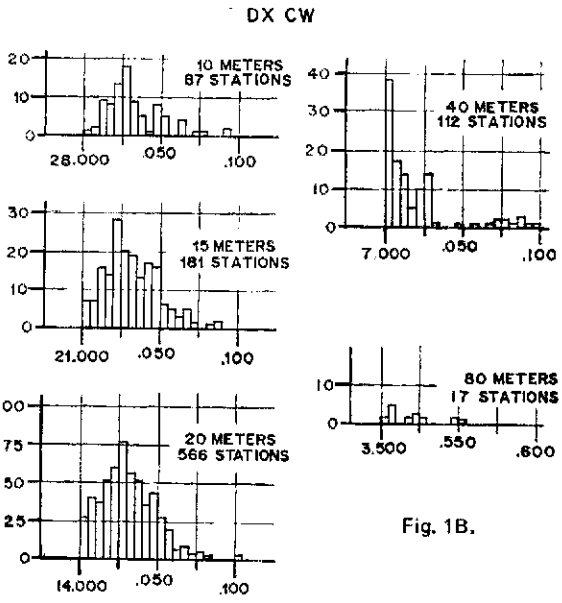
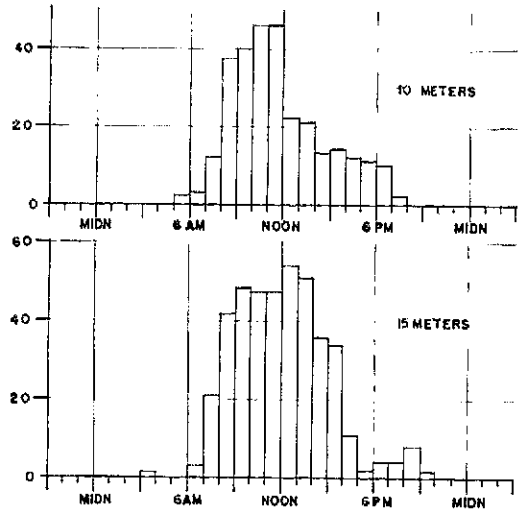
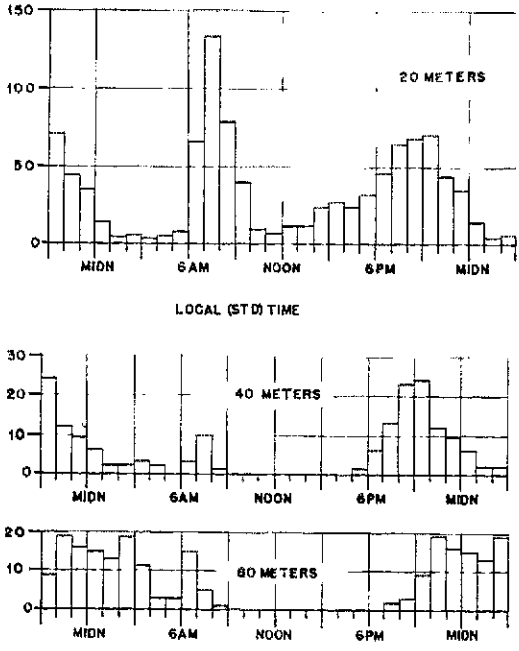


Fig. 1B.

When to listen, on what band? Just consult Figures 2A and 2B, remembering to subtract one hour from your own clock time if its on Daylight Time. Note that the vertical scale for 20 meters is compressed by a factor of 2-1/2; this is *the* DX band. So set your alarm for 5:45 AM and ride the peak! And remember that the distribution in time and band may be something else again next summer – and something else yet again in future years with less solar acne predicted. If you're really curious as to the latest "word," make up your own histograms – one *Bulletin* will suffice. It goes very rapidly – perhaps 1-1/2 to 2 hours – the second time around at least.





Figs. 2A and 2B.

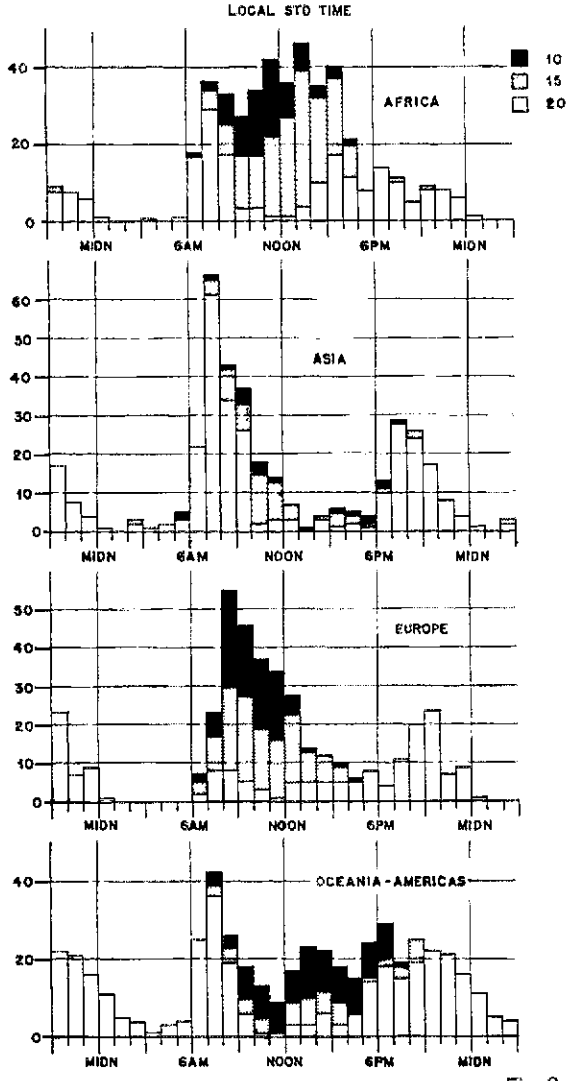


Fig. 3.

Figure 3 breaks up the world into four areas and each area shows its own characteristic pattern of time and band. Again, these patterns should change somewhat, perhaps drastically, with the seasons and with the sunspot cycle. Then too, there are always dramatic day-to-day fluctuations.

A few concluding general remarks are in order. (A) These distribution patterns as shown in Figures 2 and 3 should be more useful than propagation forecasts, provided they are kept up to date. They are based on more recent data of actual DX stations worked; it is of little use to know that propagation is fantastically excellent into Lower Slobbovia if it's 3 AM there and everyone is asleep. (B) DX is mainly a *daytime* activity at present and every continent should be available much of the day, on some band or other, provided the bands are open. (C) 65% of the DX activity is on phone (ssb) and only 35% on cw. This must be a dramatic turnaround from what went on 20 years – or even 10 years ago. Undoubtedly the advent of ssb has caused a great switch to phone; this trend should continue. (D) The only exception to this is the 40-meter band where the phone allocations seem to be specifically designed to inhibit international phone communication as much as possible – an outstanding administrative failure. This band *should* be our *best* DX band in the coming 3-5 years of sunspot minimum, but won't be unless the 40-meter phone allocations are changed. And lastly, (E) the phone frequencies as shown in Figure 1A are the U.S. phone allocations *as used by the DX stations.* To say it another way – the DX stations *use* – extensively – the same phone frequencies that we use – a point to remember when foreigners complain strongly about a possible extension of the U.S. phone allocations.

These DX patterns surprised me, in part at least. I expect them to be most useful and they should be for you too. But you may find me in a most unlikely spot at a most unlikely time: 14,265 at 2 AM. I need about 20 of those beautiful Pacific Island countries, and when and if the 20-meter band is open in the wee small hours, the friendly Pacific DX Net should help me do the trick. So don't forget the Nets – and the DX Contests.

My thanks are due to Mr. R. E. Louis, the watcher of the lonely night – all of them – who supplied the basic data, and will continue to do so. QST

STOLEN EQUIPMENT

2 meter standard SR-C826MA No. 205182 was stolen from my car. J. Kuperman, WA3IFX, 1934 Devereaux Ave., Philadelphia PA 19149.

– . . . –

Swan 700 CX with 16 pole filter, No. 1630855, microphone, speaker, complete HR2-B two-meter fm rig with 10 crystals. Mary Ryden, K8ONV, P.O. Box 73-88, Milan, OH 44846.

– . . . –

Clegg FM-27B taken from truck on October 6. No. 27043-1541. Mike and a locking-type mount were also taken at the same time. Carroll Thieme, K3HPI, 2675 Mt. Rose Ave., York, PA 17402.

– . . . –

Standard 146-A handie talkie, (No. 310377) along with matching Standard Mini-Mike, was stolen September 16, 1974. Hy Chantz, WB2HYW, 921 E. 105th St, Brooklyn, NY 11236.

– . . . –

Swan FM-2X, No. 11087 Housing and Coil assembly, Hustler 2 meter antenna. Stolen from WA1CRY. James F. Curtin, 34 Mitola Dr., N. Kingstown, RI 02852.

– . . . –

Stolen from the MARS Radio Station, Fort Meade, MD was: Five Collins Model KWM-2A transceivers, Nos. 11359, 10731, 10095, 11218, and 16066; two Collins Model 30L1 amplifiers, serial Nos. 10620 and 11012; three Collins Model 312B-5 control radio, serial Nos. 10016, 10394, and 59502; one Collins Model 516F2 power supply, Serial No. 18607; three power supply, Serial Nos. 12046, 12045, and 12015; two radio receivers, Serial Nos. 2918 and 1168; one Multimeter, Serial Nos. 11065. Anyone having any information concerning the above items should contact their local FBI office.

FCC ISSUES RESTRUCTURING PROPOSALS

Establishment of two new classes of amateur license, plus sweeping changes in licensing procedures – as well as frequency, power and emission privileges – are encompassed in the long-expected "restructuring" proposal released by the Federal Communications Commission early in December. The new architecture of Docket 20282 responds to some 35 rule-making petitions which have accumulated in the past several years, and generally reflects specific items mentioned by FCC personnel in appearances before amateur groups the past year or so.

As anticipated, FCC says we should have two routes of incentive licensing. One would be the present basic hf ladder of Novice to General to Advanced (and Extra). It is termed Series A, or the "short-wave" domain, defined as below 29 MHz. The second would be an expanded vhf-uhf progression with a new "Communicator Class" as the entry point to feed Technician ranks, and, beyond it, an "Experimenter Class" – a sort of "super-tech," paralleling the Advanced level. An amateur would thus have to hold two types of license authorization to operate both below and above 29 MHz. The Extra Class would remain the top objective; the holder of both the Advanced and the Experimenter grades would need only the 20 wpm code test as a final hurdle.

For the Novice there are two significant changes proposed – a five-year license, and 250 watts plate input! His vhf counterpart, the new Communicator, would be permitted identical power, but limited to F3 emission where permitted on all bands above 144 MHz. All exams would normally be by the volunteer examiner system for both classes (see later comment on new procedures).

Proposed Changes in Privileges

The General Class would have all present frequency privileges below 29 MHz, but FCC would impose a limitation to A1, A3, and F3 emissions only – no more SSTV, RTTY or other less-usual modes. Power for this and higher classes would henceforth be measured in output, 500 watts PEP for Generals. The Technician would be permitted the same three modes of emission on frequencies where authorized above 50 MHz, with the same power limitation. The Conditional would disappear as a separate name, and become a special "C" endorsement on General licenses, while a "D" endorsement would indicate a mail exam passed by a handicapped individual. In such cases the licenses are termed "conditionally issued."

The Advanced Class makes out well – 2000 watts PEP output, with all modes of emission available below 29 MHz; he gains the voice subbands formerly limited to Extras, and is excluded only from the low-end cw segments. The parallel Experimenter similarly has all privileges, but above 29 MHz, and identical power. Both exams may be taken by mail if physical handicaps or distance from an exam point are judged by FCC to be a sufficient travel hardship.

The Extra Class (the prefix "Amateur" is dropped) would still be king of the hill, of course, though with some changes: he gets the increase to 2 kW output – plus a lifetime operator (but not station) license! – but will have to share his formerly exclusive phone segments with Advanced licensees.

Conversion Equivalents

"Grandfathering" procedures are fairly liberal, but a few privileges still will be lost in addition to the Advanced-Extra switch just mentioned. On application the Advanced can pick up an Experimenter Class "for free" so as to retain all frequencies previously available. The General (and Conditional) will obtain the corresponding Technician grades without extra exams, but will lose 29.0-29.7 MHz – and the right to use slow-scan, radioteletype and any other emissions not falling into the A1, A3 or F3 categories unless he tackles the Experimenter or Advanced Class. Also, his 500-watt output limitation won't quite equal the present kW input measurement. The top section of 10 meters obviously is being held out as a carrot for Techs to upgrade to Experimenter. Present Techs will be grandfathered (upon application) with Novice privileges, however; only new ones after

adoption of the proposal will be limited to above-50 MHz.

Examination Procedures

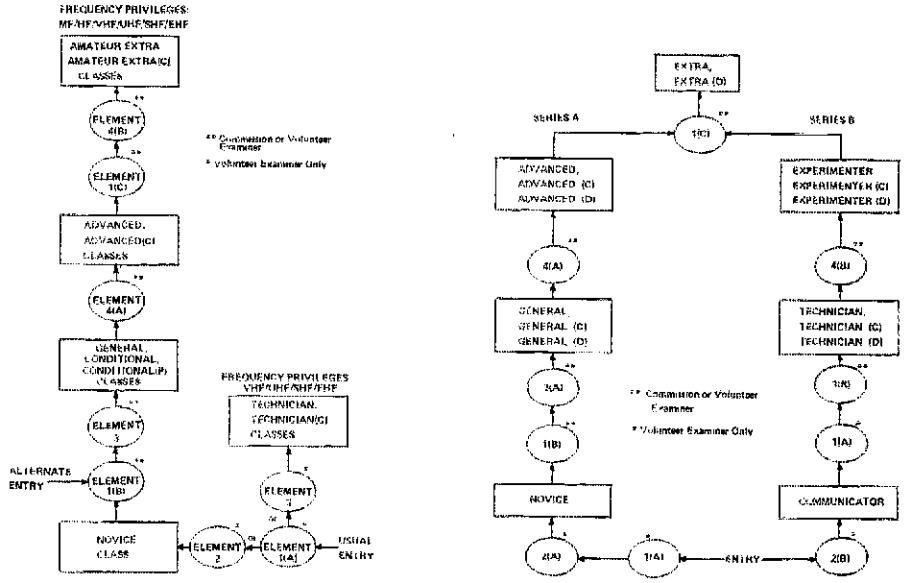
Present Elements 2 (basics of law and theory) and 3 (general practices and regulations) would be split into A and B parts, and expanded as necessary to cover the techniques applying to each of the two spectrum divisions.

New procedures on exams by mail would require two volunteer examiners, neither related to the applicant, both 21 years or older, and at least one licensed at a higher level in the same track. Generals could no longer be principal examiners; an Extra could give any exam, but (broadly speaking) an Advanced would be required to give Novice and General (C) exams, and an Experimenter for Technician (C) exams. Any of the three top grades could proctor a Communicator exam. Licenses obtained by mail exam procedures with (C) endorsement are "conditionally issued" and would be good for one five-year term only; no renewals except in the case of the handicapped, where reaffirmation of physical condition is necessary. Novice and Communicator grades, however, will be renewable upon affirmation that the holder still meets all the rules requirements and standards for the license held.

Writing these *QST* pages more than two weeks past normal deadline has not permitted time for thorough analysis nor space for many miscellaneous details. We have noted several other items in the proposal – for example that station licenses other than the basic "primary" and "secondary" classes would be issued only to certain operator grades; a club station would require an Advanced or Experimenter, depending on which portion of the spectrum operation was intended, and repeater, link and space stations would require an Experimenter licensee.

Copies of the complete text of the FCC proposal are being sent to League officials and to all affiliated radio clubs. The Commission has allowed six months for study and comment, so there is time to make a careful and rational appraisal before formulating conclusions. The annual meeting of the ARRL Board of Directors will undoubtedly make this docket a main subject of discussion, but it is unlikely that a final position will be adopted so early in the available comment period.

More details next month. QST



Present (left) and proposed (right) structure of operator license classes and examination elements. Elements are: 1(A) 5 wpm code; 1(B) 13 wpm; 1(C) 20 wpm; 2 basic law and minimal theory, to be expanded to A and B section appropriate to portion of spectrum involved; 3 general practices and regulations, to be similarly split; 4(A) intermediate theory, and practice, to be upgraded to advanced principles in the hf channel; 4(B) advanced theory and practice, to be revised as the top technical exam on the vhf ladder.

Annual ARRL Novice Roundup Announcement

February 1 through February 9

Novices, this is *your* contest. You can improve your code speed to help prepare for that higher class exam, and you can also work new states to increase your WAS total. The contest is 9 days long, but you can only operate a maximum of 30 hours during that period. Those of school age can still get homework done, and Novices slightly older can get the beauty rest they need.

During the contest, after calling CQ, listen on either side of your frequency for an answer; not everyone will have a VFO.

Contest log forms, dupe sheets (Op Aid 6), WAS maps and other operating aids are available from ARRL Hq. Send us a stamped, self-addressed envelope for some right away. After the contest, send us your log along with comments and photos. Logs become the property of the ARRL and cannot be returned, so make sure you still have a copy of your log. Entries must be postmarked no later than March 5, 1975, and must be sent to ARRL Hq.

How to Participate

Contest QSOs are much briefer than ordinary ragchews. You should not repeat your transmission (call, RST and section) at all unless you're requested to do so. Here's the way a typical exchange might go:

CQ NR CQ NR DE WN4VMC WN4VMC WN4VMC NR K

WN4VMC WN4VMC WN4VMC DE WN9AXP WN9AXP WN9AXP AR

WN9AXP DE WN4VMC 579 TENN BK

ROUNDUP PERIOD

Starts	*Ends*
February 1	February 9
0001 (12:01 A.M.)	2359 (11:59 P.M.)
Greenwich Mean Time	Greenwich Mean Time

WN4VMC DE WN9AXP R 569 ILL K

WN9AXP R TNX 73 SK DE WN4VMC NR K

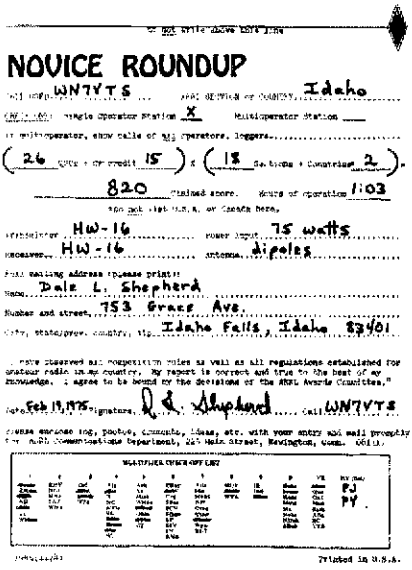
In most cases your state is your section. However, new hams in PA NJ NY MA CA FLA & TX should check page 6 of any issue of *QST* to learn their exact section (within the 16 ARRL divisions). If you still don't know your ARRL section after referring to page 6 of *QST*, drop us a card and we'll help you out. Generals: *don't* call CQ NR; *answer* Novice CQ NRs.

Note that time is expressed in Greenwich Mean Time (GMT). If you're unfamiliar with GMT, remember that it's 5 hours ahead of EST, 6 ahead of CST, 7 ahead of MST and 8 ahead of PST. Better yet, send for our handy Operating Aid †14, which contains, among other goodies, a time conversion chart and explanation of the RST system.

Scoring

Count one point for each contact (you may work a station only once, regardless of band); add your ARRL Code Proficiency credit, then multiply by the total number of multipliers (sections + countries) worked. And remember, KH6 KL7 KP4/KV4 KZ5 and VE districts are sections and

(Continued on page 153)



NOVICE ROUNDUP

WN7VTS ... Idaho

Single Operator Station X Multioperator Station ___

(26 QSOs × 2 credit 15) × (18 Sections + Countries 2) =

820 Claimed score. Hours of operation 10:03

Rig: HW-16 power input 75 watts

Antenna: HW-16 antenna dipoles

Name: Dale L. Shepherd

Number and street: 753 Grace Ave.

City, state/prov., country, zip: Idaho Falls, Idaho 83401

"I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge. I agree to be bound by the decisions of the ARRL Awards Committee."

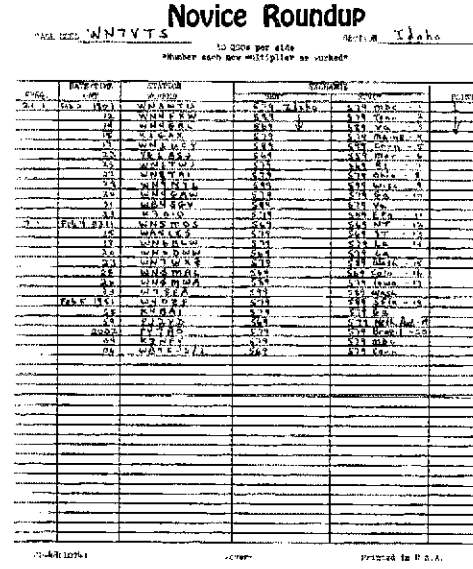
Feb 15, 1975 Signature: D. L. Shepherd Call: WN7VTS

Please enclose log, photos, comments, ideas, etc. with your entry and mail promptly to: ARRL Communications Department, 225 Main Street, Newington, Conn. 06111.

WEATHER CONDITIONS

Printed in U.S.A.

Sample summary sheet



Novice Roundup

Call used: WN7VTS Section: Idaho

10 QSOs per side

Number each new multiplier as worked

Printed in U.S.A.

Sample log sheet

AMATEUR RADIO PUBLIC SERVICE

NTS RACES AREC

In the Public Interest, Convenience, Necessity HRH

CONDUCTED BY BILL MANN,* WA1FCM

On Handling Public Service Traffic

IN A RECENT ISSUE of Auto-Call, W3DTN paraphrased some comments from the San Diego Repeater Association's Bulletin *Squelch Tales*. Here is what Gary related:

"Many operators monitor some favorite frequency for hours on end. One thing that is likely to make him mad is the case in which he has devoted several hours monitoring and finally responds to some public-service traffic only to have that traffic stepped all over by some other well-meaning but thoughtless operator.

"A case in point: WA3AAA responds to a call for assistance from WA4XXX who is spotty into the repeater. As WA3AAA switches to simplex, someone else, who is faster on trigger does the same thing and takes over the traffic. WA4XXX gets mad, turns off his rig and vows never to handle 2-meter traffic again. We have just lost a base monitoring station.

"Case number 2: K4QQQ takes an emergency call from K3RRR who is on the scene of a two-car serious-injury accident. K4QQQ calls the police only to find that K4YYY, who happened to be listening, has already made the call. K3RRR, who is now starting to calm down on the scene of the accident, calls K4QQQ with additional information concerning a third vehicle that was involved but left the scene. K4QQQ calls the police with this information. However, because he did not turn in the original report, the police dispatcher has difficulty trying to figure out what is going on and wonders if amateur radio operators really can get together on anything.

"POINT: *Unless you have information directly pertinent to the traffic being handled, or assistance is requested by the station who initially handles the traffic, shut up!*

"Additionally, the local police are becoming more and more disenchanted with amateur stations that report accidents, which upon investigation, turn out to be false calls. Two cars stopped by the side of a highway with the drivers talking to each other does *not* automatically mean trouble.

"POINT: *Do not report an accident until you have determined positively that there is, in fact, a need for assistance and that the authorities have not already been called.*"

Carmen Came In

When it became apparent that Hurricane Carmen would visit Louisiana on her tour of the Gulf of Mexico, preparations were made to accomodate her stay. We'll sketch the amateurs' preparations and situation which developed.

On the September 6 session of the Louisiana Traffic Net, SCM W5GHP called for a special LTN session for 1200 local time the following day. Members of the Medical Emergency Net met to plan emergency communications between hospitals in the New Orleans area and the mayor's office. Vhf PAM WA5KND helped set up an emergency repeater to be used as a backup. During the night, Carmen continued on a path that would lead directly to New Orleans.

Acting for EC WB5EKU who had been called to work, WA5NYY (Asst. SCM) contacted c.d. concerning possible shelters in New Orleans. The New Orleans c.d. was manned by Metropolitan Target Area club members and Jefferson Parish and New Orleans Red Cross were contacted. At 0900, W5GHP and SEC K5SVD discussed possible emer-

* Assistant Communications Manager, ARRL.

Some of the attendees of the Illinois Section CW Net (ILN) picnic were (bottom l. to r.) WB9FHL WB9JPS W9LQN K9ZTV (top l. to r.) K9BGL WB9OEH W9OYL W9NXG (Route Manager) WB9NOZ.

gency frequencies; FCC was advised. WB5CUQ traveled to Baton Rouge to get two generators.

At 1000, Central Louisiana ARC activated club station WB5MSS at Red Cross in Alexandria with stations at the weather bureau and c.d. hq. Meanwhile, the Monroe c.d. hq. was also being activated. And by 1030 W5SWS was setting up at the Terrebonne Parish Courthouse with emergency power available. Other areas active included WA5ZVB and others at Lafayette Parish using WR5AEF and K5DPG portable in New Iberia.

The special session of LTN was opened at 1200 by WA5NYY and good coverage was afforded over most of the state. It was decided to hold LTN sessions every hour on the hour and Louisiana Amateur Net (cw) sessions on the half hour. Local net sessions were advised for the half hour.

The Baton Rouge c.d. was manned by SEC K5SVD and others with State RACES Officer K5WMT at state c.d. hq. WB5FJU was at the Red Cross. When it became apparent that Lake Charles might be in the path of Carmen, c.d. operation by W5KHC began. EC W5SKW handled some health and welfare traffic.

At 1500, W5TRI placed LTN in continuous emergency session. Eleven hams were recruited to operate in 11 clinics for the following day (Sept. 8) if needed. By 1600, New Orleans area c.d. was linked to state c.d. hq. The Amateur Radio Club of Shreveport activated a 2-meter net on WR5ACV at 1600 and continued until midnight and then resumed at 0515 the next morning.

Liaisons were maintained between LTN, LAN, MARS and many stations reported into the Gulf Coast Hurricane Net. LTN was used primarily for intrastate traffic while LAN handled interstate traffic.

During the early morning hours of Sept. 8, Carmen left Grand Isle where she had been stalled and headed west-northwest. WB5MSS was net control on LTN through the night keeping the frequency available. By 0500 Carmen was moving inland. Weather reports were being forwarded to Esler Field Weather Bureau (Alexandria) since their RTTY link was not operational because of receiver failure.

As Carmen's threat decreased, operations were scaled down. W5SWS/5 ceased operation at 0930 after 20 hours and 43 messages. Most nets secured at 1000 after about 22 hours operation. LTN continued until 1300, Sept. 8, logging a total of 532 checkins and 95 messages passed.

Activities of the Louisiana radio amateurs were compiled in a bound notebook printed report by W5GHP. The report is being used to demonstrate public-service capabilities of amateurs when confronted with possible emergency conditions and is being distributed to interested public-service agencies in Louisiana.

Neighboring Mississippi also prepared for possible visitation from Carmen. By mid-afternoon, Sept. 7, the Hattiesburg ARC had set up at c.d. hq. and was monitoring activities in coastal cities. Later, a link was established with the coast and health and welfare traffic was handled.

Teach Your Children Well

The following item appeared in the November issue of the New York City -- Long Island Slow Speed Training and Traffic Net Bulletin produced by WB2EDW:

The shortage of amateurs with an interest in public service should be apparent to everyone reading this bulletin. Every year, thousands of people join the ranks of amateur radio, but few become involved in any part of public service.

These people had to learn their code and theory somewhere. Most likely, it was from another ham, or through a club-sponsored training program. While learning the code and theory, they should also have learned their responsibility to the public and ways of fulfilling it.

Any training program, individual or group, should contain sessions on traffic handling, procedure in a net and a good dose of the "whys" of public service. Too often, it seems, students learn enough to pass the FCC exam and that's it. Once licensed, they go on the air and mimic whatever they hear.

If you know of classes being held, offer to conduct a few sessions on public-service work, including one on traffic handling and net procedure. The would-be amateur has probably only been slightly exposed to amateur radio and hasn't really decided which direction he wants to take. Making public service look as interesting and

Snapped at the recent Southwest Division Convention in San Diego, California, was W6INI. He is a member of the ARRL Emergency Communications Advisory Committee, and is the San Diego Emergency Coordinator, Southwest Division Assistant Director and San Diego Section's Assistant Section Communications Manager.

The Central Area Staff held a meeting in New Orleans, Louisiana, recently, where this photo was taken. Front (l. to r.) WBØHOX, Tenth Region Net (Daytime) Manager; WØZHN, Central Area Staff Chairman and Member-at-Large; WØHI, Tenth Region Net Manager; W5MI, Central Area Staff Member-at-Large. Rear (l. to r.) WAØMLE, Central Area Net Manager; W9QLW, Central Area Staff Member-at-Large; WA5ZZA, Continental Traffic Net Assistant Manager; WA9EED, Ninth Region Net Manager; W4HFU, Region Net Five Manager; KØAEM, Transcontinental Corps – Central Director.

rewarding as we know it to be, will win many converts. In the bargain, the new ham will benefit from exposure to correct, mature operating procedures and techniques.

Last Call . . .

. . . for the 1975 Simulated Emergency Test slated for January 25-26. Check with your local Emergency Coordinator (or Section Emergency Coordinator, page 58, December 1974 *QST*) for news about activities planned for your area. There'll be plenty of net activity, too. Contact net managers in your section to determine net starting times.

National Traffic System operation will center around a complete Daytime cycle of NTS and the usual evening cycle. If you are normally a participant in only the NTS(E) cycle, don't bemoan the fact that an NTS(E) cycle is not being scheduled five hours earlier on Saturday and Sunday; participate in the NTS (Daytime) cycle. If you're usually on during the daytime, try the evening cycle. You may be missing half the "fun."

With the AREC

At the end of the month, you'll be busily participating in the 1975 SET. No doubt, there will be plenty to do, but we would like to suggest an additional function. We ask that you keep a pad of paper and pencil handy, to jot down your observations as the local test unfolds. What do you consider the highlights of the exercise? Are there common procedural errors being made? Do all net control stations route traffic correctly? What problems crop up?

Notes taken during the test will record some of the finer, yet important points that may be forgotten after the test has been concluded. Emphasize practices, not personalities. If the EC holds a critique session, you'll be able to add more to the discussions. From studying your notes, it may become apparent that changes should be made in the SET. Advise your EC or SEC. If comments refer to the SET in general, send them along to ARRL Hq. and/or your representative on the Emergency Communications Advisory Committee (see Sept., 1974, *QST*, page 69). We're always looking for ways to improve the SET. Your first-hand input will help.

■ For the month of October, 46 SECs sent in monthly reports. These represented 15,296 AREC members. In comparison, last year 40 reports were received covering 13,668 members. Sections reporting: Ala, Alask, Alta, Colo, Del, EMass, EPa, Ga, Hawaii, Ill, Ind, Kans, Ky, LA, Mar, Mich, Miss, Mo, Mont, Nebr, Nev, NLI, NC, NFLa, NNJ, NTex, Ohio, Okla, Ont, Org, Oreg, SV, SDgo, SJV, SBar, SCV, Sask, SFla, SNJ, STex, Utah, Va, Wash, WVa, WMass, WNY.

Traffic Talk

From time to time, someone suggests a handling instruction to indicate that the originator does not want a delivering station to have to "spring" for any expense, either for a toll call or postage. Handling instructions "B" (HXB) can be used, but it is more oriented toward time-value traffic. WB6PVH has suggested that HXG be designated to mean: "Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station."

The topic has been discussed in this column. Some "pros" and "cons" are related in August, 1972, *QST* (page 74) and October, 1971, *QST* (page 83). Any sentiment for or agin' from the traffickers?

■ Proper counting of traffic seems to be an area where there are some misunderstandings. We refer here to monthly traffic reports to the SCM, net reports from the NCS to net manager, net reports sent to ARRL for listing in *QST*, etc. Counting traffic is detailed in the booklet *Operating an Amateur Radio Station* which all radio amateurs should keep handy. (Latest edition available free as service to the membership . . . send a stamped self-addressed 6-1/2 × 9-1/2 inches or larger envelope with three units U.S. postage for first-class mailing.)

Only messages sent in standard ARRL format or correctly sent book traffic may be counted. Thus, "copy my number 5, this station, today's date, going to . . . etc.," cannot be counted!

All book traffic is counted the same – one point for every multiple of three messages in the book – regardless of whether you are originating, receiving, relaying or delivering the book traffic. For example, if you are originating a book of 8 messages and all are sent to the same station in proper form, you take credit for *three* originations *not* 8! The fact that you used 8 different message numbers has nothing to do with how the traffic is counted.

In order for a message to be counted, it must be rogered for. Since one does not acknowledge receipt for a W1AW bulletin, such a bulletin cannot be counted as a message received. A message (in proper form) to all net stations can only be counted by stations who QSL for the message.

■ *National Traffic System.* The Central Area Staff – one of three staffs set up to advise the ARRL Communications Manager on NTS matters

in their respective areas – met in New Orleans, Louisiana, October 4-6. The staff was in official session for over 8 hours, with many more hours of informal discussion. Attending members were: WØZHN (Chairman and Member-at-Large), WAØMLE (CAN Mgr.), W4HFU (RN5 Mgr.), WA9EED (9RN Mgr.), WØHI (TEN Mgr.), WBØHOX (DTRN Mgr.), KØAEM (TCC-Central Dir.) and W5MI, and W9QLW (MALs). WA1FCM was a participating observer from ARRL Hq. and there were several other observers at various times.

Action taken included:

1) WØHI was recommended as replacement for WAØMLE who resigned as Central Area Net Manager to return to school.

2) Elections were held for Members-at-Large with W5MI and W9QLW being re-elected and WØINH being returned to the staff as MAL. There was discussion on the question of whether to expand the number of MALs or to delete the position, with no changes made at this time.

3) WØINH was chosen as CAS Chairman for a term of two years.

4) WA5ZZA was recommended as the Assistant Manager for the Continental Traffic Net for the Central Area.

5) WØHI resigned as TEN Manager to take the job as CAN Manager. WØZHN was recommended as TEN Manager.

6) CAS voted to require all members of the staff to submit quarterly reports to the chairman detailing their activities. The chairman will consolidate these reports and make a report to ARRL. All staff members resolved to work closely with League officials in their areas of influence to increase the knowledge of and participation in NTS.

7) A lengthy discussion of SET format resulted in the recommendation to ARRL that SET consist of a regular full cycle of NTS(E) and one full cycle of NTS(D). Traffic not cleared during the daytime cycle would be routed into the evening cycle. It was the general consensus that a large overload would help all net managers locate their problem areas and move toward solving them.

Other topics discussed for which no specific recommendations were made included: terms for net managers; closer coordination of AREC and NTS, especially involving 2-meter fm; how to handle Florida traffic; realignment of some regions; BPL; PSHR; and net statistics.

■ *October Reports.* Support from Maryland to 3RN(D) is improving steadily, reports Mgr. WB2FWW/3, and NCS spots are very solid. RN7 dropped the 0430Z session and replaced it with one at 0145Z, and replaced the 0230Z sessions with one at 0330Z. This was because of conditions, says Mgr. W7KZ. RN7(D) Mgr. VE6FS thinks all their signals must be landing out in the Pacific Ocean. 8RN(D) Mgr. WA8MCR awarded certificates to W8PTT, WB8MGW and WB8MKL. Traffic has come back after a severe slump the last few months, writes RN5 Mgr. W4HFU.

Net	*Sessions*	*Traffic*	*Avg.*	*Rate*	*%Rep.*
EAN	31	1617	52.2	1.214	100.0
CAN	31	1172	37.8	.932	100.0
PAN	31	1080	34.8	.681	96.2
CTN	28	305	10.9	.209	70.9
1RN	62	569	9.2	.432	96.8
1RN(D)	31	178	5.7	.414	77.4
2RN	61	550	9.0	.778	100.0
3RN	62	476	7.7	.459	95.2
3RN(D)	31	173	5.6	.347	95.9
4RN	50	464	9.3	.412	77.2
RN5	62	911	14.7	.448	92.5
RN5(D)	31	55	1.8	.110	49.6
RN6	62	921	14.9	.524	98.4
RN6(D)	62	337	5.4	.182	56.0
RN7	61	279	4.6	.336	71.9
RN7(D)	10	11	1.1	.151	9.7
8RN	54	311	5.8	.319	84.9
8RN(D)	31	121	3.9	.440	74.2
9RN	61	562	9.2	.425	89.8
TEN	62	521	8.4	.470	87.4
TRN(D)	52	83	1.6	.103	28.8
ECN	61	281	4.6	.386	96.2
TWN(D)	22	9	0.4	.023	27.7
TCC Eastern	113[1]	664			
TCC Central	79[1]	610			
TCC Pacific	109[1]	813			
Sections[2]	4427	17268	3.9		
Summary	*5476*	*30341*	*5.5*		
Record	*4246*	*31117*	*16.4*		
Late Reports[3]					
3RN	60	389	6.5	.479	97.8

[1] TCC functions not counted as net sessions.

[2] Section and local nets reporting (136): APSN (AB), MTN (MB), APN (Mar.), CMN GBN ODN OPN OQN WOEN (ON), WQ-V/UHF (PQ), AENB AEND AENJ AENM AENR (AL), ASN (AK), ATEN HARC (AZ), OZK (AR), NCN NEN SCN (CA), CCN SSN (CO), CN CPN CSN NVHFTN (CT), DEPN DTN (DE), FAST FMTN FPTN GN NFPN QFN TPTN VEN (FL), GSBN GSN (GA), IMN (ID, MT), ILN (IL), IFN (IN), IA75MN TLCN (IA), QKS QKS-SS (KS), KNTN KTN KYN MKPN (KY), LAN LRN LSN LTN (LA), MDCTN MDD MEPN (MD), BCAREON EMRI EM2MN WMN WMPN (MA), MACS MNN QMN WSBN (MI), MSN MSPN PAW (MN), GCSN MSBN MSN MTN (MS), ACE JC2AN MoAREC MON MoSSB MSN PHD SCEN WEN (MO), MTN (MT), TCAREC TCEN WWNN (NE), NHVTN (NH,VT), NJN NJPN NJSN (NJ), NMN (NM), NLI NLS NYS (NY), CN NCSSBN THEN VHFTN (NC), BN COAREC-10 OSN OSSBN O6MtrN (OH), OFON OPEN OTWN STN (OK), BSN OSN (OR), CMTN EPA EPAEP&TN PFN PTTN WPA (PA), LEN SDN (SD), TN TNN (TN), TEX TEX-SS TTN (TX), BUN (UT), VNTN VSN (VA), NSN WSN (WA), WEN WVN (WV), BEN BWN WIN WNN WSBN WSSN (WI).

[3] September net report received before deadline but inadvertently not listed in December *QST*.

Transcontinental Corps

For health reasons, senior TCC Director W3EML has resigned directorship of TCC-Eastern. Bill assumed the post in mid-January, 1963, and under his leadership TCC-E grew from a scant dozen participants to double that in 1974 and a waiting list of stations desiring to pick up a TCC function. Although W2FR has taken over as TCC-E Director by the time you read this, we're sure Bill's ongoing dedication to TCC will be witnessed by his continued manning of TCC skeds and subsequent appearance of his call on the TCC roster.

Failures by TCC-Eastern were all because of conditions, reports Acting Dir. W2FR. KØAEM, Dir. TCC-Central writes November should be a better month with three new stations and one back with them on the roster. K5MAT, Dir., says TCC-Pacific traffic up, conditions down.

Area	*Functions*	*%Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	124	91.0	664	1797
Central	85	92.9	610	1254
Pacific	124	87.9	813	1665
Summary	*333*	*90.6*	*2087*	*4716*

The TCC roster (October): Eastern Area (W3EML, Dir.) – W1s NJM OYY, K1SSH, WA1s MSK SJR, W2s FR GKZ KAT/3, WA2s DSA PJL UWA, WB2s ELF PYM RKK, W3EML, K3s CB DZB MVO, W4UQ, K4KNP, WB4s OMG SGV, W8s PMJ VDA/4, K8KMQ, WA8HGH, WB8ITT, VE3SB. Central Area (KØAEM, Dir.) – W4OGG, WB4DXN, W5s GHP MI OU UGE UJJ, K5ETX, W9s CXY DND EI NXG, WA9EED, WØs HI INH LCX QMY ZHN, KØBIX, WAØTNM. Pacific Area (K5MAT, Dir.) – W5s RD TLK, K5MAT, WB5KSS, W6s BGF BVB EOT IPW MLF RSY UE VNQ VZT, WA6DEI, WB6s AKR OYN, W7s BQ GHT GYF KZ, K7s IFG NHL NHV QFG, WØLQ, KØDRL, WBØHCK.

Independent Net Reports (October)

Net	*Sessions*	*Traffic*	*Check-ins*
North American Traffic	27	285	541
20 Meter ISSB	21	1267	274
7290 Traffic	44	572	1974
Hit & Bounce Slow	15	77	147
75 Meter ISSB	31	384	1486
Ohio Valley Teenage	31	65	299
Northeast Traffic	23	61	199
IMRA	31	1388	2752
Eastern Area Slow	28	72	161
Mission Trail	31	216	804
Hit & Bounce	31	790	406

Public Service Diary

■ New York, NY — Aug. 7. WB2FCP heard LU8MBV on the air with emergency traffic. A heart patient in Buenos Aires, Argentina, needed a heart shunt bypass. A doctor was called and talked via phone patch and then sent out the valve on an airplane. Next day deliverery was confirmed with the help of CP1FW, HI8XAW and HC2KS. — (WB2FIG)

■ Lebanon, MO — Aug. 10. A windstorm caused the loss of phone service. In order for repairs to be made, KØDEW and KØDZD volunteered their services. Messages were relayed to WAØIKQ in Springfield for the company. — (KØDEW, EC Laclede Co.)

■ Squaw Mountain, CO — Aug. 27. WØUSE fell through a ten-foot-high scaffold while working on his home. His wife found him but could not call for help as they had no phone yet. She found the 146.34/146.94 handie-talkie and he managed to call for WØWYX who then called for help. — (WØWYX from the *Round Table*)

■ Many Farms, AZ — Sept. 4. WA7JUX/mobile 7 had been riding a motorcycle which hit an animal. While lying injured in a ditch, he called for help, and W6OUR, W6AFC, WA7HKV and W6PZJ responded. W6OUR called police while the others kept in contact with the injured man. — (WA6OBT, EC Thousand Oaks, CA)

■ Calhoun, MO — Sept. 5. A tree that had fallen across a highway was discovered by WAØBZW. He called KØOVD via repeater WAØVWQ, who then called police. — (KØOVD, EC Henry Co.)

■ Bellingham, WA — Sept. 8. WA7UGF/mobile 7 broke into the Columbia Basin Net. He had been in contact with a disabled boat taking on water but had lost contact. The Coast Guard was searching for it but couldn't find it. More information on the boat was relayed and WA7KDW phoned the Coast Guard and the boat was then found. — (W7IEU, SEC WA)

■ Riverside, CA — Sept. 8. A home-built aircraft appeared to crash, and witnessing this was WA6PZG. He and neighbors drove to where they thought it was, but couldn't find it. He got on the Crestline Repeater and while K6IIS and K6DQA acted as control stations, mobile units and WB6UZZ in a Marine copter searched the fields. The Civil Air Patrol was led by WA6SRW and WA6BMA who communicated to the base station. WA6MBK provided the link from the sheriff's office to the search area. After two days the wreckage was found. — (W6CPB, SCM Orange)

■ San Antonio, TX — Sept. 12. W5PPK/mobile 5 observed a car slow down and stop on the center line of a highway. He called police through WR5ABH and reported the stalled vehicle. — (WA5YXS, SEC STX)

■ Oshawa, ON — Sept. 13. An overturned car was spotted by VE3EBZ/mobile 3. Through VE3RPT, he contacted VE3GCS who called police. — (VE3EBZ)

■ Houston, TX — Sept. 21. An explosion in rail yard destroyed 400 rail cars, injured eighty people and killed one. Mass evacuation was coordinated for authorities by Harris Co. amateurs, who manned two command posts and fifty mobile stations. Communications were handled through WR5AAA for 27 hours. — (WA5YXS, SEC STX)

■ Middletown, NJ — Sept. 21. A storm knocked out communications including the police radio system. RACES members were dispatched in mobile units to various areas of the township to report situations to police. They also helped police units relay information back to headquarters. — (WB2NTL)

■ Merritt Island, FL — Sept. 26. K4DRV heard a ham from Lima, Peru, describe the beginnings of the earthquake which rocked the city, but the station disappeared. He monitored the frequency and stood by in case the relaying of information was necessary. Many health and welfare inquiries were relayed by K4AEA. — (K4DRV)

■ Long Island, NY — Sept. 3-27. Public service performed by members of the Long Island Mobile ARC included reporting 11 disabled vehicles, 23 accidents, two vehicle fires, two obstructions in roads, one inoperative traffic light and one downed power line. — (K2QPF, EC Oyster Bay)

■ Month of Sept. Members of the 20, 40 and 80 Meter Eye Emergency Net helped transfer 67 human eye corneas for transplant. Since Dec., 1962, 7349 cornea transfers have been handled. — (WA5FJN, Asst. EC Harris Co., TX)

■ Florence, Italy — Oct. 3. A sailor on leave found an American woman's purse on a train. He

Public Service Honor Roll October 1974

This listing is available to amateurs whose public service performance during the month indicated qualifies for 40 or more total points in the following nine categories (as reported to their SCM). Please note maximum points for each category: (1) Checking into cw nets, 1 point each, max. 10; (2) Checking into phone/RTTY nets, 1 point each, max. 10; (3) NCS cw nets, 3 points each, max. 12; (4) NCS phone/RTTY nets, 3 points each, max. 12; (5) Performing assigned liaison, 3 points each, max. 12; (6) Phone patches, 1 point each, max. 20; (7) Making BPL, 3 points regardless of traffic total; (8) Handling emergency traffic directly with a disaster area, 1 point each message; (9) Serving as net manager for entire month, 5 points.

WB5AMN	70	WB5IOS	50	WB4SVH	44
W4OGG	69	W2OF	49	WB5DCY	44
W4RQS	69	WA3RCI	49	W5FIJ	44
WB2FDW	64	W4AAY	49	WA5YEA	44
WB4ECB	64	WB4DJU	49	WB6AKR	44
WB5FDP	64	WB5BFW	49	WB6PVH	44
WA1MSK	61	WB5IGF	49	WB6TYA	44
WA1SHO	61	WB5JBW	49	WA7MEL	44
WA2DSA	61	K5MAT	49	WA9QVT/9	44
WB2FWW/3	61	W5RBB	49	K9ZTV	44
WB2PYM	61	WA6SCY	49	WBØIJV	44
WA3DUM	61	W7GHT	49	WAØROK	44
W5GHP	61	WB8KKI	49	KL7GCH	44
WA5IQU	61	KØMRI	49	VE3DVE	44
WA5ZZA	61	WØOTP	49	VE3FQZ	44
W7OCX	61	WØOYH	49	VE3GHG	44
KØBIX	61	WAØTNM	49	VE3SB	44
WBØHBM	61	VE3FRG	49	WA1MJE	43
WBØHOX	61	VE3GFN	49	WA3EOP	43
K4UNW	59	WA2OVE	47	K3IOG*	43
WA8MCR	59	WA6DBI	47	K7OUP	43
WA1QKD	57	WB9KZP	47	WB8NCD	43
WB5JZQ	57	WBØGVR	47	W9NXG	43
WA1POJ	56	WB4DXN	46	WA1TXI	42
WA1QJU	56	WB4ZSZ	46	W2KAT/3	42
WB2FLE	56	WA6TVA	46	WA4ZDW	42
WB2RKK	56	WB6VBG	46	WN5KNK	42
K3KAJ	56	K9KSA	46	WA5VBM	42
WA3VDO	56	W2EC	45	WAØKUH	42
WB4GHU	56	WB2LZN	45	KL7JDO	42
WBØCZR	56	WA2PCF	45	WA2PJL	41
K6GMI	55	K4JJO	45	WB4ZKG	41
WA1PHJ	53	W1RVR	44	WB5HVY	41
K3CR	53	WA1RGA	44	W6INH	41
W5GSN	53	WA2BSU	44	W6KFF	41
VE1AMR	53	K3OIO	44	VE1ARB	41
WB4FDT	52	WA3SXU	44	W3QU	40
W3FCS	51	WA3UKZ	44	WAØMLE	40
WA3PHQ	50	WB4FKJ	44	WØOF	40
WA4HBI	50	WA4IGS	44	VE5XC	40

*Denotes multioperator station.

asked his lieutenant commander, WA4JVL, to get in contact with a U.S. amateur to inform the lady he found it, and would return it when he arrived in the U.S. Several days later, the lady arrived home and received a note from W4GXT saying her purse would be returned soon. – (W4GXT)

■ Baja California, Mex. – Oct. 4. WA6UBU and K6IPJ were traveling and came upon an auto accident involving two seriously hurt men. Assistance was called and a contact between WB6GQK, WA6YOP and WA6DXJ was broken in order to relay the information to the parents. – (W3WRE)

■ Newton, MA – Oct. 7. WA1IDA/mobile 1 saw a purse snatcher jump into a car and drive away. He followed the car and via WR1ABJ, notified police with the assistance of K1UAQ. The suspect was caught. – (WA1IDA)

■ Oswego, NY – Oct. 7. An automobile accident involving a small child was spotted by WA2LOW/mobile 2. He called via WR2ADF, and WB2LAW responded and called police. – (K2AOU)

■ Baja California, Mex. – Oct. 5-7. Authorities contacted the De Anza Rescue Team in El Centro, CA, to assist in searching for two geologists long overdue. Support communications members were notified and a net established. WA6ODQ and XE2BY were aeronautical mobile, but the men were not found. – (W6GBF, SCM SDgo)

■ Tilton, Northfield, NH – Oct. 9. A state of emergency was declared when both towns had no water because of broken water mains. W1BST and K1APQ kept the Red Cross in contact with Disaster Chairman, K1BCS, and Civil Defense Director, K1VXX. – (K1BCS)

■ Hudson Falls, NY – Oct. 9. Red Cross assistant emergency coordinator, WB2FRV, was contacted to help with a large warehouse fire. He contacted K2AYQ who activated the Glens Falls AREC net. Liaison was maintained with the Red Cross and some amateurs went to the scene, operating mobile. – (K2AYQ, EC Glens Falls)

■ Quito, Ecuador – Oct. 9. A woman was exposed to a rabid dog and needed a rare serum. WA4AXH was interrupted by HC1WP and asked for help in contacting the Communicable Disease Center in Atlanta, GA. By using a phone patch, they were able to have the serum flown out immediately. – (WA4AXH, EC Bedford Co.)

■ Chicago, IL – Oct. 12. WB9LQC was on the way to the hospital with his expectant wife, when he discovered they were lost. He heard a faint contact on repeater WR9ABY, and asked for directions. WB9PGZ gave the information but was weak, so K9RRF repeated it. WB9OXW and K9MTE went to 146.94 with WB9LQC after the latter was out of range of the repeater, and he arrived at the at the hospital promptly. – (WB9LQC)

■ Plymouth, NH – Oct. 13. A car in front of K1BCS/mobile 1, blew two rear tires. A quick call to WA1HNF through WR1ABU resulted in contacting the police who gave assistance. – (K1BCS)

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for October Traffic

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	273	938	829	82	2122
WØWYX	38	687	87	600	1412
KØZSQ	–	633	1	632	1266
W6RSY	70	552	469	8	1099
KØONK	152	372	353	18	895
K9CPM	29	337	95	222	683
W3VR	221	210	187	19	637
WA6YNO	23	282	242	40	587
WBØHOX	128	231	206	8	573
W2KAT/3	25	279	207	33	544
WA4AVN	24	247	239	8	518
WB4SKT	208	150	144	9	511

BPL for 100 or more originations-plus-deliveries

WA3KOP	343	W5TI	138	WB9KZP	110
WA9GJU	247	WAØYVT	120	KH6IAC	107
WF6VEN	231	WB2FDW	119	WA2PCF	106
WA3ATQ	172	WN5KNK	114	WB6VZI	105
W6RFF	172	WB5FDP	111	K4KDJ	104
		WB8ITT	111		

BPL Medallions (see December, 1973 *QST*, p. 59) have been awarded to the following amateurs since last month's listings: WA3UCC WB5CUR WA7JBM.

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 originations 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.

■ Macon, GA – Oct. 13-15. A search for two missing children was assisted by Macon Repeater Group members. The children were found buried in a cave-in with the help of WB4NKU, WB4OLL, W4VZY and WB4SBT. – (K4SLQ)

■ Denver, CO – Oct. 19. Thirty-nine amateurs stood by on alert for 8 hours until phone service was restored after a train accident severed lines. They set up a network with a taxi company and dispatched cars when emergencies occurred. Many blood deliveries from blood banks to hospitals were coordinated. – (WNØMWQ)

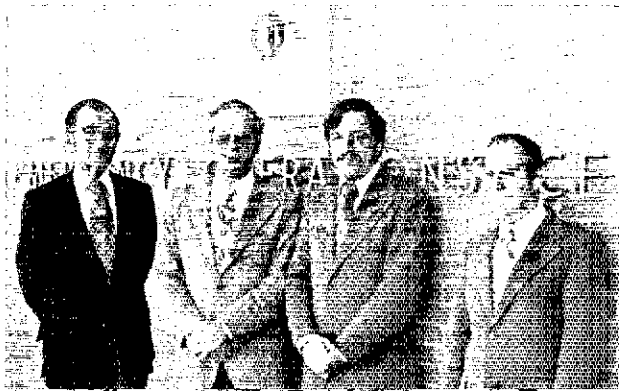
■ Cromwell, CT – Oct. 20. WB2FVD and WB2HTL/mobile 1 came upon an overturned car. They called for assistance through WR1ABM and WA1NLV responded and called police. K1PAI called police again after 15 minutes passed without sign of help. – (WA1OPB, EC Enfield)

■ Monroeville, PA – Oct. 25. While traveling, K3ISO saw a wheel fall off a truck and roll in front of 5 lanes of traffic. He requested help via the 146.37/146.97 repeater. WA3TQK activated the auto patch and secured the police. – (K3ISO)

■ Western PA – Oct. 25. A disabled car on I-79 was spotted by WA1ECV/mobile 3. He called through WR3ACH for assistance and W3HTH responded and called police. – (K3ISO)

■ Washington Co., PA – Oct. 27. The AREC/RACES group was activated to help locate a missing person. Five mobile units were sent out to

(Continued on page 155)



The communications setup at the State Emergency Operations Center in Nashville, Tennessee was examined by (l. to r.) W4CYL, Davidson County Emergency Coordinator; N.J. Carimi, State Civil Defense Director, who lead the tour; WA1FCM, ARRL Asst. Communications Manager; and WA4BCS, Net Control Station for the local RACES net.

FM REPEATER NEWS

Back in May 1974 *QST* we said that WR2AAA had the first repeater call-letter license plates. Turns out that claim was in error. Here are the 1973 plates for WR7ABH and they belong to Al Summers who runs a 28/88 machine in Benson, Arizona. It looks like Al was first.

Call for FM Repeater Directory Listings

An accurate Repeater Directory is a valuable operating aid. To keep the information up-to-date, Hq. will be mailing registration cards to current directory listings. In addition, we want *you* to ask for a registration card if: your repeater is not currently shown in the directory, or if a change has taken place in the information shown therein which might preclude receipt of the mailed registration card.

Only those repeaters shown in the directory with a 1974 registration date, or re-registered by April 1, will be listed in the upcoming directory.

Word from FCC is that nearly 1400 repeater licenses have been issued, with still a backlog of about 100 applications. ARRL has supplied over 3000 repeater licensing forms, so it appears that we still have a long way to go before repeater licensing levels off.

Adding Repeaters

There is still a great deal of confusion about putting additional repeaters on the air. Can they be under the same call, or must each repeater have a separate call? This question is popping up more and more as groups desire to add a 220 or 450 machine.

If the additional repeater is to be at the same address and with the same control methods as with the present installation, then you don't have to do anything as far as FCC is concerned. You must list the HAAT, erp, and other information necessary on Form A of ARRL repeater forms, and attach it to the station log — but you do not have to notify FCC. If the new repeater is to be at a different location than your presently licensed machine, and remotely controlled, then you must apply to FCC for another call. You can however, operate a manned, directly controlled repeater from any location using your existing repeater call and adding the portable designation.

Another question that is being asked: for wire or telephone control, do control stations need control licenses? The answer is no. As a matter of fact, you don't have control "stations" with a wire-controlled repeater. You have control operators who control the repeater from control *points*. A control *station* is only used for a *radio* remotely controlled repeater or station.

Still another question about control is this one: if you are already licensed as a control station for a radio remotely controlled repeater, are you required to modify your license to control another repeater? The answer to that is also no; once you are a control station you can control any number of repeaters. However, the repeater licensee must modify his license to add you to his control list. The trustee is the one who designates who the control stations are going to be and he must have that information on file with FCC.

Using Autopatch and Signing Your Call

The local FM Association says the FCC regs require you to identify the call of the repeater both before and after an autopatch. I have searched the rules but am unable to find anything concerning identification of repeater call signs while using the autopatch. I may be wrong, but I don't feel it is required to identify the repeater as long as the repeater does so every three minutes. Can you help?

This raises an interesting point. The rules are quite clear about signing. You must give the call (or net designator) of the station you are in contact with followed by your own call when you have completed the contact. This information is not required at the beginning of a contact — only at the end. When a station is using autopatch he is in communication with the *repeater* station. When he terminates the exchange of transmissions at the conclusion of the autopatch, he should identify the repeater station by its call sign followed by his own call. However, this is not required by FCC regulation at the beginning of the autopatch, anymore than identification of the station whom you are contacting is required. (This identification was required at one time, but has not been for several years.)

That's it for this month. Don't forget the repeater registration information. — *W1ICP/WR1ABH*

Here is the gang from the Sante Fe VHF society getting ready to install WR5AFP. What is unusual is that this is probably the highest repeater in the lower 48. The machine, 146.22/146.82, is located on Tesuque Peak, 12,107 feet above sea level. Is it the highest? Even if it isn't the repeater provides exceptional coverage in the Rio Grande Valley.

Hamfest Calendar

Illinois – The Wheaton Community Radio Amateurs annual mid-winter hamfest is Sunday, February 9, at the DuPage County Fairgrounds, Wheaton, 8 AM to 5 PM. Tickets $1.50 advance, $2 at the door. Free coffee and donuts 9-9:30 AM. For information and advance tickets send a stamped self-addressed envelope to L.O. Shaw, W9OKI, 4333 S. Villa Ave., Villa Park IL 60181. Advance tickets postmarked no later than February 2.

Indiana – The Fort Wayne hamfest is January 19 at Shiloh Hall (1/2 mile west of Indiana 3 on Carroll Rd.). Flea market, food. Tickets $1.50 at the door. XYLs and children under 12, free. Tables available at $1 for 4 feet. Talk-in on 28/88, 16/76, 146.52 and .94 simplex.

Michigan – Southfield Amateur Radio Club's Swap n' Shop is January 19 at Southfield High School, Ten Mile and Lahser Roads. Tickets $1.50. For more information on tickets and/or tables, write to Mr. Robert Younker, 24675 Lahser Rd., Southfield MI 48075, Atten.: Charles A. Tyrrell.

Ohio – The Intercity Radio Club's annual ham auction is at the Naval Reserve Training Center on Ashland Road in Mansfield Friday, February 7. Doors open at 6 PM. Look, swap, buy at 7:30 PM, auction at 8 PM. No flea fees nor commission charged. Eats. Donation of $2 at door.

Wisconsin – The West Allis Midwinter swapfest is Saturday, January 25, at Waukesha County Exposition Center located on Trunk Highway FT, southwest of Waukesha County Airport. (Directions: take Trunk Highway F exit on I-94 south 1.2 miles to County FT and west 0.8 miles to swapfest.) Doors open at 8 AM. Refreshments, breakfast and lunch available. Talk-in on 146.94. Rain or shine. Tickets $1 advance; $1.50 at door. For details write: WA9KRF, 4582 South Ahmedi Ave., Milwaukee WI 53207.

SOUTHEASTERN DIVISION CONVENTION

Miami, Florida **January 18-19, 1975**

January! Days of warm sunshine and balmy breezes. Nights just cool enough to remind you that other parts of the world have snow, sleet and bitterly cold weather. Where? In Miami, of course, at the ARRL Southeastern Division Convention and Tropical Hamboree! The big days are Saturday and Sunday, January 18 and 19, at the Bayfront Park Auditorium and the Everglades Hotel, just a half block away. Why not make these two days a fitting beginning or ending of a wonderful week where summer spends the winter? Meet your friends from the Caribbean and Latin America in the most Latin city in the U.S.A. Discuss the January Board Meeting with the Division Director and Hq. representatives. See how simple an Oscar station can be or get nostalgic at the QCWA antique exhibit. Drool over the latest and greatest in new equipment or browse in the big indoor flea market. For YLs and XYLs, a full afternoon of arts and crafts entertainment. Activities Friday and Saturday evening but no expensive banquet! Dade Radio Club is doing its part to "Whip Inflation Now" with no change from last year's $2 registration and $19 single, $22 double hotel rate. No deposit required for hotel rooms but reservations must reach the Club by January 10. Write D.R.C., P. O. Box 520073, Miami, FL 33152.

COMING ARRL CONVENTIONS

January 18-19 – Southeastern Division, Miami, Florida.
March 21-22 – Michigan State, Muskegon.
March 22-23 – Florida State, Jacksonville Beach.
May 2-4 – Pacific Division, Fresno, California.
June 7-8 – Georgia State, Atlanta.
August 1-3 – Canadian Division, Calgary, Alberta.
September 12-14 – NATIONAL, Reston, Virginia.
October 10-11 – Great Lakes Division, Columbus, Ohio.
October 17-19 – Midwest Division, Lincoln, Nebraska.
October 24-26 – Southwestern Division, Ventura, California.

NOTE: Sponsors of large ham gatherings should check with League Headquarters for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL Hq. for up to two years in advance.

1975 ARRL NATIONAL CONVENTION

The Northern Virginia Amateur Radio Council (NOVARC) is sponsoring the 1975 ARRL National Convention during the weekend of September 12-14, at the Sheraton Inn and International Conference Center, Reston, Virginia. The site is close to downtown Washington, D.C., but in the suburbs (near Dulles International Airport) and features plenty of free security patrolled parking.

NOVARC, composed of 16 clubs located in the metropolitan Washington area, also sponsored the very successful 1973 Roanoke Division Convention at the same site. The Foundation For Amateur Radio is also cooperating in sponsorship. The 1975 National will highlight the public service role of amateur radio, supplemented by a well rounded program covering the broadest technical and operational interests featuring "Something For Everyone." To name a few: antennas, ATV, contesting, DX, fm, homebrew, MARS, radio frequency interference/electromagnetic interference, solid-state technology, space communications, SSTV, etc.

A broad variety of exhibits by leading manufacturers in the amateur radio and related fields will supplement the weekend variety of activity. The ARRL Forum will be headed by President Harry Dannals, W2TUK, in addition to a number of directors and headquarters staff members. An FCC forum will bring a number of key Commission personnel before the convention. An "attitude adjustment party" followed by a gala banquet with a prominent speaker will be another convention highlight. Initiation (for ARRL members) into the Wouff Hong will take place at midnight Saturday (local time). A number of special interest meetings

(Continued on page 88)

Correspondence From Members-

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

HIGHER DUES

● Your publication is excellent and worth twice the newly increased rate. — *Buell A. Nesbett, K6PII/KL7DA.* You *too* will find out that increasing your prices will not solve your problems. Those retired may not be able to afford it. — *Barthold W. Sorge, W6OLC.* I believe the League is to be commended in keeping the membership dues as low as they have. — *James E. Muncey, W6HUJ.* Being of Scottish ancestry, I canna' pass up a bargain! Enclosed is my check for $15 for two years of membership in ARRL. And believe me, *that* is a bargain. — *M.W. McRae, W9RC.* I know the new fees are not effective till after the first of the new year. But I feel glad to give just a little more so that I feel I am giving my share of help. — *Emile H. Larose, III, WN5KNN.* I don't know how you can keep prices as low as you do. I am proud to be a member of the ARRL. — *Anthony J. Schreiber, III.* I have subscribed to *QST* and membership due to interest in amateur radio, but this may be my last year as your increase in dues is too much. I wonder how many members you will lose? — *Clarence M. Luyman.* Add another year, and what ever else this $10 will cover. It's amazing you can even publish your great mag at that low, low price. Why it's only 601L (Israeli Lirot) after the latest devaluation. — *Andrew Beran, WN3WFR/4X, Herzlia, Israel.*

ANTENNA ARTICLES

● I recently spent a very pleasant afternoon in the library at the University of Washington, searching through twenty years of *QST* for ideas on cheap, simple, sturdy, high-gain, low-loss, sharply-directional beam antennas that can be built using a roll of masking tape and parts from your kid sister's ten-speed bike. (Found a couple, too . . .)

Three principles seemed to govern antenna articles:

1) The number of articles and the amount of antenna experimentation seems to follow the curve of sunspot maxima and minima.

2) Just when you think an antenna design is completely exhausted, someone re-invents it more simply and cheaply and starts the whole thing going again.

3) Hams today are either generally richer or less inventive than their counterparts twenty years ago. Simple/cheap/ingenious designs seem to have disappeared from the pages of *QST* recently (maybe I have to wait for the sunspots!).

If you could reprint a few of those old articles, things might get jumping again — and if you OTs out there solved a sticky skywire problem thirty years ago with baling wire and brainpower, send it in! We impecunious Novices would sure like to hear about it! — *Dave Corry, WN7WPP, Seattle, WA*

QST ADVERTISING POLICY

● I am responding to the query at the end of the November editorial on *QST* advertising.

Emphatically I support present *QST* advertising policy. The reason radio amateurs have banded together in ARRL is to do those things collectively which we can't effectively do singly, at least at a reasonable cost. Validating advertising is one of those things. Were *QST* to relax this vigilance, then would disappear one of the reasons for existence of ARRL, specifically one of the reasons for membership therein. — *Carl Long, W0PJW (ex W3MBF) Boulder, CO*

● Do not lower your standards! *QST* has earned itself, at least in my esteem, worthiness beyond reproach. There are those who would put aside any degree of credibility for the fast buck. This is true in any industry — amateur radio is not exempt. *QST* can be (and should be) proud of its policies of policing the manufacturers, especially in this day of the "overnight wonder" . . . — *Bill Howard, WB4NAK, Orlando, FL*

● If it isn't advertised in *QST*, I don't buy it — it's as simple as that — *WA8VHA.* It appears possible that a portion of my 40 years of membership dues is directly chargeable to this (ultra-conservative?) policy. Perhaps, and even so I cannot begrudge one penny of it. — *W1JE.* Besides being a League member, I have also been sitting on the other side of the fence, with Spectrum International. The League advertising policy is correct. I would not want to see the high standards relaxed. — *G3BVU/1.* I did not know the extent to which you exercise caution for us. Please don't change your policy. — *W2ABE.* You may lose a few advertisers by this, but who wants to do business with firms who will not go along with this policy? — *W6QWX.* If for any reason you do change your advertising policy, please drop my name from your list, because then you have become just another magazine. If you don't protect my interest, who is going to? — *R. Kamalanathan.* It is indeed refreshing to see at least one organization in this day of "Watergate" thinking that can't be bought. — *K0PPO.* It is the function of the League to protect its members from fraud or misleading advertising. Skylane Products is all for you. — *W4YM.* I have seen ads in the other magazines, but I always wonder why they don't appear in *QST* — is something wrong with their advertising, or something wrong with their product? — *WA9HXD.* Ads in *QST* are looked upon by hams as kin to "Approved by Good Housekeeping" and "UL Approved." — *W5WK.* I never doubted that your policy statement meant what it said, but I never stopped to think how much trouble it must be to implement it. — *K4RJ.* Stick to your high standards — hams need someone to look after their welfare in buying electronics merchandise. — *W7TRQ.* The recent unfortunate experience at

Electronic News is an additional argument for your policy. A fraudulent ad offering "quality components" at "up to 60% off" reportedly netted $400,000 in small orders from industrial buyers for a non-existent distributor. – *W2UUH.* Firms with integrity will welcome critical scrutiny and make every effort to please a buyer. – *WA2RAI.* I have made it a rule only to order items from firms who advertise in *QST.* If an advertiser is unwilling to take a little extra effort to show that his product is as advertised, then I am not willing to risk my money with him. – *K3CX.* With the many fly-by-night businesses these days, a thorough investigation will prevent the possibility of shiny new equipment turning out to be a blind horse. – *WB0MBR.* I have always considered such publications as *Ham Radio, 73,* and *CQ* to be read now and then – but not very seriously. Consequently, I've never taken their advertisements very much to heart, either. – *K7ZHS.* Some standard must be set in this world of mediocrity and excuses. – *VE3APG.* At best, this advertising policy has always been hit-or-miss. Such plans, even with scores of people screening ads, are inherently ineffective. You should junk the policy, concentrating instead on editorially counteracting as Fast Buck Policy. – *W6PSB.* I am one of those who was "burnt" some years back. In all purchases since then made from *QST* ads, I have enjoyed complete satisfaction. – *W4SME.* If all publications followed your policy, the history of advertising would not be such a disgusting story. Your policy is the keystone of consumer protection. – *WB6DSK.* A lot of people depend on *QST* for gear, ideas, correspondence, etc., and how much faith can a guy have in a project article if he gets stung on an ad on the reverse side of the same page? – *VE1BCI.* We (amateurs) have a reputation of self-policing, and this is an excellent example of it. – *K4CAV.*

[EDITOR'S NOTE: Thanks to dozens of other members who responded in similar vein.]

PUBLIC DISSERVICE

● Recently, I was monitoring one of the most popular repeaters (2 meter) in the Washington, D.C. area and I heard the following. "QST, QST, QST, police radar in operation on the beltway between exits X and Y." The transmission was concluded with an amateur call sign. Such transmissions are quite common from truckers operating on the Citizens Band, but they seem out of place coming from the guys in the white hats. Or, are we to consider the alerting of the violator of the law to be a public service? It may be true that if you have it, a truck brought it. But it's equally as true that if a truck gets you, you've had it.

We would do well to remember that it's our tax dollar that puts the radar equipment in operation, and if allowed to function, it serves to remove the violators from our highways. Certainly the amateur radio operator who provides early warning for the violator is defeating this function, as well as our reason for being. – *H.M. Burns, W3FQH, Glen Echo, MD*

RADIO STILL ROTTEN?

● I would like to suggest that *QST* publish a reprint of the late and revered H.P. Maxim's (T.O.M.) articles on rotten operating. We have lots of rotten operating these days. Altho the stories were written in a nearly-forgotten era, these young whippersnappers might learn a few things. – *Martin C. Derksema, W7FZB, Idaho Falls, ID*

SECRET REVEALED

● I just recently passed my Extra Class exam, and I am as proud of that accomplishment as anything I've ever done. And, since I now know the "secret" I thought I'd pass it along. I really wanted to be sure that I passed the first try so, for insurance, I bought a cassette code tape ($3.95) and a study manual ($7.00), both highly touted by another amateur magazine. This was to be a back-up to my other practice methods. The code tape is terrible quality (it sounds like the publisher recorded it in his bathroom) and the code groups are just too boring to hold interest. And the manual . . . take the simplest theory question you can imagine, expand it into four or five pages of irrelevant material and you'll come close to duplicating this "helper." My advice is; don't waste your eleven bucks.

In the final analysis, there were just two things that got me through the Extra exam. The ARRL *License Manual* ($1.00) which I read and read and re-read, and a *daily* practice session for about a year with good old W1AW's 20-25 wpm code (Free). I'd like to say a big THANK YOU! to ARRL for providing these aids. They worked for me, and they can for anybody else who has a sincere desire to become an Extra. – *John F. Beckman, W4BTX, Atlanta, GA*

TAKING EXCEPTION

● As an ARRL member and C.I.E. student, I must take exception to Mr. Lee's letter in the September 1974 issue of *QST.* I'll be the first to admit that ARRL publications are great, but they're primarily reference manuals. With the C.I.E. course the material is presented in an order which makes learning electronics a fun thing. Further, each concept is checked with an exam – this is necessary for a true learning process to take place.

Perhaps it would be fair to say that ARRL publications do a nice job in the very narrow area of amateur radio communication, and C.I.E. does a nice job of exposing the much larger world of electronics.

I do think that C.I.E. is entitled to equal time to give their side of the picture. – *Joseph M. Cierniak, WN1UBW, Nashua, NH*

HIDDEN BONUS

● In view of the desire of ARRL to attract new members to the ranks of amateur radio, I am at a loss to understand why no one mentions a very obvious benefit that accrues to anyone obtaining an amateur radio license. I am referring to the fact that an amateur radio operator apparently automatically becomes an expert automobile driver upon receipt of his radio license. One only has to listen for a few momemts to mobile operators to quickly discover the truth of this statement. You will hear constant remarks from these mobile operators concerning the atrocious driving habits of "the other" drivers. Just what the relationship between amateur radio and driving expertise is, I have not been able to determine, but the fact that it does indeed exist is indisputable and I certainly believe that you are "missing the boat" in not making prospective hams aware of this wonderful bonus awaiting them. – *Bill Fisher, W2OC, Armonk, NY*

The Post Office Department promises faster mail service with Zip codes. Use yours when you write ARRL. Use ours, too. It's 06111.

Happenings of the Month

ELECTION RESULTS

In the November issue, we reported the uncontested reelections of Directors L. Phil Wicker, W4ACY, Roanoke Division; Charles M. Cotterell, WØSIN, Rocky Mountain Division; John R. Griggs, W6KW, Southwestern Division; and Vice Director George A. Diehl, W2IHA, Hudson Division.

The remaining 12 positions were decided in mail balloting with four incumbent directors and four present vice directors being reelected. One new director and three new vice directors were chosen.

In the Central Division, 12-year veteran **Philip E. Haller, W9HPG,** barely edged out D.C. Miller, W9NTP, for the director slot 2157 votes to 2109. **Edmond A. Metzger, W9PRN** vice director since 1965, garnered 2474 votes to 1771 for Kenneth A. Ebneter, K9GSC.

Hudson Division Director **Stan Zak, K2SJO,** won reelection over David Ferrier, W2GKZ, by a vote of 2177 to 1195; Stan moved up to the director's office in January, 1972.

Northwestern Division voters again chose **Robert B. Thurston, W7PGY** – for the sixth time – giving him 1444 votes against 1124 for Harry W. Lewis, W7JWJ. Vice Director Dale T. Justice, K7WWR, earned a second term in a three-way race: he got 1194 votes to 1101 for William R. Watson, W7BQ, and 261 for Harry A. Sievers, W7BAR.

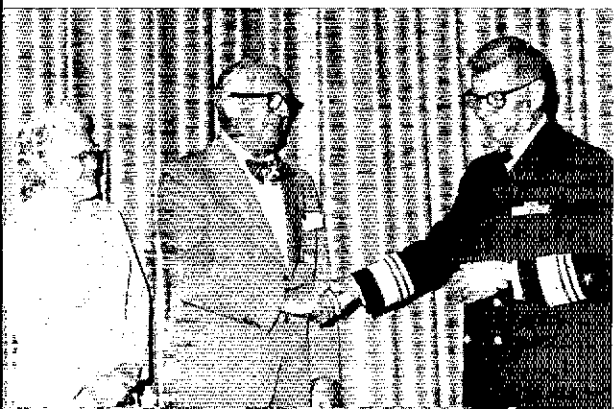
There was another three-way race in the Roanoke Division: Vice Director **Donald B. Morris, W8JM** – appointed in the Spring of 1974 to fill a vacancy – tallied 1290 votes to 988 for Phillip Sager, WB4FDT, and 114 for Kiernan K. Holliday, WA6BJH/4.

Roy L. Albright, W5EYB, director from the West Gulf Division since 1969, was reelected, receiving 1917 votes to 628 for D. William Smith, W5TVB. The voters also again picked **Jack D. Gant, W5GM,** vice director since 1972, giving him 1667 ballots to 871 for Thomas H. Morrison, WB5IZN.

The new director of the New England Division is **John C. Sullivan, W1HHR,** 45, of Columbia, Connecticut. "Sully" designs optical/electronic test equipment for the glass industry at Emhart Corporation. Ham radio positions include: vice director 1973-1974 and assistant director, 1971-1972, New England Division; section emergency coordinator, Connecticut; former officer posts with the Willimantic Radio Club and Connecticut Yankee Radio Club; communications officer, past radio officer, area 4, Connecticut Civil Defense; director, Columbia Civil Defense; and founder, past advisor, Radio Explorer Post 64 BSA. First licensed in 1955, W1HHR is a Life Member of ARRL. The vote was 2087 for Sully, 1083 for Fredric J. Hopengarten, W1NJL. Bob Chapman, W1QV, director for the past ten years, chose not to be a candidate this time.

A 35-year-old science teacher from Bristol, Connecticut, won the vice-director race. **John F. Lindholm, W1DGL** chalked up 1996 ballots versus 1171 for G. Peter Chamalian, W1BGD, in a contest of particular interest to the headquarters staff: both are former employees of the Communications Department! John has been an assistant director for the New England Division and SCM of the Western Massachusetts section, both in 1958-1959; past activities manager, Connecticut Wireless Association; emergency coordinator for greater Hartford; net manager, Bristol Emergency Net and assistant communications manager at hq., 1959-1962. W1DGL, also a Life Member of ARRL, was first licensed in 1954.

The Rocky Mountain Division picked **Maurice O. Carpenter, KØHRZ,** 60, of Denver to be its vice director, replacing Allen C. Auten, WØECN, who did not run. KØHRZ is a past president and past vice president of the Denver Radio Club; past communications officer, Ohio Wing, Civil Air Patrol; Colorado Post Office Net manager from 1961 to 1974; a member of RACES and Army MARS; formerly W9RDO and W4RDO, and licensed since 1932. Until his retirement, Maurice was regional performance appraisal officer, U.S. Post Office. In the balloting, he got 662 votes to 343 for S. Bud Schieving, WAØYIH.



Robert York Chapman, W1QV, director from the New England Division from January 1, 1965 to January 1, 1975 (and currently president of the ARRL Foundation) was recently presented the Navy Superior Civilian Service Award by Rear Admiral R. C. Gooding, Commander Naval Sea Systems Command recognizing his "significant contributions to the development of the quiet submarine forces the Navy has today," during 25 years of service. Bob retired this summer as Director, Acoustic Research and Development Division, U.S. Submarine Base, New London. Marge Chapman, no stranger to convention-going members in the Northeast, looks on during her OM's proud moment. *(U.S. Navy photo)*

Roy Albright, W5EYB, whose reelection as West Gulf Division Director is announced elsewhere in these pages, received the Kilocycle Club of Fort Worth award for "distinguished service to amateur radio." Making the presentation at left is Thomas W. Chance, Jr., WA5VJX.

Jay A. Holladay, W6EJJ, was chosen by Southwestern Division members as vice director: they gave him 1640 votes to 908 for the incumbent, Arnold Dahlman, W6UEI, and 802 for Clarence R. Mackay, K6OPS. Jay is 38, lives in La Canada, and works as an engineering supervisor at the Jet Propulsion Laboratory, where he is also a director and trustee of the amateur radio club and W6VIO. He's also been trustee of special events stations WP6JPL and WS6MVM; former officer of the Southern California DX Club; DXer of the Year 1970; editor SCDXC *Bulletin*; project manager, Amsat/Oscar test flight AA-3; chairman, Amsat/Oscar program, 1973 ARRL Southwestern Division Convention; and first West Coast WAS/Oscar 6. Licensed since 1950, Jay earlier had the calls W4SAT and K7IDI. He, too, is a Life Member of ARRL.

Our apologies to any members who may have received their ballots late. We have post office receipts for each division's ballots, variously dated October 8 through October 11, and we retain a carbon copy of the ballot labels. Some deliveries were reported as late as November 20 against post office service standards which call for a maximum of eight days in the delivery of second- and third-class mail at distances over 1,800 miles. A complaint has been filed with the post office. Fortunately, most of those we've heard from saw the election reminder in November *QST* and requested duplicate ballots in time.

RACES DOCKET 19723

In 1973 the Federal Communications Commission issued a Notice of Inquiry concerning the Radio Amateur Civil Emergency Service, asking whether it should be continued and, if so, on what terms. In the summer of 1974 FCC issued a Notice of Proposed Rulemaking (page 73, August 1974 *QST*) proposing actual rules changes. The League supports the general principles involved but after study by its Emergency Communications Advisory Committee has offered a few additional suggestions. ARRL has also filed Reply Comments responding to comments filed by other parties. Highlights of the documents are presented here:

. . . 2. At the outset, the rules should clearly set forth and define RACES as an Amateur Radio Service. Accordingly, it is recommended that Section 97.161 read as follows:

97.161 Basis and Purpose

The Radio Amateur Civil Emergency Service is an Amateur Radio Service conducted by volunteer licensed amateur radio operators, for civil defense communications purposes only, during periods of local, regional or national civil emergencies, including any emergency which may necessitate invoking of the President's War Emergency Powers under the provisions of 606 of the Communications Act of 1934, as amended.

3. The rules should recognize the amateur's own volunteer emergency corps as a highly effective organization operating as an emergency service. The following additional definition is recommended:

97.163 Definitions

(e) AREC Station. An amateur station whose licensee is a member of the Amateur Radio Emergency Corps.

4. Proposed Section 97.189 by exclusion seems to prohibit RACES stations and amateur radio stations registered with a civil defense organization operating in RACES from communicating with other amateur stations. The League feels that it is essential that free interchange of communications between amateurs and RACES stations be permitted. In support of this contention, the League offers the following arguments:

(a) There are extensive amateur radio emergency communications organizations and networks, such as the League's AREC and the National Traffic System (NTS), which are not a part of RACES. These can provide vital links not available to RACES in any other way. With the new frequency privileges proposed, RACES stations could check into these networks directly.

(b) In many cases, an isolated amateur station may well be the only communications facility in a disaster area. The regulations should permit communications between such a station and RACES, other than on an "anything goes-in-an-emergency" basis.

(c) Relief agencies, such as the Red Cross, use volunteer amateur radio operations for their communications support in disasters. These are not usually RACES stations, but the authority to contact RACES stations is essential to effective and efficient emergency operation and preparedness.

(d) Inasmuch as RACES is an amateur radio service, it is inappropriate to deny one segment of the service access to other segments, particularly when operating in support of an emergency.

(e) Allowing free inter-contact fosters the concept of a single amateur service dedicated to serving all agencies in an emergency.

(f) Enforcement of the prohibition of proposed Section 97.189 would seem impossible, since RACES-registered amateurs will not be on file at the Commission and casual amateurs may have no way of knowing whether a specific net operating in an emergency is a RACES net unless a distinctive call sign is used or the net devotes time to making announcements of its prohibited status.

5. For the foregoing reasons, it is recommended that Section 97.189 be amended as follows:

Walter Thain, WB4KKB, receives a Certificate of Merit from Walter Shriner, M.D., W9CBG, president of the Medical Amateur Radio Council (MARCO) for his outstanding work in procuring medical supplies for remote territories in South America. WB4KKB, of Miami, is a medical cytotechnologist. *(Photo via WB2YBA)*

97.189 Points of Communications

(a) RACES stations may only be used to communicate with:

(1) Other RACES stations.

(2) Amateur radio stations certified as being registered with a civil defense organization, by that organization.

(3) Other amateur radio stations operating in support of a disaster relief operation.

(4) Stations in the Disaster Communications Service.

(5) Stations of the United States Government authorized by the responsible agency to exchange communications with RACES stations.

(6) Any other stations in any other services regulated by the Federal Communications Commission, whenever such station is authorized by the Commission to exchange communications with stations in the Radio Amateur Civil Emergency Service.

(b) Amateur Radio Stations registered in a civil defense organization may only be used to communicate with:

(1) RACES stations licensed to the civil defense organizations with which the amateur radio station is registered.

(2) Other amateur radio stations operating in support of a disaster relief operation.

(3) Any of the following stations upon authorization of the responsible civil defense official for the organization in which the amateur radio station is registered:

(i) Any RACES station licensed to other civil defense organizations.

(ii) Amateur radio stations registered in the same or another civil defense organization.

(iii) Stations in the Disaster Communications Service.

(iv) Stations of the United States Government authorized by the responsible agency to exchange communications with RACES stations.

(v) Any other station in any other service regulated by the Federal Communications Commission, whenever such station is authorized by the Commission to exchange communications with stations in the Radio Amateur Civil Emergency Service.

. . . 9. It is most strongly recommended that the frequency tables of proposed Section 97.185(b) recognize the widespread use and effectiveness of 2-meter fm repeaters in emergency operations and make adequate provisions therefor. There well may be a critical need to use the vast number of 2-meter fm amateur radio repeaters in any disaster area, to permit the full utilization of the capability of such repeaters during an emergency. Unless such repeaters are used daily or frequently, there is no assurance that they would be available and working when needed, or that competent operators would be available to operate them. It is recommended, therefore, that the RACES 2-meter segment be expanded from 146.79-147.33 MHz to 146.00-148.00 MHz. Also, the RACES pairs should be compatible with the voluntary plans already adopted by nearly all amateurs.

. . . 11. Proposed Section 97.163(b) defines a RACES station as being located at a "specific land location". It is assumed that this licensing permit does not preclude mobile portable operation if necessitated by the exigencies of an emergency situation. It is also assumed that the licensing point may be either in a private home or in a public location.

12. The League supports proposed Section 97.177, which would require a control operator of a RACES station to be a licensed amateur radio operator certified as enrolled in a civil defense organization. The League also supports proposed Section 97.179 which would provide that "[o]perator privileges in the Radio Amateur Civil Emergency Service are dependent upon, and identical to, those for the class of operator license held in the Amateur Radio Service." It is assumed that, when operating in RACES, the control operator must not only be a duly licensed amateur but also certified as enrolled in the civil defense entity conducting the operation, and that under such circumstances any third party may participate in RACES operation. This will permit larger RACES installations with multiple operating positions to train unlicensed "operators" but will not permit such persons to operate unless a civil defense registered control operator is present and continuously monitoring.

13. Proposed Section 97.191(b) would limit tests and drills to a total time not exceeding one hour per week. Many comments have indicated that one hour per week for tests and drills is not sufficient to maintain a constant state of readiness or conduct an effective training program, would eliminate participation in most civic events in which RACES organizations have been used in the past, and would in effect eliminate participation by RACES in the League's Annual Simulated Emergency Test. The Commission may therefore want to extend the time limit for this type of activity or to delete the last sentence of proposed Section 97.191(b). . . .

REPLY COMMENTS

. . . 1. Each of the many comments filed in response of the Notice of Proposed Rule Making has been carefully reviewed. They range from complete support of the Commission's proposal on the one extreme to continuation of RACES without change on the other extreme. Comment upon each

(Continued on page 160)

The June *QST* article, "Putting the G Line to Work," earned the Cover plaque award for author George Hatherell, K6LK, at right. Making the presentation are Forrest Barr, K6BV (left), and Los Angeles SCM E. H. Violino, W6INH.

COMMEMORATIVE STATIONS

The Commission in July proposed new rules (Docket 20111) under which commemorative stations would be issued licenses instead of "special temporary authorizations", which are granted at present to special-events stations. The text of the FCC Notice of Proposed Rulemaking appeared on page 97 of October *QST*.

Portions of the League's comments in this matter follow:

. . . 1. The Commission has invited comments upon a proposal which it has initiated to delineate clearly the provisions under which amateur operators may obtain a commemorative station license. A new class of amateur station license, commemorative station, would be created to be issued for any celebration that is unique, distinct, and of general interest to the public or to amateur operators.

2. The League generally supports the proposed changes in Sections 97.3, 97.40 and 97.51 which will accomplish the aim of the proposal. The limit to 30 days imposed in the headnote of Section 97.41(f) appears unnecessary in light of the fact that issuances of commemorative station licenses will all be on a case-by-case basis, and will ordinarily be issued for the duration of the special event. A celebration lasting more than the 30 days would automatically provide "extraordinary circumstances" and thus qualify for the exception. Celebrations of the type envisioned in this Notice generally run from a day to ten days as a usual maximum.

3. The League is much concerned about, and strongly opposes, the provisions of paragraph 5 of the Notice which would require the same fees for these short-term licenses as are required for full-privilege, five-year-term licenses. Reference is made to our filing in Docket 19658, wherein the League contends that fees should not be charged for amateur licenses under the Supreme Court guidelines of "value to the recipient." Nevertheless, beyond that contention, the purpose of the commemorative station is ". . . to bring public notice to the Amateur Radio Service by allowing an amateur station with a distinctive call sign to be operated at an event or celebration so as to help attract more contacts." As a voluntary activity of the licensee and of his associates, there is already sacrifice of personal time and of the cost of preparing the exhibit which accompanies most commemorative stations.

4. The proposed Section 97.41(f)(5) would require that the applicant state the "specific call sign requested, *if desired.*" (Emphasis supplied) In fact, the whole purpose of a commemorative station is to use a call sign which may be linked directly to the activity being commemorated. For example, WW4RDC was in use during the 1973 ARRL *Roanoke Division Convention*; KTØNEB and similar calls have been used from the *Nebraska* State Fair. To receive a "distinctive" call such as WW4ABC or KTØDEF for these stations would defeat the whole purpose of the commemorative station; therefore, an applicant always will specify a specific call sign desired. For the Commission to charge fees totalling $34.00 for the issuance of such call signs would deter many groups from applying, and would have the effect of discouraging, rather than encouraging, exhibits of amateur radio to the general public. . .

. . . 5. Except for the two provisions mentioned above, the League concurs in the objectives of the Notice, and urges its early adoption.

AUTOMATIC CONTROL OF REPEATERS

New rules were proposed by the Commission in July (Docket 20112, page 96, October *QST*) which would allow automatic control of repeaters under certain conditions. The League was consulted during the preparation of the Docket, and suggestions of its VHF Repeater Advisory Committee were also considered by the Commission. Extracts of the League's brief filing follow:

. . . 2. The League is pleased that authorized experiments in the area of automatic control have demonstrated the feasibility of employing remote control systems which are substantially as effective as local control, so far as compliance with the rules is concerned.

3. Inasmuch as the League's suggestions – including especially those of its voluntary VHF Repeater Advisory Committee – have already been taken into consideration in the proposal, we need simply urge the Commission to proceed forthwith to adopt this intermediate step along the road to reregulation of repeaters. In light of the amateurs' proven ability to cooperate with one another and with the Commission, reinforced by tests of individual repeaters under Special Temporary Authorizations, the proposed amendments to Sections 97.3, 97.79, 97.110, and 97.111 should be made effective as soon as possible. . . .

CROSSBANDING OF REPEATERS

In March, 1974, the League asked FCC to modify its rules so that repeaters could use an output frequency in a different frequency band than the input frequency (page 83, May, 1974, *QST*). In July the Commission responded with a Notice of Proposed Rulemaking, Docket 20113 (page 99, October *QST*).

Clubs come and go, have their ups and downs. So it's worth a celebration when you get to the forty-year mark still going strong! Here's the president of the Tri-County Radio Association of Plainfield, New Jersey, John Manna, WA2MTR (center), presenting a certificate to ARRL President Harry J. Dannals, W2TUK, at left, expressing the club's appreciation of the League during the anniversary banquet. Hudson Vice Director George Diehl, W2IHA, is seated at right. *(A WA2WDJ photo).*

In part, our comments say:

. . . 2. The League remains enthusiastically in favor of this change and urges its immediate adoption. In particular, we feel that the proposed revision will serve to increase activity in those frequency bands where there are now few repeater stations established. A sponsoring group can add facilities for operation on a new band to an existing repeater, and can permit communication between stations operating on the different bands where such intercommunication is now not possible. The increased flexibility thereby afforded should expand the public service capabilities of the amateur service by allowing the integration of stations equipped for different frequency bands into a single communications network during disasters and emergency drills.

3. However, the League feels that the proposed new Section 97.126 would serve no useful purpose. The present regulations, specifically Sections 97.3(i) and 97.40(e), adequately define the circumstances under which amateur stations established for the purpose of automatically retransmitting the radio signals of other amateur stations may be licensed. The proposed new section, in combination with the explanation of the term *automatic retransmit* contained in paragraph 7 of the Notice of Proposed Rule Making in this proceeding,[1] would have the undesirable and unnecessary affect of prohibiting the real-time retransmission of radio signals by an ordinary amateur station where such retransmission is but an incidental part of the station's operation.

4. Here are two examples of situations where it would be most undesirable to regard the real-time retransmissions of amateur signals as automatic, thus subjecting them to the special restrictions governing repeater and auxiliary link stations:

A. In order to provide communications following a major storm which has disrupted normal communications channels, amateur stations establish local networks on vhf and regional networks on hf to handle messages. Station A on an hf network has a message which Station B on a vhf network can deliver. Station C has the capability to operate simultaneously on both frequencies. Station C should be permitted to retransmit Station A on vhf in real-time in order to expedite the handling of the message.

B. Station D on the West Coast has good hf receiving capability and receives clear signals from the station at ARRL headquarters, W1AW. He should be permitted to retransmit W1AW on a local vhf network for the benefit of stations in his area lacking good hf receivers without going through the needless operation of transcribing the transmission on magnetic tape for later retransmission.

5. Permitting such retransmissions results in frequency utilization that is at least as efficient, and in many cases is more efficient, than prohibiting them. In short, retransmission which involves a manual operation by a control operator present at the location of the station transmitter, where such retransmission is not a primary purpose for which the station was established, should not be construed as automatic retransmission and should not be a prohibited practice in the amateur radio service.

6. In summary, the League urges the immediate modification of Section 97.111(c) as proposed, but sees no necessity for the proposed new Section 97.126 and urges that it not be adopted. . . .

[1] Part 97 of the Commission's Rules does not contain a definition of this term.

CB AMPLIFIERS TO BE OUTLAWED?

Power amplifiers have long been a major problem in the Citizens Radio Service. Though it has always been illegal to use powers in excess of 5 watts dc input, there has been no control over the importation, manufacture or sales of amplifiers capable of 50 to 200 times this power to people who will use them on the 27-MHz Citizens Band.

In July the Commission issued a Notice of Proposed Rulemaking, Docket 20118, intended to curtail the manufacture, importation or sales of amplifiers capable of being used in CB, and to make it *prima-facie* evidence of violation to have such a device at the station unless there is also a license issued to the same party in another radio service authorized that power.

The League supports the principle behind this docket wholeheartedly, but has had to file comments pointing out that the language proposed to be adopted by FCC would have inadvertently applied to at least one amateur equipment already on the market, and no doubt to other high efficiency units being designed. The comments also reiterate the desirability of other changes in the Citizens Radio Service rules proposed in the League comments in Docket 19759, the Class E CB matter.

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FCC has also altered its CB rules slightly to make it easier for voluntary, unincorporated associations to obtain and use CB licenses for the group's legitimate activities. Formerly, such organizations had to make a showing that its proposed operations could not be conducted under the individual licenses of its members in order to be eligible for a license in the group name. Under the organizational license, all participants become "units of the same station," have all channels available to

them, and are relieved of the five-minute restriction.

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Enforcement in the Citizens Radio Service has been streamlined, too, by combining a Notice of Apparent Liability for a fine with the Notice of violation. The new procedure will be used for failure to respond to official communications and cases where violations are regarded as willful – interstation use of intrastation frequencies, communications over 150 miles; failure to identify by callsign; use of a frequency not authorized for Class D Citizens radio stations; overheight antenna; and power in excess of 4 watts output. Thirty days will be allowed for response. The new procedure becomes effective January 6, 1975.

RULEMAKING REQUESTS, DENIAL

Donald W. Keith, WA4BDW, has requested rulemaking under which the FCC would resume supervision of examinations for Technician Class license by all applicants except those who would normally qualify for Conditional Class. RM-2443.

Paul Williams, W6WEQ, would have the Commission amend Section 97.7 (a) so that the privileges for Extra Class and Advanced Class would also be available to those who held General or higher class license on November 22, 1968 (the beginning date for the return to incentive licensing). RM-2449.

Robert E. Becker, M.D., W9EHR/7, asks for creation of a "CW QRP" license with a 5 wpm code test and a multiple-choice exam on regulations and operating practices; he believes it would be beneficial to older people who find the math needed for Novice a hurdle. RM-2463.

Those interested in any of these matters may register their opinions by writing promptly to FCC Amateur & Citizens Division, Washington DC 20554, mentioning the RM number and subject.

The Commission, by authority delegated to the Chief, Safety & Special Radio Services Bureau, denied RM-2111, a petition of "The International Amateur Radio Society," (one of the groups with which Clif Evans, K6BX, is active), which sought clarification of the eligibility of corporations and organizations to hold amateur station licenses.

WØ QSL BUREAU CHANGE

Reggie WØOYP and Ferne Hoare, who have been handling QSL chores on behalf of amateurs with WØ calls for about five years, now have to give it up effective January 1, 1975. On behalf of the League and the "customers," may we say "Hearty thanks and best wishes!"

Dr. Phillip D. Rowley, KØZFL, 5209 Loma Linda Road, Alamosa, CO 81101, has kindly consented to add the WØs to his present QSL duties for KØ, WAØ, WBØ and WNØ. So once again all Zeroes will be handled by the same bureau.

LEAGUE OPPOSES "HIRAN" ON 420 MHZ

FCC has issued a Notice of Proposed Rulemaking, Docket 20147, which would permit "temporary sharing on a non-interference basis" of the 420-450 MHz band by a non-government radiopositioning service using a form of SHORAN called HIRAN. Currently, U.S. rules permit only government radiopositioning (e.g., radar) as the primary service and amateur radio as the secondary service.

ARRL is strongly opposed to any such "sharing" seen as inherently unequal and harmful to the amateur service. Our comments follow:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of		
Amendments of Parts 2 and 91 of the Commission's Rules and Regulations to Permit Assignment of Frequencies in the 420-450 MHz Band for Non-Government Radiolocation	)	Docket 20147

To: The Commission

COMMENTS IN RESPONSE TO PROPOSED RULE MAKING

The American Radio Relay League, Incorporated, the national non-profit organization of amateur radio operators, respectfully submits the following comments in response to the Notice of Proposed Rule Making released on August 23, 1974.

1. In view of the rapidly-increasing occupancy of the 420-450 MHz band by amateur stations, the League must oppose the proposal to make this spectrum available to yet another non-amateur user service, even on a temporary basis. For many years, amateurs have coexisted with interference from Government radiolocation operations in this band. This interference has placed severe limitations on amateur experimentation with weak-signal techniques, especially on long over-the-horizon, earth-moon-earth (moonbounce), and satellite paths. Other uses which amateurs make of this spectrum for mobile, fixed, point-to-point, and wide-band television work have suffered some degradation as well.

(Continued on page 159)

Ham radio has been operated from many kinds of events – this one is the Bancroft "Rockhound Gemboree" with Ed Dunham, VE3AXR at the mike, hopeful Glen Faggeros looking intrigued, and Ron Bailey, VE3EEY, radiating amusement. Also helping – both to operate the HW-12 and in polishing rocks – was Doug Pitt, VE3DPP. *(Cyril Sharp photograph)*

IARU News

INTERNATIONAL AMATEUR RADIO UNION, THE GLOBAL FEDERATION OF NATIONAL NON-COMMERCIAL AMATEUR RADIO SOCIETIES FOR THE PROMOTION AND CO-ORDINATION OF TWO-WAY AMATEUR RADIO COMMUNICATION

WORLD AMATEUR CONVENTION PROPOSED

The Secretary-General of the International Telecommunication Union, M. Mili, has written to the member-societies of the IARU proposing that a World Radio Amateur Convention be held within the framework of "TELECOM 75" and the World Telecommunication Forum. These events are scheduled for October 1975 at the ITU's headquarters in Geneva. "TELECOM 75" is a world telecommunication exhibition; the Forum will include lectures given by the world's leading scientists, telecommunications decision makers from ITU member countries, and engineers from the world telecommunication and electronics industry. Mr. Mili observed in his letter to IARU societies:

In accordance with the wish of the IARC, and as patron of the International Amateur Radio Club, whose call sign 4U1ITU is well known by hams all over the world, I decided right from the beginning to give radio amateurs an opportunity to participate actively in "TELECOM 75." I hope to be able to welcome radio amateur delegations from all over the world, and should like a special section of the exhibition to be devoted to a round-the-clock operation by radio amateurs throughout the duration of the exhibition.

The weekend of October 4 and 5, 1975, has been reserved on the ITU schedule of events for the convention. In requesting world-wide publicity for this proposal, Mr. Mili said:

I am convinced that such a massive meeting of radio amateurs would be representative of the spirit of active international cooperation of the world radio amateur organizations. I hope that your organization will respond enthusiastically to this invitation. . . .

Although no further details for the proposed meeting are yet at hand, we expect to keep readers of these pages advised of Telecomm 75 plans as they develop, not only to demonstrate the cooperation which exists between ITU/IARU but also for the benefit of those North American amateurs who may wish to make plans for attending the exhibition.

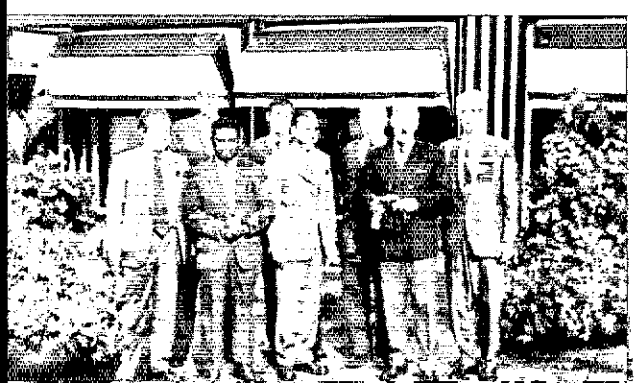
CANADA DROPS MEXICO FROM RECIPROCAL LIST

While there never has been a formal reciprocal operating agreement between the governments of Canada and Mexico, in the past it has been possible for Canadian amateurs temporarily resident in Mexico to obtain operating permission there. In view of this, the Canadian government similarly has been willing to grant operating permission to visiting Mexican amateurs.

Now the Canadian Department of External Affairs has been informed by the Mexican authorities that they do not wish to establish a formal

(Continued on page 88)

Left photo: The IARU Region I Division Executive Committee met in The Hague in October to make final plans for the triennial Region I Division Conference scheduled for Warsaw in April. The Committee hosted two visitors from the headquarters, IARU president VE3CJ and vice-president W4KFC. Shown here (l-r) are YU3AA, W4KFC, EL2BA, OH5NW, SP5FM, G2BVN, SM5ZD, and VE3CJ. Right photo: W5SKW (right) and his wife Rosie were honored during a visit to Luxembourg by a special meeting of the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes, R.L.* called in their honor. Vice-president LX1RK (center) presented them with a hand-painted ceramic plate and a certificate to commemorate their visit. In return, Rog was able to give each member of the society an honorary membership in the Amateur Radio Club of Southwest Louisiana. Such visits are perhaps the best evidence of the international good-will which can be created through amateur radio.



How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

W h e n :

There seems to be more than the usual soul-searching, inward-looking, graph analyses and transcendental meditation among the populace as we enter another new year. Problems cropping up in everyday life spill over into some aspects of amateur radio, naturally, even though by its very nature our game has always basically thrived during economic pauses. More people find more avocational time, fully appreciating a foil against increasing daily cares. Even at this sorry stage of the sunspot cycle there's nothing like a DX pileup or two to get your mind off the soaring food bill.

Yes, indeed, '75 promises to be a year for deep thinking and rethinking about where we are, where we were, where we're going, and that sort of thing. The Amateur Service will receive its due share of attention. We'd like to add this thought to the tank: It's vitally important that amateurs recognize ham radio's remaining exclusive prerogatives and properties, then to strengthen and protect them.

Yeah, just what's such a big deal about being a ham anymore? Not so long ago only radio amateurs were privileged to run radio stations in their own homes, cars, planes, boats, etc., purely for their own enjoyment. That biggie is no longer true. What's left, then, to make the passing of those challenging FCC exams worth the effort? We'd better check.

Generally speaking, hams still can legally build and experiment with the equipments used in their communications, employ freely a wide variety of authorized emission modes including skillful frequency-conserving radiotelegraphy, and communicate with each other regularly or at random throughout the world. Very attractive prerogatives, we think!

As to the properties, the intrinsics of the sport, we must identify and rally 'round the game's spirit and traditions . . . QSLs on the wall . . . those wild radio club auctions . . . regulation-abiding responsibilities . . . the junkbox . . . boiling the owl . . . Elmer & Co. . . . the dreaded Wouff Hong . . . rebuildings and trade-ins . . . cherished antique sets still going strong . . . Field Day and favorite League activities . . . net picnics . . . weird military surplus conversions . . . all the uniquely flavored angles that caught *your* fancy when first you were impelled to join the gang. Things little and big, intangible and tangible, which all taken together *are* amateur radio. Sure, they change over the years but may they collectively never QSB. When they do, so do we.

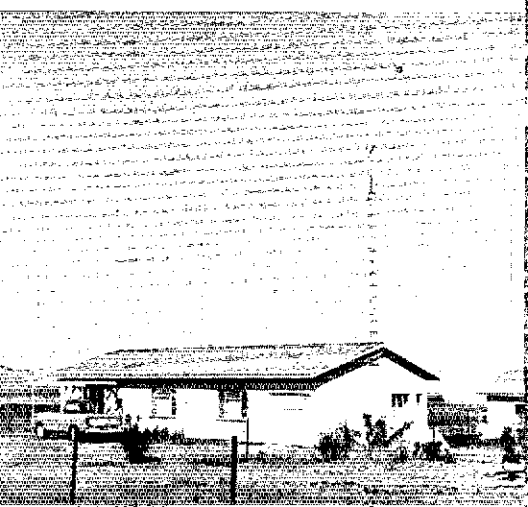
† † †

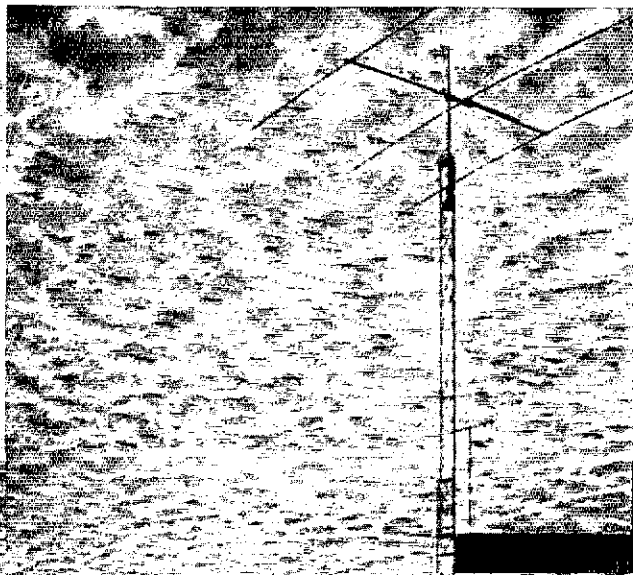
W h a t:

10 METERS, with a sunspot count almost out of sight, still surprises vigilant DXers with occasional solid openings. Will 28 MHz be productive right through a solar cycle minimum for the first time in ham history? Don't bet on this yet because we're still heading down, down, down, and a year from now may see the smoothed spot count only in the teens. Meanwhile let's grab what joys abound. "You will note that the Great Pumpkin flew earlier last fall," remarks 28-MHz cw enthusiast K4BZH. "That's why Linus missed him again,

*c/o ARRL, 225 Main St., Newington, CT 06111.

ZS3CJ'S spread on the severe African veldt is a QTH of the Month in contrast to the lush Curacao environment of PJ2VD. *(Photo via W4BRB)*





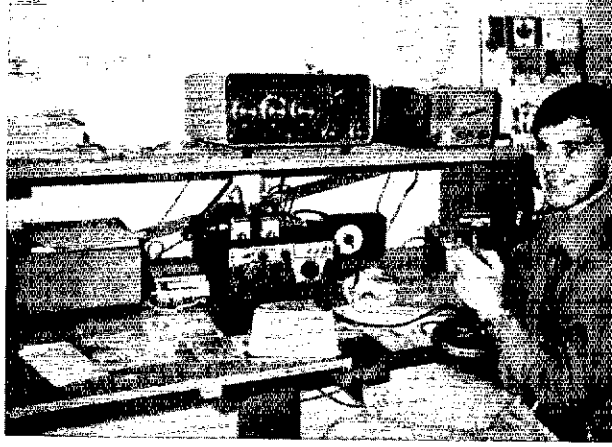
but the G.P.'s ionization trail brought fine 10-meter openings in all directions for my ninety-watt DX60 and long-wire." WA3SWP does well with his HT32, HQ170 and ground-plane with two radials, commenting, "I find it very easy to work DX on ten even at this low stage of the cycle." K2OVS says the band suddenly came to DX life in late August and, "By mid-October 28 MHz was alive in most directions." Other mail from W9LNQ, Ks 2YFE 3DE 5MHG, WAs 2EAH 3JJV 3SWF 4GAJ, WBs 2EOO 2MAN 4FDT 4ZVF 6OSS, G3RFG, I3FIN and the aft-mentioned literature of DX clubs and groups mention QSOs with the radiotelephones of As 2CCY 2CEO 4XFE 9XE, C3IGW, CEs 3AQB 3ARP 3EZ 3TV 4EM 5DZ, CN8s BC BO CQ, CPs 1AP 1DCC 3CN 5DK/HK3, CRs 4BS 6AG 6CN 6DS 6FW 6HI 6II 6JL 6LL 6NO 6QW 6SW 6WT 7BF 7FS 7TJ, CTs 2AE 2AK 2BG 2BN 3BD, CXs 5CB 6AM 7AQ 7BQ, EAs 2IN 6BJ 6BM 8IY 8JF 8JJ 9ET, EI9BC, EL2s AK FN, EP2TW, ET3DS, F6BJY, FG7XL, FH8CJ, FL8HM, FM7AQ, FO8CX, FP8CT, FR7AL, FY7s AN YM, G3s RUV TJW, GC3YIZ, GD3FXN, HCs 1CW 1JA 2YL, HH2WF, HI8s EJH FED LC XAW XBB, HKs 2IN 3CCJ 3CTJ 3DMH 3LT 5DH 0BKX, HV3SJ, HP1XIS, HZ1KE, Is 2PJA 3FIN, IH9AA, IS0XXD, JAs 1NEX 7COK 7EDG, JG1DUN, JHs 2LQS 2SIS/mm 3DPB, JYs 3ZH 9GR, KCs 4AAC 6HK, KGs 4DS 6JDB, KH6s AFS BZF IJ, KP4DEC, KS6DH, KV4s AD CI, KX6s DB GX, KZ5s IT NG PY, LUs 1FBK 3EJ 5HEQ 5MAY 6DEX 6DWZ 7DZ 7FAG 8FEU 8FT 9EHR 9ERS, M1C, OAs 2AG 4BR 4KF 4MZ 4SS 4US, OD5s FV HC HO IT, OEs 2EM/YK 3LI, OX3DL, P29EM, PA0IWH/S2, PJs 2RR 7ARI 8JT 9BB 9JR 9JT, PYs 1EMM 2DUK 6AKZ, PZ1DR, RA6 6HFA 0LAN 0LAU, RH8EAE, RI8IBU, RL7LAH, SV0WKK, TGs 4FS 9IN, TIs 1K 2AJF 2BEV 2NA 2WD,TJ1EZ, TR8s DG SS, TU2s DV EF, UD6DFD, UF6FBH, UG6AU, UH8BAX, UJ8JBK, UK8BAK, UL7YAB, UP2DM, UW0LE, VKs 2BX 4QM 6KW, VPs 1AJ 1FF 1SYL 2GBL 2KH 2LAW 2LI 2MDX 8HZ 8KF 9AD, VQ9s BP R, VR4AZ, VSs 5MC 6BL 6DO, VU2s DK GDG, WA6TLJ/HK6, WBs 2VUO/VQ9 4WLI/YV1, XE1s J LLS, YB0ABN, YN1s AA AZ DS FWN, YU2CDS, YVs 1AQE 4YC 5DLT 5EEB 6AW 7AJ, ZDs 3X 3Z 7FT 7HH 7PS 8MH 8RD, ZEs 1BF 1BP 1DG 4JW 6JW, ZK1DX, ZL1s AHV BEB GW, ZPs 5AL 5GP 9AH, ZSs 1OV 1WA 1XG 2EV 2GP 2IM 2L 3AW 3HT 5LV 5TV 5ZM 6AJL 6BJ 6Cs 6ZE, 3B8CV, 4U1ITU, 4W1AE, 4X4s KT TX, 4Z4s DC EU MJ MO, 5B4s BS CY, 5N2ESH, 5T5s CJ DY, 5U7s AG BA, 5V7WT, 5W1AL, 5X5NK, 5Z4PP, 6W8s DY FP, 6Y5s DE HM, 7Q7s DW RM, 8P6AD, 9G1AR, 9Hs 1BH 1BX 1C 1CG 1CW 4D 4G, 9J2s DT EP GJ WR, 9K2DC, 9L1s JM JT, 9M2DQ, 9V1RW, 9X5s PT VA, 9Y4s CR HM NP NT and WL. Downband you can shine up your cw on the radiotelegraphs of C3IGW, CP6FG, CO2BB, CRs 6AI 6AL 6OZ 7IZ, CT1VX, CXs 1AAC 3BH 4LO 7BBB, DJ2RC, DKs 1PG 4AZ 5CR 5UR, DLs 1CG 2AW 3GD/YV5 6GR 6MM 7BD 9UM, DM2BJR, EAs 2JP 4CR 7OH 8BK 8CS, EL2s AK DG, F6ABR, FK8s AT BV, FL8s CE HM, FO8DR, Gs 3AMR 3PTO 3RSF 3RZF 3UPY 4CEM 6JJ, HAs 1KVP 2SD 5KLL, HBs 9ACP 9AHA 9LO 0NL, HCIs CW JU KP, HGs 1KOA 4KYB 0KDA 0KLE, HI8LC, HS2AIG, Is 2CEX 2XKF 3FIN 3MFO 7LIT, ISs 1ATZ 1BDO 0FPH 0MTB 0PUD 0VDL, JAs 1AS 1AZR 1CNB 1JKG 1KRU 1MCU 1UII 2HNP 2OWQ 3CKR 3YBF 6BFQ 6PNA 7TJ, JH1s HDR QOJ, JR1SCZ, JY9GR, K4KQB/KS6, KG6AAY, KH6s AG COB HCM HIS HKM IJ RS, KL7GLL, KP4DJI, KA6AY, KS6DY, KZ5s BB EE, LAs 2MA/mm 7XQ, LUs 1DPR 2DEX 3DSI 3EX 6DKX 6EF 7DZ 9DJI, OA4s AHA QN, OE1TKW, OHs 2BAD 2FT/3 3SU, OX3WQ, PA0s BOE CVD DX JR YN, PJs 2PS 2VD 9JR 9JT, PY1s BYK HQ LW MB MCC, RI8IBU, RL7FCM, SMs 5DKJ 6CVT 6FAJ, SV1CH, TI2WX, TJ1EZ, TN8BI, UA0ZI, UB5s UAQ WBN, UH8HAI, UKs 8AID 0SAJ, UL7GAA, UM8MAK, UP2s PAP PBI PBZ, UV9DX, UWs 4AH 0LE, VKs 2DA 2EO 2QL 3RJ 9NP, VOs 1AW 2AG, VP2LAW, VR1AA, VS5MC, WB4KSE/KW6, WP4DSZ, XW8BP, YN1AA, YUs 1UM 3TZR/mm 4AAW, YV5s AIZ BHI KL, ZC4s BI CI, ZE1s AN BT EN, ZF1AL, ZLs 1AIZ 1BGT JAMO 1GX 1IL 2CD 3GQ, ZP5s EU VO, ZSs 2AG 5DE 6AL 6SS, 3A0GV, 3B8s DN MS, 3D2FO, 4U1ITU, 5B4AU, 5T5CJ, 5W1AR, 5Z4LW, 8P6s BU DW, 7Q7DW, 8R1J, 9H1s C CH, 9J2GE and 9Y4VU. You might get a conditions tip-off by checking beacons DL0s AR (29,000 kHz),IGI (28,195), GB3SX (28,185), VE3TEN (28,175), 3B8MS (28,190) and 5B4CY (28,180) although the sharp selectivity of 10-meter openings may still leave the band hot in some directions when no beacon signals are heard. Anyway, plenty of 5BDXCC credits are still collectible on 28 MHz. And are any Novices getting into the DX fun on our newest WN band?

† † †

Where:

NORTH AMERICA — To bring things up to date, I handle QSLing for CR6s GA XX, CT1s OF LN, JYs 1 2 1/b 3BZ 6AS 6RS 9AA 9AB, KSLTH/KH6/KM6, KC6BW, KH6HDB, M1B, SK6AW, 3A2CP and 7X2BK, also for QRT stations CE0AE (Fr. Dave only, June 27, 1970, to March 26, '71), CR5XX (March 10-15, 1972), SV0WI (August 10, 1968, to June 11, '70) and 5A3TX (1968-'70). Logs also are on hand for K7UNB/KM6 (March 18 to May 31, 1970) and KM6DU/KH6 (contest QSOs July 18-20, 1970). (WA3HUP) . . . CF CI and CY are Canadian prefix variations currently in vogue. CF3DTG is VE3DTG, etc. (WB2EOO) . . . So far I've confirmed 75 of my first hundred countries worked, about par for the course and they keep dribbling in. (K0CVD) . . . 'Alp! These italicized brethren seek suggestions toward securing affidavits from holdouts mentioned: (W1OPJ) HC2SB, PZ1BH; (K9UIY) KM6DJ '65, RAEM '61, TY1ABE '73, VK0JB '61, VP4WI '61, ZD9AC '65; (WB2EOO, then WN2EOO) CE5JQ, CT1UM, DL1RK/HB0 EI4A, FM7WB, FY7AO, HP1NU, IT9RAN, LA9JJ, LZ1KNB, OH0AL, TF3AW, VQ9R/f, W1TZI/HR6, XG1J, ZS1NS and 5Y4XBP. Any 'alpful 'ints? . . . This month's "QSLers of the Month" are nominated in *QST*'s DX mailbag by Ws IGNC 1OPJ 2ESX 3JZJ 4WFL, Ks 9UIY 0CVD, WAs 2PCF 3SWF 6GZG, WBs 2EOO 0KFY, WN1TFF and I3FIN, all for impressive rapidity in returns: CRs 6AI 7IZ, CTs 1UA 2BN, CX8BBH, DA1HP, DM2CYO, DU2EL, EI9BG, F0AHY/FC, FK8BV, FO8EG, HA5KFU, HC1PZ, HV3SJ, Ks

SV1BZ, among the more active proponents of the DX art in Athens, is widely worked on 20. *(Photo via SV1HX)*



ZP5GP makes Paraguay considerably easier to work while studying in Asuncion with missionary parents. Gary signs VE4IL back home. *(Photo via K9UIY)*

1ZES/HI8 9KGA/6W8, KV4AA, KZ5ZSN, LUs 1HDC 5HFI, OE6HZG, OKs 2DB 3TKM, ON5FC, OX3YY, PJ8WW, SM2AGD/HKØ, ST2AY, SVØWV, TI2WX, TR8SS, UA1OE, UK3AAC, VPs 2AR 2EEA 2LAW 2LBH 2MF 5GS 9HM, VS6BL, WA8TFJ/YV6, WB8BN/HC, ZD8MF, ZF1CQ, ZS3AW, 3AØGY, 4K1A, 5W1AL, 6W8EX, 7P8AY, 7X2SX, 9Ms 2DQ 8HG and 9V1OP, as well as QSL aides Ws 3HNK 4BRB 5UBW 6KNH, K3TUP, WA8TDY, WB2EZG, DJs 5IO and ØUP. Any additionals?

AFRICA Algeria announced shuffling of its call areas in October: 7X2, La Saoura; 7X3, Oasis; 7X4, Alger; 7X5, Oran; and 7X6, Constantine. (VERON) . . . Word from Libya supports the belief that no legitimate 5A activity has occurred since 1967. (WCDXB) . . . The genuine FRØBCS specifies no QSL arrangements with F2MO, and those 9J1Øs were 9J2s of the same suffixes doing a commemorative thing in October. (DXNS) . . . Efforts are still in progress to pry loose those FR7AM/g QSLs so long overdue. (WCDXB) . . . Instructions for QSLing TY1UW via ET3ZU are no longer valid since Aldo left Ethiopia in November. (LIDXA)

EUROPE — I hereby recommend SY5MA of Mount Athos as a 100-percent QSLer. I should know, because I was SY5MA. Replies to my cards world wide run a paltry 25 percent with W/Ks responding only 18 percent. Evidently the time has passed for reliable QSL exchange as an amateur radio tradition. (W3AG) . . . SVØWV says no packets from his local bureau for eighteen months. QSL direct only. (I3FIN) . . . Polish amateurs still switch to the SQ prefix now and then for commemorative purposes. SQ3GD is SP3GD, etc. (W2ESX) . . . DL7RT/HBØ QSLs went out via the DARC bureau pipeline last summer and should be reaching distant destinations about now. (DL7RT) . . . While going after DLD diplomas I received 506 QSLs from 510 DOK stations worked. Greetings on my QSLs in their language apparently were well appreciated because not a single self-addressed envelope or International Reply Coupon was used. (WB4MHK) . . . W3HNK states that the former SVØWEE, operator Floyd, receives his cards via other routes. (K9UIY)

OCEANIA — I became QSL manager for VK2BKE of Lord Howe Island as of October 1, 1974, requesting the customary self-addressed stamped envelopes or s.a.e. plus IRCs. (W9RKP) . . . Final shipments of KP6KR Kingman Reef pasteboards are scheduled via bureaus this month. (DXNS) . . . If anyone at the DX end needs a QSL tender I'm available. My task as KJ6DI's manager is just about completed. (W6JYT)

SOUTH AMERICA — I do ZP5GP's QSLing in response to the usual s.a.s.e. amenities. Please be accurate as to Greenwich Time and Date! (K9UIY) . . . I regret the delay in replying to cards already received but I'm slowly getting caught up after closing 9Y4MH for return to Canada. Those still requiring my Trinidad QSLs can reach me at my new Ontario address. (VE3MH) . . . Sure aggravated to see so many Venezuelans in the DX Century Club when none of the YVs I've worked comes through with a single card. (WA1RQT)

ASIA — Inquiries are welcomed re confirmation of my 1972-'73 contacts as HS3AJC, and '74 QSOs as portable-OA4. (WA5DXI) . . . I assumed EP2FR's QSL chores as of September 26, 1974. (W3YMB) . . . After thousands of contacts from KA6JA I've probably missed someone in the QSL department. Plenty of blanks are on hand; reapply to my new Utah QTH. (WBØJAI/7) . . . The following individual suggestions are not necessarily either accurate, complete or official. Might just work, though. . . .

A9XV, C/O Gulf Aviation LTD., P.O. Box 138, Bahrain
DL4SA, Box 70, APO, New York, NY 09008
EA9FA, Box 72, Ceuta, Spanish Africa
EP2SN, N. Styer, Box 200, ARMIS/MAAG, APO New York, NY, 09205 (or to WA3BZA)
HBØAWQ, Box 14949, Vaduz, Liechtenstein
HI8HA, H. Alvarez, P.O. Box 173, Santo Domingo, D.R.
HI8LAR, Box 404, Santo Domingo, D.R.
HI8MOG, P.O. Box 366, Santo Domingo, D.R.
HI8XKP, J. Gonzalez (KP4EAX), Box 2180, Santo Domingo, D.R. (or via WØGX)
JY9CR, Box 2788, Ahman, Jordan
K1ZES/HI8, L. Nathan, Dominican Telephone Co., P.O. Box 1377, Santo Domingo, D.R.
ex-KA6JA, J. Eckhoff, WBØJAI/7, 328 Vampire St., Hill AFB, UT 84406
LZ1XJ, P.O. Box 70, Haskovo, Bulgaria
OE2s EM/YK NWL/YK HZL/YK (via OEs 2SCL or 5CA)
OE5WSL/5B4 (to OE5WSL)
PJ2HA/KP4, H. Aaldrink, Box 4520, Ponce, Puerto Rico, 00731
S21s A JA KK KP (via JA2KLT)
SMØFXA/IC8, G. Hosinsky, via Fraita 4, P.O. Box 18, I-80071, Anacapri, Capri, Italy
SVØWEE, F. Spencer, Box 878, U.S. Air Stn., Iraklion, Crete, Greece
SVØWV, J. Doherty, P.O. Box 1, U.S. Embassy/KAV, APO, New York, NY 09253
UK1PAA (via CRC, attn. UW4AT)
VKs 3IA ØIA (to VE6CCJ)
VP2DB, G. Stedman, c/o DBGA, Hanover St., Roseau, Dominica, W.I.
VP2s E EEA (via W4GSM)
VP2EM, Box N3913, McPherson School, Anguilla, W.I.
VP2s GBS GMB MJK (via W5MYA)
VP2KK, P.O., Basseterre, St. Kitts, W.I.
VP2s MOT MSU (via WB5IZN)
VP7BC, West Palm Beach ARC, P.O. Box 6834, Sourhboro Stn., West Palm Beach, FL 33405
VP8NK, J. Wallace, Box 55, Port Stanley, Falkland Islands
W4EV/VP9, G. Devilbiss, Tudor Hills Lab., APO, New York, NY 09560
WA5DXI/OA4 (to WA5DXI)
WB4KSE/KW6 (via K2BT)
YA1ZWA/5U7 (via I1BAW)
YBØABS, Box 2351, Djakarta, Indonesia
YBØNQ/9, P.O. Box 2761, Djakarta, Indonesia
YV6YY, Box 73, Puerto Ordaz, Bolivar, Venezuela
ZF1JA, P.O. Box 293, Grand Cayman Islands

ZL1s AA/c AH/c BKL/c, P.O. Box 23-508, Papatoetoe E., Auckland, New Zealand
ZS3JAM, P.O. Box 296, Otjiwarongo, Southwest Africa (or via ZS3TP)
ZP5LQ, USAID Paraguay, APO, New York, NY 09881
3D2AZ, E. Southwick, Box 184, Suva, Fiji Islands
4Z4PX-W3TCV/4X (via WA3NOS or WB4FSV)
9M8HG, K. Gita, Kuching, Sarawak
9Y4MH, K. Jones, VE3MH, 36 Charkay St., Ottawa, Ontario, Canada, K2E 5N4

A7XA (via DJ9ZB)
CE2PT (via WØELT)
CE3DZT (via HC1JZ)
CEØZG (via CE2AA)
CR6SN (via WØGX)
CV4C (via RCU)
DK5OS/IS (to DK5OS)
EA3URE (via URE)
EP2FR (via W3YMB)
FPØKE (via WA1QBH)
FY7AU (via WB4VUP)
G5RV/CT1 (to G5RV)
GC5AEG (to DJ9NX)
HC1EE (via WA8TDY)
HL9KP (to WAØVYZ)
HL9UB (via W7ISG)
HS3AJC (to WA5DXI)
HS4AFD (via DJ8KS)
IH9LAW (to IT9RAN)
IZ2ZGP (via I2YDX)
K6WR/ON (via W6ZM)
KG4DS (via WB8LUI)
KX6ZZ (via VE3GUS)
OX3CS (via EDR)
PA9WRR (via W6ZM)
PJ9JR (via W2GHK)
PJ9RT (via WA3IAQ)
SY5MA (see text)
TA1MB (via DK3GL)
TI1K (via RCCR)
VK2BKE (via W9RKP)
VK9RA (via VK6RU)
VP1FF (via WØELT)
VP2DA (via WA1ABV)
VP2EY (via W3HNK)
VP2GTE (via W5TMN)
VP2KJ (via WB2TSL)
VP5BC (to W4HAW)
VP5WS (via W4SME)
VS9FBS (via G3GKD)
XW8HJ (via K3SWZ)
ZF1AG (to K8SWW)
ZF1SV (to K6SVL)
ZF1WM (to W8JUY)
ZP5GP (via K9UIY)
3AØBA (via DL8FT)
3D2DD (via VE3GUS)
4M6AW (to YV6AW)
5G5A (via HA5KDQ)
5T5AC (via W1YRC)
5V7WT (via F9GL)
5W1AV (to W6KNC)
5Z4OS (via PAØPMP)
7Q7RB (via RSGB)
9H1BX (via RSGB)
9J1ØBO (see text)

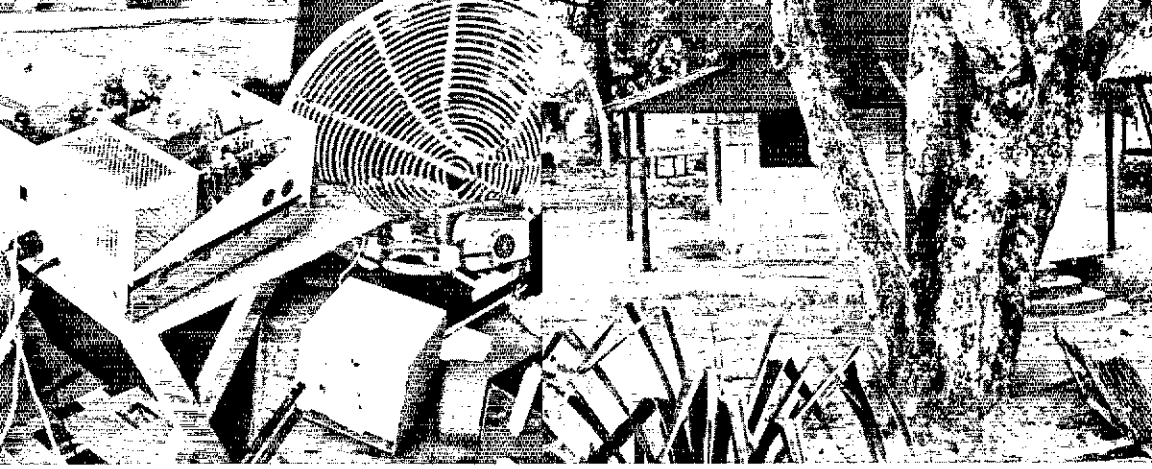
The preceding catalog comes to you courtesy Ws 1OPJ 2ESX 4WFL 6NLG, Ks 2OVS 9UIY ØCVD, WAs 1STN 1STO 3GBU 6DEN, WBs 2EOO 4FSV. Is 2CBM 3FIN. Columbus Amateur Radio Association *CARAscope* (W8ZCQ), *DX News-Sheet* (G. Watts, 62 Bellmore Rd., Norwich, N.72T England), International Short Wave League *Monitor* (E. Chilvers, 1 Grove Rd., Lydney, Glos., GL15 5JE, England), Long Island DX Association *DX Bulletin* (K2KGB), Neward News Radio Club *Bulletin* (M. Witkowski, Rt. 5, Box 167, Stevens Point, WI 54481), Northern California DX Club *DXer* (Box 608, Menlo Park, CA 94025), Southern California DX Club *Bulletin* (W6EJJ), VERON's *DXpress* (PAØs INA TO), West Coast *DX Bulletin* (WA6AUD) and Western Washington DX Club *Totem Tabloid* (WA7JCB). Your turn?

† † †

Whence:

EUROPE — The Fifteenth Scandinavian Activity Contest's results issued by Denmark's NRRL, '73 sponsor, list Ws 1PL ØIUB, K1GUD, Ws 4HOS SQQQ/7 ØMHK, WB2ZWJ, WA2DLV, K6ILB/7, Ws 3ARK 8GOC, WB6PZW, W6s KYA DGH and WB8NTY in order of U.S.A. cw score, VEs 2WA 5RA 3GCO ICE 3BR and 3BFK for Canada. Telegraphic toppers in other reporting countries, all single-operator data, include CR7IZ, CT1EU, DJ8IZ, DM3YBF, EA2IA, EI7CC, F8OP, G3RZI, GM3PFQ, GW3INW, HA5KF, HB9PQ, HI8LPN, IT9AF, JA1s ILN OMH, LU1DPR, LZ1LI, OD5LX, OK3CCK, PAØVO, PY1DBU, PZ1CQ, SP5EXA, UAs 2DP 9JH, UB5MZ, UC20AA, UD6AM, UF6QAC, UG6JJ, UH8BO, UI8LAE, UL7NG, UO5AP, UP2DV, UQ2GDW, UR2QD, VS6AW, YB3CW, YO2ARV, YU1SE and 9M2CX. The big cw ten in scandinavia are OH8RC, OZ1LO, SM2EKM, OHs 3YI, 1PS, SM5CBN, LA5UE, SM5CMP, OH7RF and OY5NS in that sequence. On the phone front for our side in scoring order go W4WSF, K9ECE, W6DGH, Ks 6SVL 1OME 4HGG, Ws 2FCR and 6KYA with VE2AFC the lone Canadian entry. Mike leaders in other lands: CR7IZ, CT1DW, DK9FE, DM3OML, EAs 5BS 6CK 8GK, EI7CC, F6AJA, G4ALG, GC3YIZ, HA3ME, DL3ME/HBØ, I2PTQ, JA6YAP, LU5HFI, LZ2EE, OD5BA, OK1MPP, ON5GQ, PAØVO, PY4KL, SP6FSH, UA4NAK, UC2OAA, UD6DER, UF6HS, UG6JJ, UH8BO, UL7IAF, UO5OAB, UP2NX, UQ2DV, UR2QD, UW9WB, UY5CQ, YO5TP, YU1SJ, YV5DLH, 9H4G ANd 9M2CJ. Scandinavia's top voice ten rank OH2BM, OZ5KF, OH3YL, SM2EKM, OH1VR/8, SM5s AD CEU CSS, OHs 1LW and 5WH. Denmark's EDR society sponsored the '74 SAC and SRAL of Finland will do the honors this year, alwyas on the third and fourth weekends in September. (LA5QK) . . . Can't work cw because of a physical handicap but I look for the W/K/VE gang on voice from Vallingby with a Drake lineup. (SMØGKF) . . . G4BJM and I pushed 3AØGY to 700 QSOs in September but poor conditions almost shut out the Americas. We hope to return to Monaco this year, also possibly GC- and GD-land. (WB2EZG) . . . I whistled CQ on a crowded Copenhagen bus last summer and raised OZ6AX up front. (WB2HTJ) . . . Enjoyed the DX end as FØACO and G5BAT in September. (K1IXG) . . . I attended NRRL's national convention at Brumendal in August, meeting many LAs I had QSOd over the years. Hams visiting Scandinavia should visit the independent radio state of Morokulien on the main road between Kongsvinger and Avrika, where your amateur license will authorize you to work DX from LG5LG-SK9WL. (WA1LBP) . . . QSOs with I5ØRAI and three IZ-prefixed stations in different Italian call areas during October qualify non-European stations for a special certification issued by the RAI group, P.O. Box 6250, Rome. (10s AG APV HY) . . . I'm settled down in the U.K. now quietly working toward DXCC. For some reason it was much easier when I was signing VQs 4IQ 8CR, 5Z4IQ and 3B8CR! (G3LCJ) . . . REF's *Diplome des Nations Francophones*, recently added here, is beautiful wallpaper. (W4FWL/1) . . . K6WR will try DX life as PA9WRR in Amsterdan for the next tew years. (WCDXB) . . . Student LA7SP, now operating LA1K, finds philetaly a fine companion hobby to DXing. (K9UIY) . . . On the day I received October *QST* and saw HA5DJ's photo in "How's" I had the pleasure of QSOing him on 15 cw. (WA9MZS) . . . WA2AMY, operating SVØWJJ, says local QRM is fierce from five other SVQs in the neighborhood. (K2SJN) . . . Notes from this Yank DXer in Italy: MIC needs only fifty countries on 28 MHz to wrap up 5BDXCC. Tony's favorite hangout lately is on cw near 7045 kHz. Our own 13FIN DX total reached 174. Who needs QRO? ZL1BED and ZF1ST (W1CER of ARRL) plow into Europe with one and ten watts respectively. The ZL feeds a TH6DXX, however. I've been observing at close hand the operation of such highly competent Italian DXers as Is 3ASE 4FTU 6BQI and ØMYP to name just a few. Say, wonder how many overseas DX chasers like me need only Wyoming for WAS. C'mon you cowboys! (W3JZI-I3FIN) . . . I look forward to chats with old 14-MHz ssb friends from Frankfurt as DA2LC. (WA1PWY) . . . After starting out with a DLD-100 sheepskin in 1970 I've finally hit DLD-500, all cw on 10, 15 and 20. Real fun project for an old-timer first licensed in 1912. (WB4MHK) . . . UKØBAE operator Victor says the Cape Chelyuskin station is the Russian mainland's most northern ham installation. (W2ESX)

SOUTH AMERICA — The gang may remember me as CX5AH before I moved to a new missionary post in Brazil last June. I use an FTdx400, SB200, 15/20-meter rotary and a dipole for 7 MHz. The skyhooks are atop a three-floor apartment building in the very intriguing city of Florianopolis. (PY5ZAF-WA8OVC) . . . KC4USN surprised our 7275-kHz Corncob net with good signals around noon GMT. The operator said he would soon be signing KC4AAA. (W1CFZ) . . . KC4USN shows on 14,270 kHz at 0845 GMT on



VQ9D/d's recent eruption from rare and remote Desroches Isle, courtesy VQ9s BP D DC and M, occurred amid this intriguing scenery in September. Transportation problems, hairy weather, equipment failures, punk propagation and other DXpeditionary obstacles failed to prevent an imposing collection of world-wide QSOs.

occasion, KC4AAC skeds a W9 on Mondays, Wednesdays and Fridays near 21,277 kHz at 1630, and ZS1ANT puts in 14,208- or 21,295-kHz appearances from Sanae base at 1600-1800 GMT. (VERON) . . . KC4AAC's Anvers isle QTH is about 700 miles south of Cape Horn at 54°S and 64°W. (WCDXB) . . . VP8NU's 45-watter and long-wire shook me up with an answer to my 14,062-kHz CQ in September. He's in Port Stanley. (W1GNC) . . . Our society VERONA now counts about three dozen licensed PJ members. (PJ2HR) . . . YV1ACC guns for SSTV contacts daily at 1130-1200 GMT on or near 14,230 kHz with Robot, FR4C, SB220 and a 204BA. (VERON) . . . VP8MS may include South Georgia and South Shetlands on return southward but South Sandwich continues unlikely. (WCDXB) . . . Also active in the far, far south near 21,300 kHz is Adelie Land's FB8YF. (I2CBM) . . . WB4NCT/CEØZ, anchored with the Navy just offshore in October was so near and yet so far from Juan Fernandez isle. (LIDXA) . . . ON4AXA/mm inhabits a raft en route Trinidad from Morocco, plus or minus 14,200 kHz at 1200-1600 GMT. What a way to go! LAs 3CC and5DQ, probably signing the 3Y prefix, may radioactivate frigid Ellsworth Land for a spell. (DXNS)

AFRICA — SM2AGD's next government mission may take him to Western and Central Africa where he yearns for a crack at Annobon, Guinea and C.A.R. QSOs. 5Z4PI runs his own field days on DX bands from a Land Rover's 12 volts plus dipole. (WCDXB) . . . 7P8s AQ AT and AY make Lesotho no problem on 15 and 20 sideband. (VERON) . . . CN8CC knocks off for F6CVE after six Mohammedia months with a TS801 and 12AVQ. Serge's cw signal was very consistent in my area. 6W8EX is surprisingly big from Ziguinchor on cw with a mere 45 watts and ground-plane. (K9UIY) . . . Transportation uncertainty and the need for polar survival equipment frustrate the Bouvet plans of DJØYL, DL7s JP SU and myself. Meanwhile by Easter I hope to be heard from Monaco and/or Tunisia. (DL7RT) . . . 5T5AC was none other than XV5AC's Chester, W4EVG, on the African prowl for a change. (LIDXA) . . . FR7ZL/j splits from Juan da Nova at any time after months of 20-meter fun. (DXNS) . . . What a return trip from Desroches and VQ9D/d! The rough high seas made us glad to debark September 21st all bleary-eyed, wet and weary, but ready for another DXpedition. (VQ9DC)

OCEANIA — "Prince Leonard George Casley told two amateur radio operators that he, his wife, children and grand-children seceded from Australia with 18,500 acres in 1970," goes an item in the Los Angeles *Valley News*. "They call their new country Hutt River Province, but the Australian government refuses to officially acknowledge it." A new uncountry? (W6GQD, K6TXW) . . . VE6CCJ, formerly VKs 3IA and ØIA, now enjoys the sport from Calgary. (KU9IY) . . . ZM7AH lingered long enough to sop up much DX demand for the Tokelaus from 10 through 160 meters. YL ZL1s ALE and BKL may hit the Kermedecs this month or next after their successful Chathams sortie, and according to the vine some VK6 may make it to Heard Island one day soon. (WCDXB) . . . VK3s KS and XB, long a global favorite among XYL-OM DX teams, were guests at a lively fall meeting. (SCDXC) . . . VE3EZM's Pacific swing, already productive as KX6ZZ, VR4AZ and 3D2DD, takes him on a thorough tour of New Zealand and Australia this month. (VERON)

NORTH AMERICA — FB on the October 160-meter commentary but you left out a stalwart Utah 1.8-MHz man, Me. I've got 25 countries on that band, have worked the east coast on half a watt, and Eights with as little as 0.02 watt. My big 200-watter is homebrew circa 1942, and the skywires include a thousand-footer. Strictly cw here, and when 160 is slow I look around for the other ten states I need Oscar-style. (W7ZC) . . . For your collection of oddball QSLs how about such late-40's ham calls as XAZO, Italy? (PAØKZ) . . . Hey, anyone can be a winner in a contest if he picks the right QTH. I was the only Grand Caymans entry in the League's 10-meter Test! (K8SWW) . . . Fifteen had another hot spell in early October while I was operating WA9QQM, our school station. Worked three dozen Europeans and other goodies. (WB9LXK) . . . Say, doesn't anybody work cw out of Dominica anymore? (K9UIY) . . . After 41 years of hamming I'm retired from work and really appreciating DX. (W6JYT) . . . Preliminary indications are that the current 1974-'75 160-meter DX season could be DXcellent. (W1BB) . . . WØs AW and NUH take office as new Twin-City DX Association president and secretary-treasurer. There was a club presentation of the first Minnesota ARRL Five-Band DX Century Club membership plaque (No. 338) to WØGYH. (WØTRF) . . . I'm sampling DX from warmer and sunnier Florida after years as W8EBJ in Cleveland. (W4ZVV). QST

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* W3WRE

VQ9DC/D — DXpedition

VQ9DC has achieved double "firsts" – the first and only YL in Seychelles, and also the first and only YL to operate from Desroches Islands when her dream of going on a DXpedition came true in September. Diane writes:

"Top priority was the antenna sites and the men – VQ9BP, VQ9D, VQ9M – got to work immediately. I can assure you they come down a lot quicker than they go up. It was something to see us vainly trying to avert a minor tragedy as the first TH3 toppled over almost on top of Dick, VQ9D, and me, while Bill, VQ9BP, and Ron, VQ9M hung onto the guy lines. It hit the side of a copra shed and the resulting beautiful right angle may have improved its performance for it worked beautifully. They fired up my rig and stood aside for me to make the first contact of the trip with 5Z4NH, and it made our day as well as his. We closed down and worked on the remaining antennas and stores until we all dropped from sheer exhaustion and hunger. Fifteen hours on the high seas with mal-de-mer, very little sleep or food had taken its toll.

"Next day, completely refreshed, we took on all comers, and it seemed like the whole world was there. We had excellent conditions until the contest weekend. Conditions then deteriorated, but we struggled on taking advantage of every possible minute band opening. I was impressed by the operating of the calling stations who were courteous, standing by when requested, and taking their turn in the pileups. By the fourth night my rig developed problems, so with 60 countries to my credit, I worked as second operator on the other rigs, finishing with 75 countries worked.

"I was delighted to be called by DJØEK, Paula, and find that it was YL Howdy Days, and was able to work Bibi, LA5IS, and her OM, WA9TVM, Betty, and many others to give points. It was a pleasure to work many YL friends. There are, of course, too many calls to mention and all contacts will be receiving a card; we are waiting for them from the printer now.

"Highlights of the trip were innumerable, Ron proving he was as good catching a lobster as he is on cw. Dick as official photographer, and Bill as interpreter in Creole, as well as maintenance man filling generators as we ran out of gas in the middle of the night.

"The trip home was marked by very high seas and 30 knot winds and we were a bleary-eyed crew when we arrived in Mahe. It was worth it.

"Our combined thanks to everyone with whom we had the pleasure of a contact, and whose interest made us all anxious to try again."

* YL Editor, *QST*. Please send all news notes to W3WRE's home address: 305 N. Llanwellyn Ave., Glenolden, PA 19036.

Diane Cardell, VQ9DC, first YL to operate from Desroches.

1975 YLRL Official Changes

Jackie van de Kamp, W6YKU, has been appointed to fill the office of YLRL Receiving Treasurer for the year 1975, replacing Marion Bees, W8UAP, who has resigned because of ill health. Jackie will fill the office in an interim capacity during the coming year until YLRL elections in August. It has been requested that all dues, and membership applications be forwarded to Jackie van de Kamp, W6YKU, Nimshew Stage Route, Box 86, Chico, CA 95926.

1974 YL Howdy Days Results

The 1974 YLRL Howdy Days results show an increase of DX YL interest in this most informal of all contests that takes the form of a QSO party each September. The YLRL members who submitted logs are: DJ5UAC, 38 (points); DJ1TE, 35; W2GLB, 31; DJØEK, 29; WA8EBS, 20; K6KCI, 18;

WØZWL, Martha Shirley, new custodian of the reactivated Grandmothers' Club Certificate Award.

W2EEO, 10. Non YLRL member with the highest points was DJØYL. The non YLRL member submitting the log with the highest number of contacts is awarded a one-year club membership. There was no log submitted from a Novice Class YL.

Grandmothers' Club Award Reactivated

The Grandmothers' Club Award is being reactivated in memory of Mary Meyers, W9RUJ, originator of this certificate, now a "Silent Key." This certificate will be issued automatically to all licensed YLs who are Grandmothers, and Great Grandmothers if they register with the custodian before February 1, 1975. Registration after this deadline must be made within the certificate rules.

After February 1, 1975 the certificate will be available under the following rules: All licensed amateur radio operators are eligible. Work 25 members of the club obtaining the name, call, address, and membership number on her certificate. Name, call and address of person requesting the certificate. Gold Stickers will be awarded for proof of contact with 25 Grandmothers; also it will be awarded for proof of contact with 15 Great Grandmothers. Enclose s.a.s.e. for endorsement stickers, one dollar for the certificate.

Those already in possession of an award issued by W9RUJ, are automatically members; however, due to loss of the records it has been requested that all who have received the award send name, call, address, and award number to the custodian. Certificate custodian is Martha J. Shirley, WØZWL, 2430½ Canyon Lake Drive, Rapid City, SD 57701.

YL Elected to Five Star Operators Club

Florence Majerus, W7QYA has been elected to membership of the Five Star Operators Club, a group of amateur radio operators who communicate with the International code using keyboard operation. Flo qualified during a contact with WA7LRU at a speed of 82 wpm. Membership in this group of operators is based on exceptional ability, spacing, and accuracy in sending, as well as a mastery of the code in order to be able to communicate at these high speeds. W7QYA is the first YL who has qualified using this type of operation.

Canadian YLs Honored

VE3EUV, Doree Pettifer, Dot Abel, VE3DXZ, and Cathy Hrishenko, VE3GJH, have been selected to receive the Jim Jarvie Award of the Metro Club. This service award presentation was made at a special meeting at Warriors Hall in Sunnybrook for "recognition of outstanding service, and devotion to the principles of amateur radio." All three YLs are members of the Ontario Trilliums, and of Canada's national YL club CLARA. Both YL groups have assistance to handicapped amateurs as a major activity.

WØZWL, Martha Shirley

The Stratosphere Flights of 1934-35 sparked Martha's interest in amateur radio, and through the help of W2LV, Bob Morris, who was stationed at the Strato Bowl, she became W9ZWL, later WØZWL when her area became a part of the 10th call area.

Before World War Two, Martha was active with cw, and traffic nets. In 1940 she built a transmitter for her ARRL Division Convention to demonstrate that YLs could, and did build equipment. During this Convention she was the first YL of her Division to take part in the ROWH ceremony. She also has the special distinction of being the second YL to contact KC4USA when that station held a "YLs Only" contest from Antarctica in 1941.

During World War Two, Martha was Civilian-in-Charge of the message center for 17th Bomb Wing Headquarters at Camp Rapid, and trained the men in teletype procedure. Active in the South Dakota Morning Weather Net, YLRL, and ARRL, she holds six ARRL Public Service Awards, 1956 Edison Award Special Citation, the Wescent Medal, and was one of the first YLs to be elected ARRL Vice Director in 1960 in the Dakota Division. She is now custodian of the Grandmothers' Club Certificate. QST

Darleen Magen, HC2YL, with Carlos, TI2CAP, left, and Fernando, TI2FCD.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

BRIEF DISCUSSION under the heading, "Sunspots and Vhf Propagation," in the November *QST* column and more detailed description of methods and objectives in last month's lead material have generated more than a little interest, and numerous requests for more information. Since last September the writer has intensified both visual observation of the sun and monitoring of propagation information available from WWV. This was combined with a close watch on the amateur frequencies above 28 MHz. There has been something of a tendency for the tail to wag the dog here, and observing has admittedly cut into an already rather limited operating schedule, but results have made the time seem well spent.

The project became more interesting and productive as a result of a new propagation-information format in WWV broadcasts at 14 minutes past each hour. In addition to the usual statements about propagation quality, there is now very recent information about the state of the earth's magnetic field (quiet, unsettled, active), the magnetic K-index (numbers 1 to 10), and the solar flux. Of perhaps greater interest, the latter two numbers are stated with the expected direction of movement, such as "tending to increase slightly," "tending to remain constant," or "tending to decrease." In potential usefulness to propagation-minded amateurs, the addition of *trend* information is much like the greater usefulness of weather broadcasts when the direction of change of temperature or barometric pressure is given. At the very least, the new data should be more useful in interpreting the significance of solar observations made with simple backyard methods such as described last month, and pictured herewith.

Means for making long-term propagation forecasts have been available to anyone since shortly after World War II, when methods developed for military communications planning were declassified. There is also nothing new about using 27-day recurrence trends, though not many amateurs seem to use this simple tool. Regular observation of the sun, even by our simple methods, helps to supplement both the above aids, but there can be conditions on the sun that are not visible with simple equipment. This is where the new WWV format represents a marked improvement over information formerly transmitted. The solar flux and A index given at 18 minutes past the hour are always at least one day old. At the end of the period before they are changed, they are over two days old. Some solar-induced propagation events give very little warning. They are not called "sudden commencements" for nothing. The new WWV information format at 14-minutes-after could be one more link in the chain of information to be used in anticipating propagation vagaries associated with these often unpredictable solar events.

50-MHz news is mainly concerned with aurora and sporadic-E. It seems that the "summer" sporadic-*E* season never ended in 1974. Openings kept dribbling on through September, October, and November. Now we're into the shorter winter E_s season, with everyone pulling for it to last at least through the VHF Sweepstakes weekend, January 4-5.

Several contributors have mentioned the coincidence between fall E_s on 6 and the presence of disturbed conditions on the hf bands. W5SFW, Amarillo, Texas, says that when WWV is transmitting propagation quality figures beginning with W or U, in the cooler months, 50-MHz E_s skip is likely, usually in the early evening, local time. Just the reverse seems to apply in the summer skip season, with sporadic-*E* skip on 6 mainly during quiet geomagnetic-field conditions. Phil made this point during a 10-meter chat Sunday afternoon, Nov. 24. WWV was sending "unsettled" then, and sure enough there was a burst of E_s activity on both 10 and 6 less than two hours after the *F*-layer propagation dropped out on 10.

K7ICW, Las Vegas, observed seven different E_s openings during October, mostly to the W5s, especially along the "E_s pipeline to South Texas." Simultaneous observation of the hf bands indicates solar-flare influence, Al says.

The phenomenal amount of 50-MHz skip propagation observed by WA5IYX, San Antonio, includes a great deal of this sort of thing, with the open paths largely confined to the lower latitudes. Pat is ideally situated, far enough to the south to see more skip than other areas, and geographically "in the middle," so as to catch openings from both east and west. He is in the TE propagation belt, for openings to Central and South America, and most of the major 50-MHz population centers in this country are within normal single-hop range. He makes the most of it, grinding out pages of DX observations in the vhf range, month after month. Pat's October summary shows 18 separate 50-MHz openings on 10 different days. The total time the band was open was approximately 10 percent greater than any previous October since the records were started, the best previous being 1965. There was evidence of *F*-layer propagation on two days. Early November showed little E_s activity, but Nov. 16-17-18 could make the month balance out as exceptional.

San Antonio is SMIRK (Six-Meter International Radio Klub) headquarters, appropriately enough.

* Send reports and correspondence to ARRL, 225 Main St., Newington, CT 06111.

W1HDQ and W1SL look for sunspots with a simple projection system. The baffle at the top end of the small telescope provides a shaded area for viewing the sun's image (light circle) on the projection surface. Sunspots large enough to indicate likelihood of auroras and other propagation anomalies are easily seen with such projection viewing.

The regular Sunday night SMIRK Net (0200 UT, 50.2 MHz, W5QDB NCS) turned out to be a genuine international roundup on Sunday, Nov. 17. TI2NA, San Jose, Costa Rica, was in for about two hours, beginning about 2300 UT, working W5QDB, K5ZMS, WA5IYX, K5OOJ, and WA5CBT. After TI2NA faded out, 4s in Florida, Georgia and the Carolinas took over for about a half hour. Then the opening swung north and northeast, with WA9HPV, W1HDQ, W1WHL, WA1LBK, K1BXC, WB9HIC, WA4SBY, KØPWR, and WA9RDF worked in about 15 minutes. (The W1s are in that in-between distance, 1600 to 1700 miles, which tends to be rather rarely worked on 6, at least from this northern-end viewpoint.)

By this time the SMIRK Net was due for call-up, so W5QDB moved to 50.2 and gave it a try. But the 6-meter fraternity, SMIRK members or not, were not to be denied, so Tex finally just tried to see how many callers he could check in before the band went dead. Taking them by call areas, in true DX fashion, W5QDB managed to acknowledge 73 different stations in the next three hours. They included four 1s, two 2s, four 3s, fourteen 4s, seven 5s, one 6, one 7 (WA7KMY, Laramie, Wyoming), sixteen 8s, fifteen 9s, and eight Øs – all call areas and about 25 states. November a *low* month for sporadic *E*?

In this connection, our WWV monitoring shows minor geomagnetic storms in progress, and "active" or "unsettled" geomagnetic field conditions mentioned at some time during at least 20 of the first 24 days of November. This is the *bottom* of a sunspot cycle? It would seem from all the above that neither E_s seasons or solar activity cycles should be too seriously, as far as the possibilities for interesting vhf propagation are concerned!

Aurora was observed on 6 by K7ZCB, Boring, Oregon, on Oct. 12, 13, 16, and *E*-type openings on the 13th and 28th. The last was exceptional, in that it included double hop to the 4th call area.

WAØMRH, Omaha, Nebraska, reports E_s to San Antonio, Oct. 8, 0015 to 0145 UT; medium-strength aurora to Wisconsin, Minnesota, and Michigan, 0100 to 0330 Oct. 12; E_s to Nevada and California Oct. 15, 0345 to 0430; a moderate *E* opening to Florida, Louisiana, and Texas, with a few 7s at the end, Oct. 27, 0000 to 0210; a good opening to Arizona, New Mexico, and California Oct. 29, 0100 to 0430; *E* to New York and Connecticut, 0020 to 0215 Nov. 10; a fair aurora beginning at 0100 Nov. 12, mainly to other Øs. This went out at 0210, but was back at 0630, to New York, holding in to 0730. Like 50-MHz observers elsewhere, WAØMRH found Nov. 18 exceptional. From about 0120 there were signals from North Carolina, Florida, Louisiana, Mississippi, Alabama, Texas, and Arizona, in that order, to 0456. WWV information for that date: geomagnetic field unsettled. The more detailed format mentioned in our lead paragraphs started a few days later.

Our final 6-meter report is from Hiro Ebihara, JA1LZK. Hiro says that there were "several VK and KG6 openings" in the fall DX season, but he did not give dates, except for Oct. 14. On that day, a Japanese amateur near Tokyo, who cannot understand English readily, heard conversation in that language between 50.1 and 50.15, 2200 to 2400 UT. The frequency rules out the VKs, who operate above 52 MHz only. JA7SDU has heard a C21 (Nauru), but the call was not copied, and it is not known who might be active there at this time. Guam is well represented by KG6s APP, JCM, and JDX, along with WB4LEE, K2IRT, and WA4SNY, all /KG6. No DUs have been heard recently, but it is felt that the path to the Philippines must have been open.

144-MHz operators enjoyed good auroral conditions through the fall, but it appears unlikely that there was any *E* skip worked on the 2-meter band when 6 was open for that mode. WB9NLF/WØMJS passes along an interesting idea he saw set forth in a government publication. "If the sunspot curves for cycles 19 and 20 are aligned so that the minima commencing the cycles coincide, the point in cycle 19 corresponding to its last great activity center (September, 1963) aligns with the activity in July, 1974." In terms of actual dates, the major aurora period of July 5, 1974 (see this column in September, 1974, *QST*) aligns with September 22, 1963. If you were around then, you may still remember that one. If not, see this column in December, 1963, *QST*. The big news that month was the Sept. 22 aurora, one of the greatest on record!

K1WHS, West Lebanon, Maine, finds his 160-element collinear EME array useful for other purposes. Dave checks solar noise with it, and has been forewarned of impending auroras several times. He started this, using a smaller horizon-aimed array, making checks at sunset, and got advance warning of the July, September, and October auroras. There have been other periods when solar noise is above normal, when there has been no radio aurora – but these would almost certainly tie in with periods of disturbed hf propagation. They might serve as tip-offs on coming winter E_s on 50 MHz, too. See 6-meter news.

The most recent 2-meter aurora report from K1WHS is for Nov. 12, when he worked 9s and 8s with good signals, while nearer stations were S9 via the buzz, 0400 to 0510 UT. The same night was good for tropo, down the coast. K4QIF, nearly 600 miles, was S9-plus on 432, as were K4DKC

and WA4TTG on 144. There were fm simplex QSOs between North Carolina and Nova Scotia, according to Dave, but we have no details here.

Oh, yes – the big collinear cuts the mustard on the EME route, too. Dave has worked WA7KYZ and K7BBO in Washington, and he caught VE2DFO on a random call. He is hearing WA7BJU, Oregon, W8KPY, W6PO, K2RTH, and WA2BIT, the *hard* way.

K2RTH, Franklin Square, NY, thinks that the universal window idea is great, except that it's almost *too* universal. QRM is getting bad! Bruce worked SM7BAE and VE2DFO Nov. 2, without skeds. His contacts also include W6PO, WA6LET, WA7KYZ, K8III, and WA2BIT. Heard are K4IXC, DK1KO, SMØAPR, KP4CJO, and K7BBO.

Both K2RTH and WA2BIT are using power winches made for Jeep-type vehicles, for elevating their antennas. This is a Sears product, used in a gravity-down, winch-up system that can be built quite simply. Bruce has a counterweighted H-frame, with the winch at the top, allowing the collinear to drop back away from the vertical support. Barry uses triangular tower sections for the array's main horizontal support, but otherwise the winching systems are similar.

K7BBO, Tacoma, WN, has 8 12-element KLM Yagis, 2 high and 4 wide, and the distinction of being the only moonbouncer above 145 MHz, in a band where everyone else is at the low end. This hasn't kept Dave from working WA7KYZ, VE2DFO, K8III, K1WHS, W8KPY, and WA2BIT. He can be reached for schedules by calling 206-572-4237.

W9YYF, Minooka, IL, broke into the moonbounce club with a "small" antenna – a 48-element extended-expanded collinear designed by W9SUV. His first contact on 2-meter EME was WA7KYZ, Nov. 2.

K5MWH, Rogers, Arkansas, makes that state available by more conventional methods, though he did have one EME QSO – with WA6LET. Mike is on almost every night, 9 pm local time, with K5FVN/Ø, on 144.105. He also works W5UPR, Houston, each morning at 6:45 am. For skeds, write Mike Watson, K5MWH, 1702 Dogwood, Rogers, AR 72756.

Not much meteor news this month, considering that we've recently been through the Leonids and Orionids. WB5LUA, Richardson, TX, and WØPS, Grafton, ND, tried in both showers, finally completing a QSO on a 20-second Leonids burst Nov. 17, 1449 UT. This was two-way 144-MHz ssb.

2-meter EME news from W5TVB – K5BXG, Tulsa, had his first EME success Oct. 31, working WA7KYZ for state number 44. Heard the same night: SM7BAE, K2RTH, and VE2DFO. The K5BXG array of 8 11-element Yagis is expected to "grow" to 16 soon. And an early November EME QSO may have set an EME DX record. VK5MC and WA2BIT made it via the moon Nov. 5.

Finally, K2KIR, North Syracuse, NY, is one SCM who is active on 2-meters. He'd like to know if there is any specific night or schedule time for the regular DXers on the low end. His address is on page 6, any recent *QST*.

Planning on a trip to Switzerland with your 2-meter fm rig? You'll need something besides a reciprocal operator's permit; frequencies are different over there. K4VOW reports that the most popular machine is the Shilthorn repeater, elevation 9850 feet. It's on 145.1/145.7 MHz, 5-kHz deviation 1750-Hz tone burst. Other repeater inputs are on 25-kHz spacing, input frequencies ranging up from 145.0 to 145.225 MHz. All have 600-kHz separation. The Shilthorn machine's receiver crystal oven went out while Ben was there, and he could not get modulation into it, because of their receiver drift. However, he had 145.7 MHz with him, and there was plenty of VFO activity, so he had a few simplex QSOs. (Rockbound USA fmers take note – VFOs!) Ben says he may have the only Shilthorn crystals in Alabama, in case you're interested.

432-MHz news dominates the 220-and-up scene, and the action here is mostly EME, with reports mainly from K2UYH. Al's November newsletter passes along the sad news of destruction of the VK2AMW EME installation by lightning. Transistors, diodes, relays and selsyns, among other things, were knocked out to a degree that may keep Lyle out of business for many months. K2UYH has asked VK2AMW for more information on his needs, especially for components that may not be available in Australia. Al will distribute this list when details are available, in the hope that some help may be given from this end. Prior to the catastrophe, VK2AMW had copied W4NUS, K2UYH, and ZE5JJ on 432.

The W6FZJ/1 installation (see December *QST* antenna article) provided a pleasant surprise for K2UYH the morning of Nov. 9. Other signals heard in early November included W4NUS, W1SL, and WØYZS/KØTLM. K7BBO now has 432 EME capability, but is hampered(?) by his commitments on 145-MHz EME, as reported elsewhere in this section. Early prospects for additional 432-MHz EME activity include VE4JX (with VE4MA), W4ZX1, and K1WHS/W1YTW. There are 10 calls on the 432-MHz EME schedule for late November and early December: K2UYH, VE7BBG, W6FZJ/1, W4NUS, WØYZS, W1SL, WØEYE, F8DO, OZ9CR, and KØTLM.

Just too late for last month's news, we received a summary of the K2UYH/WB2HHH 432-MHz expedition to Ashland, KY, where they and W4VQA put that state on the 432-MHz map. The "portable" station (8 13-element wood-boom Yagis on an el-az mount, kilowatt 7650 amplifier, 1-dB antenna-mounted preamplifier) was set up at the hilltop site of W4QVA Oct. 20, and operated

Dallas Johnston, W9AAG, Woodhull, Illinois, has been on the vhf bands a long time. Using mainly homebuilt gear of moderate power (150 watts on 144, 20 watts on 432) he stands well up on the states ladders on both bands. *(Photo by WØOHU)*

continuously from 1530 to 0300 Oct. 21. Weather was unseasonably cold. K8GMR reported 8 inches of snow in western Michigan, and a combination of rain and snow was falling at the W4QVA site; not the kind of weather for good tropo! Still, 15 different stations in 8 states and Canada were worked, mostly at distances in excess of 300 miles, and up to 440 miles. EME tests with WØYZS produced signals both ways, but no complete exchange, largely because of high winds that made precise aiming of the portable array difficult. The expedition added to several states totals, including that of K4QIF, who is now at 23.

OVS and Operating News

Organized activity at regular intervals can be the lifeblood of vhf interest, especially during seasons of the year when DX activity tends to wane. If you conduct any such activity-building program send in information along the lines of what appears below, and we'll be glad to publicize your efforts when column space is available. A good example is a northeastern operation that has been called the "What-have-you Weather Net." Started April 14, 1972, by W1UWU, WA1NGR, and WA1IIO, it has met daily at 10:30 am local time, ever since. Weather information is collected from all stations, but other news is equally welcome. Participation ranges from Northern New England to New York and New Jersey regularly, with as much additional area as band conditions permit.

WA1NGR, Chester, CT, is NCS, but he gets help from many others, and K1HFK, Weare, NH, has done yeoman service in this, despite his location, well up toward the northern part of the area normally covered. An average weekday morning will find 12 to 16 stations checking in (on 50.13 MHz) and weekend mornings there may be 30 or more. Ron, WA1NGR, is also NCS for the East Coast SSB Net Sundays, at 9:30 am local time, 145.025 MHz.

WA1OLK, Spencer, MA, reports 50-MHz auroral propagation on Oct. 12, 14, 15, 16 and 25.

W6FZJ/1, Chelmsford, MA, had his first EME QSO from W1 Oct. 29, working WØYZS then, and KØTLM (joint station effort with WØYZS) Oct. 31. Joe is still waiting for his first taste of the famous East Coast tropo on 432. Early cold weather must have done us out of it, for 1974. The ex-ex 128-element collinear described in December *QST* now radiates some 500 watts (after line losses) so W6FZJ/1 is ready for any kind of 432-MHz business. Late news: Joe is now W1JAA.

WB2JRX, Macedon, NY, lists the following vhf net operations in the Rochester area: Monroe County FM Net, Sunday, 9 pm, 19/79, or 28/88; Finger Lakes Net, Friday, 9 pm, 145.35; CD Net, Sunday, 8:45 am, 145.35; Rochester Area 6-Meter Net, Monday 9 pm, 50.4; Medicare Net, 10 am daily, 50.4. Times are local.

W3GOA, Philadelphia, participates in plenty of organized 6-meter activity, as follows. Calls are NCS. Sunday – Delaware Emergency Net, WA3QPX, 50.15, ssb, 10 am; East Coast SSB Net, WA2SAZ or K2EGH, 50.175, 11 am; Dixie 6-Meter Net, WB4NDT, 50.2, a-m, 11 am. Monday – Vertol Bears, WA3IUD, 50.65, a-m, 2000. Tuesday – VA Tidewater, WA3SKT/4, 50.11, ssb, 2000. Wednesday – Dixie 6-Meter SSB Net, WB4DNT, 50.11, 1900; Delaware Cty Public Service Net, WA3VEF, 50.635, a-m, 1930. Friday – Space Net, WB2MTU, 50.2, a-m, 2000.

2-METER STANDING

K1HTV	36	8	1310	K5PIK	29	9	1330
K1ABR	35	8	1478	W5SXD	25	6	1265
W1AZK	34	8	1412				
WA1FFO	32	9	2624	W6PO	20	9	8000
K1WHT	31	8	1300	W6GDO	18	5	1326
K1WHS	30	10	2500	W6WSQ	16	4	1390
K1UGQ	30	8	1370	K6QEH	13	4	2580
W1VTU	29	8	1296	K6HAA	13	4	2580
K1BKK	29	8	1275	K6JYO	13	4	1240
W1JSM	29	8	1100	K6HMS	11	4	1258
K1PXE	28	7	1250	WA6JRA	6	3	2591
K1MTJ	26	7	1250				
W1FZA	25	9	2750	W7JRG	28	6	1320
W1HDQ	24	7	1040	K7NII	25	5	1290
K1RJH	22	7	1450	K7ICW	18	4	1278
				WA7BBM	14	4	1250
K2RTH	39	10	2590				
W2AZL	38	9	2500	W8KPY	42	10	2050
W2NLY	37	8	1300	K8AXU	38	8	1275
W2CXY	37	8	1360	W8IDU	36	8	1150
W2ORI	37	8	1320	W8YIO	36	8	1100
W2BLV	36	8	1150	W8IDT	36	8	1150
WA2FGK	33	8	1340	K8DEO	35	8	1200
W2CUX	33	8	1334	K8HWW	32	8	1125
WB2WIK	32	8	1080	WA8PIE	32	8	1000
WA2CJK	31	8	1160	W8NOH	31	8	1165
W2CRS	30	8	1270	WA8LLY	28	8	820
K2CEH	27	8	1200	W8TIU	24	8	1000
W2CNS	27	8	1150	W8KBC	24	7	900
K2DNR	27	7	1200	K8ZES	22	8	675
WB2SIH	25	6	1000				
WA2UDT	24	7	1020	W9YYF	43	9	4500
WA2EMB	23	6	1335	K9UIF	43	9	1575
K2BWR	23	7	1350	K9UGD	42	9	1300
WA2PMW	23	6	1000	W9AAG	41	9	1200
W2DWJ	23	6	860	K9AAJ	41	9	1200
				W9BRN	36	9	1260
K3CFY	37	8	1237	W9PBP	34	8	820
W3RUE	36	8	1250	K9HMB	33	10	1820
W3BHG	35	8	1260	K9UNM	33	8	930
W3GKP	32	8	1108	WB9NLF	30	9	1819
W3BDP	29	8	1225	W9JDJ	29	8	1000
W3LNA	27	8	970				
W3OMY	26	8	800	KØMQS	46	10	10605
K3CFA	25	8	1200	WØLER	44	9	1440
W3TMZ	24	8	1000	WØDQY	41	9	1300
W3HB	23	8	1310	WAØCHK	40	9	1120
W3ZD	22	8	950	WØLFE	40	9	1100
W3TFA	21	8	1342	WØRLI	36	9	1293
K3OBU	21	7	930	WØEYE	35	9	1380
K3QCQ/3	20	7	900	WØENC	35	9	1360
				WØEMS	34	10	1320
K4GL	40	10	2340	WØLCN	33	9	1100
W4HJQ	39	9	1150	WØDRL	27	9	1295
W4WNH	38	9	1350	WØMJS	26	8	1118
W4HHK	38	9	1280				
K4IXC	37	9	2480	VE1ZN	7	2	500
K4EJQ	37	8	1125	VE2DFO	37	9	10605
W4VHH	36	8	1125	VE2YU	32	8	1200
W4CKB	35	8	1440	VE2BZD	23	7	1309
K4QIF	35	8	1225	VE2HW	18	6	800
W4FJ	34	8	1150	VE3ASO	37	8	1290
W4AWS	29	8	1350	VE3BQN	37	8	1250
W4ISS	29	8	1000	VE3EZC	33	8	1283
				VE3AIB	29	8	1340
W5UGO	43	10	1398	VE3EVW	29	8	1100
WA5UNL	42	10	1700	VE3DSS	27	8	1200
W5ORH	42	10	1507	VE3CWT	27	7	1072
W5RCI	42	9	1289	VE3EMS	27	8	1100
K5BXG	41	10	1394	VE7BQH	12	3	7920
W5WAX	39	10	1370				
K5WXZ	38	10	1450	KH6NS	3	2	6000
W5HFV	38	10	1285	SM7BAE	1	1	11055
W5AJG	33	9	1360	VK3ATN	4	4	10417
W5UKQ	33	9	1290	VK5MC	3	3	10000
W5LO	30	7	1325	ZL1AZR	2	2	11055

Figures are states, call areas, and best DX in miles.

WA3SEE, Bethesda, MD, offers the following hint for 2-meter mobile fm operators. Squelch is

(Continued on page 162)

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1BYW, John W. Anderson, Old Saybrook, CT
W1EVN, Howard F. Morse, Keene, NH
W1FJ, Robert J. LaCava, Revere, MA
K1HGP, Lyman R. "Skip" Dodge, Jr., Melrose, MA
W1IGY, Harold S. Roosevelt, Springfield, MA
K1SUB, Oliver L. Bessette, Danielson, CT
W1WI, Daniel T. McNamara, Tyngsboro, MA
W1ZG, Walter F. Goddard, Boston, MA
W1ZXD, John E. Brennan, West Bridgewater, MA
W2BA/W1ZO, Fullerton D. Webster, Mountain Lakes, NJ
W2BZP, Thomas H. Phelan, Maywood, NJ
WA2CAP/W2KWU, Walter H. Shanessy, Jamaica, NY
W2DDG, George R. Stephani, Monroe, NY
W2HLQ, Joseph J. Sanders, Geneva, NY
WA2IKB, Henry R. Kreutter, Arcade, NY
W2PT/W3BEP, Stephen P. Marion, Brooklyn, NY
WN2RUR, Hyman J. Hatton, East Northport, NY
W2TJ, Frank R. Shaw, Pleasantville, NJ
W2VPE, Charles S. Syers, Rahway, NJ
W3BIZ, Henry C. G. Fonteyne, Glen Burnie, MD
W3DFU, Richard W. Crist, Sr., Drexel Hill, PA
WA3PKS, Robert A. McKenzie, Silver Spring, MD
WA3RAE, James E. Jones, Wilmington, DE
K3REH, Edward J. Boyle, Levittown, PA
W3RKF, Anthony A. Chizmadia, Philadelphia, PA
W3UK, William P. Gilkey, Cedars, PA
W4ABL, Ralph T. Spicer, Key Largo, FL
K4AGA, Paul F. McComas, St. Petersburg, FL
WN4BEI, Maurice E. Sawyer, Wilson, NC
WA4BOF, Richard L. Garst, Salem, VA
W4DME, Carl R. Yow, Randleman, NC
Ex-W4FUP, Lloyd W. Harris, Wichita, KS
W4GI, William F. Williams, Stone Mountain, GA
K4GYU, Raymond R. Hicks, Macon, GA
W4OEW, Edward D. McCarter, Marietta, GA
K4OFI, Aubrey H. Jenkins, Largo, FL
W4WTB, Wallace O. Uebelein, Paducah, KY
WB5CJJ, Walter L. Carrico, Lufkin, TX
WA5DKJ, Carl B. Chism, Mounds, OK
WA5MCD, John R. Turcotte, Sugarland, TX
K5MSQ, Leland M. Salinger, Brownsville, TX
WA5VBW, George H. Mayfield, Grand Prairie, TX
W6BQI, George D. Whittet, Monterey Park, CA
W6DDA, Kenneth I. Schouten, Porterville, CA
KH6HIZ, John A. Hansen, Kailua Kona, HI
WA6HTV, Robert R. Rissman, Los Angeles, CA
K6HZ, Elmer E. Johnson, San Francisco, CA
WA6ITX, Norman J. Wintermeyer, Madera, CA
W6MFN, Milton D. Donovan, Palo Alto, CA
W6OA, John E. Walstrom, Orinda, CA
WN6RRD, Ernest J. Nielsen, Selma, CA
K6TAV, Kenneth W. Bridgman, Montebello, CA
W6ZPW, Robert L. Mayer, Lompoc, CA
W7GOL, Frank H. Schumann, Portland, OR
Ex-8AAR, Vernon B. Stouffer, Cleveland, OH
* K8QYJ, Gerald R. Moore, Sidney, MI
WB8CNY, Marvin E. Grubb, Bellevue, OH
W8LDI, William H. Thompson, Milford, MI
K8ZMF, William J. Lightfoot, Shaker Heights, OH
W9ANH, Henry A. Bader, Terre Haute, IN
W9APG, Harold A. Ferguson, Indianapolis, IN
W9AVM, Harold V. Humphrey, Morrisonville, WI
WB9BYR, Edward W. Speck, Harvey, IL
Ex-W9DSU, Harry O. Dunn, Mountain Home, AR
W9FDR, Joseph F. Novy, Westchester, IL
Ex-W9HDC, Edgar R. Kamrath, Beaver Dam, WI
W9WHN, Robert W. Schmidt, Davenport, IA
WØAY, Robert E. Whitmer, Shawnee Mission, KS
WØPG, Michael D. Lyons, Arvada, CO
Ex-WØPJT, Alden A. Rova, Bismark, ND
VE3AHF, Sterling M. Finlay, Gorrie, ON
VE3DU, Dave S. Hutchinson, London, ON
VE3HHV, B. Vandenberg, Pickering, ON
VE4TJ, Al C. Jebb, Winnipeg, MB
VE6JW, Michael F. Swaile, Emonton, AB
VE6RJ, Gordon L. Scott, Edmonton, AB
VE7YH, M. D. Young, Gibsons, BC
PAØDSR, J. W. A. Oosterbaan, Hilversum, The Netherlands
ZL3IA, Sid J. Langrope, Akaroa, New Zealand

* Life Member.

Coming Conventions

(Continued from page 67)

will also be held by The Medical Amateur Radio Council, Frankford and Potomac Valley Radio Clubs, Radio Club of America and others. A special program for the XYL and YL is planned to keep them entertained for the entire convention weekend.

Some key committee members are: Stuart Meyer, W2GHK/4, General Chairman; Bud Smith, W4YZC, Vice Chairman; Bob Zaepfel, K4HJF, Secretary and Legal Advisor; John Manning, WB4MAE, Treasurer; Rita Des Roches, XYL of W4WKT, Ladies Program; Tex DeBardeleben, W4TE, Registrations; Hugh Turnbull, W3ABC, Banquet Arrangements. For more detailed information write NOVARC, P.O. Box 682, McLean, VA 22101. QST

IARU News

(Continued from page 76)

Amateur Reciprocal Operating Agreement with Canada. In addition, it is the belief of the Department that for the forseeable future, Canadian amateurs temporarily resident in Mexico will not be permitted to operate their stations by the Mexican authorities. Therefore, the Canadian Department of Communications will no longer issue permits to Mexican amateurs.

It has not been possible for U.S. amateurs visiting Mexico to operate for several years, except under rare exceptions for special events. The complete list of "DX Operating Notes" concerning reciprocal operation, international third-party traffic, and "banned" countries last appeared in this column for September, 1974. QST

Strays

ARRL Director W6KW, John Griggs, has just about sworn off cw. He says it is bad enough trying to explain that 6KW to the FCC without having to alibi for sending LO SOS OS California. – *QCWA News*

QST **congratulates . . .**

Richard Terrell, W8HKX, elected Vice-Chairman of the Board of Directors of General Motors Corp.

Arthur S. Westneat, Jr., W1AM, named chairman of the Oceanography Coordinating Committee of the IEEE.

Operating Events ..... de W1YL

JANUARY

1 *Straight-Key Night*, p. 82 Dec.

2 *West Coast Qualifying Run* (W6ZRJ prime, K6DYX alternate) 10-35 wpm at 0500 UTC (Universal Coordinated Time, calculated as per GMT) on 3590/7090 kHz. This is 2100 PST the night of January 1. Please note that dates are always shown at least 2 months in advance and times are always the same local "clock time," i.e. 9 PM local Pacific time. Underline one minute of the highest speed copied and send to ARRL for grading. (ARRL Form CD-9 shows qualifying run schedules for both the west coast and W1AW runs as well as the complete W1AW code practice schedule.)

4-5 *VHF SS*, p. 55 Dec.

11-12 *CD Party*, cw. (This is a quarterly event open to all ARRL appointees and officials, notified separately by bulletin. It starts at 2300Z Jan. 11 and ends 0500Z Jan. 13, same time periods standard/daylight time. Contact your SCM, p. 6, to see if you can qualify for an appointment. The July parties are open to all ARRL members. *CW QRP Contest*, *YU 3.5 MHz DX Contest*, p. 82 Dec.

15 *W1AW Qualifying Run* (10-35 wpm at 0230 GMT/UTC), transmitted simultaneously on 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. This is 2130 EST (9:30 PM local eastern time) the night of January 14. Underline one minute of top speed copied, certify copy made without aid and send to ARRL for grading. Please include your full name, call (if any) and complete mailing address. A legal size s.a.s.e. would be appreciated.

15-16 *DX-YL to Stateside YL Contest* cw, p. 111 Nov.

17-18 *Arkansas QSO Party*, p. 82 Dec.

18-19 *CD Party*, phone.

25-26 *SIMULATED EMERGENCY TEST*, p. 59 Dec. *French Contest* cw, p. 82 Dec.

29-30 *DX-YL to Stateside YL Contest* phone, p. 111 Nov.

FEBRUARY

1-2 *DX Competition* phone, p. 56 Dec.

1-9 *Novice Roundup*, this issue.

2 *Two-Meter RTTY Contest*, sponsored by the Tu-Boro Radio Club, on 145.620 MHz, on Sun, Feb. 2 from 6 AM to midnight, local time. A special certificate for working 5 members of the club. All inquiries, logs and certificate applications will be accepted by the club until March 1. Send to Tu-Boro Radio Club, 149-14 Fourteenth Avenue, Whitestone, NY 11357.

5 *West Coast Qualifying Run.*

7-9 *QCWA QSO Party*, 18th annual, sponsored by the Houston Chapter. Starts 2400Z Fri. Feb. 7, ends 2400Z Sun. Feb. 9. Activity will be within about 5 kHz from: cw, 3550 7050 14050 21050 28050; phone, 3900 7240 14270 14340 21390 21435 28600; RTTY, 3595 7095 14095 21070 28070; fm, 146.55 simplex. The theme this year is Accent on the Chapters. Scoring will be the no. of contacts times the no. of chapters contacted times the no. of QCWA Directors worked. With 69 chapters, plus ten QCWA directors, the scores are going to be high. Members not associated with a chapter will use "at large" instead of a chapter name. Show total contacts, total multipliers and score. Usual log. Your entries should be sent to W5YZ, QCWA Houston Chapter, P.O. Box 55254, Houston, TX 77055. Mail before March 10. See Dec. QCWA News for further info.

8-9 *Wheat Belt QSO Party*, sponsored by the Saskatoon Amateur Radio Club, 24 hours duration starting 1800Z Feb. 8, ending 1800Z Feb. 9. Sask. stations and SARC members refer to the Green Sheet. Contacts on all bands/modes to include name, QTH, RST. Info. de SCM VE5RP. *Annual Ten Meter Contest*, sponsored by the Ten-Ten International Net of Southern California, Inc., open to all, full 48-hour period GMT. All contacts must be made on 10, any mode. Logs to include date/time, station, name, QTH and 10-10 no. (if a member of the net). Participation by non-members welcomed though no eligible for awards. You may submit a list of stations worked plus $2 to your District Manager to qualify for membership and a 10-10 number. Members score 1 point per contact, add a point if with a 10-10 member and add an extra point if out-of-state (or province), or if out of country. Please give the name of your chapter to receive credit for chapter scores. Members send logs to Grace Dunlap K5MRU, Box 445, La Feria, TX 78559. Entries must be postmarked no later than March 15. Send large business size s.a.s.e. for a copy of the results.

9 *Frequency Measuring Test*, open to all, begins with a callup at 0230 and 0530 GMT Feb. 9. Remember, this is the evening before, local time! The periods for measurement start at 0237 (80 meters), 0245 (40 meters) and 0253 (20 meters); for the late run, 0537, 0545, 0553 respectively. Each measuring period lasts five minutes. Submit your averages for each 5-minute period which will be compared with the umpire's averages during the same period. (The umpire is a professional measuring laboratory.) Tell how many readings you took to form your averages. Approximate frequencies for the early run are 3538, 7034 and 14,085 kHz. Late-run frequencies are 3535, 7050 and 14,121 kHz. Your entry must be received by February 20 to qualify for the April QST report of the competition. W1AW will start transmitting the official readings in a Special W1AW Bulletin February 21.

13 *W1AW Qualifying Run.*

15-16 *DX Competition* cw, p. 56 Dec.

22-23 *YL/OM Contest* phone, p. 88 Dec. *French Contest* phone, p. 82 Dec. *Vermont QSO Party*, sponsored by the Central Vermont Amateur Radio Club, open to all, from 2100Z Feb. 22 through 0100Z Feb. 24. VT stations score 1 point per QSO and multiply by the no. of ARRL sections and countries worked. All others score 3 points per VT station worked and multiply total by the no. of VT counties worked on EACH band. The same station may be worked again on each band and mode. Mobiles may be worked considering each new county they enter as a new station. Trophies, certificates. Try cw on the odd hour, phone on the even hour GMT. Suggested freqs.: 3685 3909 7060 7265 7290 14060 14290 14325 21060 21375 28100 28600 50260 50360 144-144.5 145.8. Exchange QSO no., RS(T) and county (for VT); others use ARRL section for location. Mail entries with s.a.s.e. by April 30 to PETER Kragh W1AYK/K2UPD, 170 Summit Ave., Ramsey, NJ 07446.

MARCH

1-2 *DX Competition, phone.*

6 *West Coast Qualifying Run.*

8-9 *YL/OM Contest, cw.*

14 *W1AW Qualifying Run.*

15-16 *DX Competition, cw.*

22-23 *Tennessee QSO Party, BARTG Spring RTTY Contest.*

24 *W1AW Morning Qualifying Run.*

April 5-6, SP DX Contest.

April 12-13, CD cw, Swiss Contest (H-22).

April 19-20, CD Phone, Bermuda Contest phone, RTTY WAEDC.

April 26-27, PACC.

May 3-4, Bermuda Contest cw.

May 10, FMT.

May 17-18, Michigan QSO Party.

June 14-15, VHF QSO Party.

June 21-22, West Virginia QSO Party.

June 28-29, FIELD DAY.

Sept. 6-7, VHF QSO Party.

Changes of Address

Please advise us direct of any change of address. As our address labels are prepared in advance, please allow six weeks notice.

Operating News

GEORGE HART, W1NJM
Communications Manager
ELLEN WHITE, W1YL
Deputy Communications Mgr.

Affiliated Clubs. The name of this column has been "Operating News" since Sept., 1934. Prior to that it was labeled "Communications Department" and up until May 1931 appeared only in members' copies.

The administration of affiliated clubs has been a function of the CD since 'way back in the early twenties. Not appropriate? Why not? Isn't this a form of communication? Anyway, this is how we've been set up for some 50 years or more, and since that was the way of it, it has been appropriate to discuss the affairs of clubs in the CD part of the magazine. When the column heading was changed to "Operating News" (because after all, the CD isn't the only department at HQ, why should it have a separate column?), club news and doings continued to appear therein. Now the CD has a branch at headquarters devoted entirely to clubs and training aids, and news of its doings will appear in this column, as it always has before. No use changing it just for the sake of making a change, eh?

So, what's new in the club picture? Since many of you member-readers belong to affiliated clubs, you may already know all about it from reading the *Affiliated Club Bulletin*, delivered to your club secretary three or four times a year. What, you never saw it? Better get after your secretary, or whoever gets club mail, to produce it at club meetings or otherwise make it available to members. In any event, maybe a rundown of recent content will be of interest.

The May A/C Bulletin dealt with Field Day (what else?). Although now past history, the 1974 FD incorporated several changes intended to promote the emergency communications aspect of the exercise. The Contest Advisory Committee has wrestled with the philosophy of FD on and off for several years, and the 1974 changes were a result of their deliberations. A just-completed CD Bulletin poll indicated the majority of respondents wish the Emergency Communications Advisory Committee also to have an active part in formulating FD rules. Both the CAC and ECAC operate on the basis of comment and response from you and your club. Since FD is largely a club exercise, if your club has comments on FD rules be sure to express them to the appropriate committee.

The same May bulletin contained some "good ideas" borrowed from club newsletters. This passing-on of information is one of the functions of your CD, but naturally the initiative for it is yours; we can't pass on information we don't receive. Such ideas to enhance attendance, participation, activities, programs are valuable to all. Don't keep them a secret, please.

The Fall A/C Bulletin toured the "Club Kit," available to any group on request. Although slanted primarily toward new, as-yet-unorganized groups, some of the older established groups may also find items of interest. Such things as "hints and kinks" for the program chairman, a sample constitution, and a couple of money-saving ideas come to mind.

The next subject was licensing classes, including some form of recognition for outstanding teachers of such. Many services which the CD has to aid clubs in such efforts were described.

On the last page, we got down to the nitty-gritty, the problems which concern all of us first and foremost: how to get new members, keep old ones and make the club worthwhile for its membership. "The Little Guy" was the title of that section of the bulletins, because he is the one we're after – the fellow who is not on the air, whose only contact with other amateurs is at radio club meetings, who wants to participate in amateur

Meet Cy Huvar, W6GBF, the hard working San Diego SCM who ran the ARRL booth at the recent Southwestern Division Convention in San Diego. For another view of an SCM in action turn the page!

W1AW SCHEDULE

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M. - 1 A.M., Saturday 7 P.M. - 1 A.M. and Sunday 3 P.M. - 11 P.M., (all times local Eastern). The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request. If you wish to operate, you must have your original operator's license with you. The station will be closed Nov. 28, Dec. 25, 1974, and Jan. 1, Feb. 17, and Mar. 28, 1975.

Times/Days

CST	*UTC*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*
0740	1340	←		Oscar[9]		→	.....	.....
0800	1400	CODE PRACTICE[1] (5-25 wpm MWF, 35-15 wpm TTh) Details Below					.....	.....
1200-1300	1800-1900	21/28 cw[7]*	21/28 ssb[8]*	21/28 cw[7]*	21/28 ssb[8]*	21/28 cw[7]*	.....	.....
1300	1900	←		Oscar[9]		→	.....	.....
1320-1400[4]	1920-2000[4]	14.290*	14.080*	14.290*	14.080*	14.290*	.....	.....
1400-1500	2000-2100	7.080*	7.290*	7.080*	7.290*	7.080*	.....	.....
1500	2100	← CODE PRACTICE[1] (10-13-15 wpm) Details Below →					.....	Oscar[10]
1530	2130	←		CW Bulletin[1]		→	.....	.....
1600-1630[4]	2200-2230[4]	7.1 Nov.[5]*	21.1 Nov.[5]*	28.1 Nov.[5]*	21.1 Nov.[5]*	7.1 Nov.[5]*	.....	Oscar[11]
1630	2230	←		RTTY Bulletin[3]		→	.....	.....
1700-1800[4]	2300-0000[4]	CPN[6]	14.095 RTTY*	3.625 RTTY*	7.095 RTTY*	CPN[6]	.....	.....
1800-1830	0000-0030†	.....	CN[6]	.....	CN[6]	.....	.....	.....
1830	0030†	←		CODE PRACTICE[1] (10-13-15 wpm) Details Below		→		
1900	0100†	←		CW Bulletin[1]		→		
1930-2000[4]	0130-0200[4]†	3.7 Nov.[5]*	14.080*	14.080*	7.1 Nov.[5]*	14.080*	.....	.....
2000	0200†	←		Phone Bulletin[2]		→		
2010-2030[4]	0210-0230[4]†	3.990*	50.190*	145.588*	1.820*	3.990*	.....	.....
2030	0230†	← CODE PRACTICE[1] (5-25 wpm TThSatSun, 35-15 wpm MWF) Details Below →						
2130-2200[4]	0330-0400[4]†	3.580*	.....	1.805*	.....	3.580*	.....	.....
2200	0400†	←		RTTY Bulletin[3]		→	.....	.....
2230	0430†	←		Phone Bulletin[2]		→	.....	.....
2240-2300[4]	0440-0500[4]†	7.290*	3.990*	7.290*	3.990*	7.290*	.....	.....
2300	0500†	←		CW Bulletin[1]		→	.....	.....
2330-0000[4]	0530-0600[4]†	3.7 Nov.[5]*	7.080*	3.580*	7.1 Nov.[5]*	3.580*	.....	.....

[1]CW Bulletins (18 wpm) and code practice on 1.805, 3.580, 7.080, 14.080, 21.080, 28.080, 50.080 and 145.588 MHz.**
[2]Phone Bulletins on 1.820, 3.990, 7.290, 14.290, 21.390, 28.590, 50.190 and 145.588 MHz.**
[3]RTTY Bulletins on 3.625, 7.095, 14.095, 21.095 and 28.095 MHz.** Bulletins at 170 Hz shift, repeated at 850 Hz shift when time permits.
[4]Starting time approximate, following conclusion of bulletin or code practice.
[5]W1AW will tune the indicated band for Novice calls, answering on the caller's frequency.
[6]Participation in traffic nets.
[7]Operation will be on one of the following frequencies: 21.02, 21.08, 21.11, 28.02, 28.08, 28.11 MHz.
[8]Operation will be on one of the following frequencies: 21.26, 21.39, 28.59 MHz.
[9]When an Oscar satellite is in orbit, daily updated orbital data is sent at 18 wpm on cw frequencies.
[10]Oscar orbital data for the coming week, on cw frequencies.
[11]Oscar orbital data for the coming week, on RTTY frequencies.
* General contact period.
** No 10- or 15-meter activity from 2030-0000 CST.
† Indicates following day when UTC is being used.
All frequencies are approximate.

W1AW CODE PRACTICE

W1AW transmits code practice according to the following schedule. Approximate frequencies are 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. For practice purposes the order of words in each line may be reversed during the 5-13 wpm transmissions. Each tape carries checking references.

Speeds	*Local Times/Days*	*UTC/Days*
10-13-15	7:30 PM EST dy	0030 dy
	4:30 PM PST	
10-13-15	4:00 PM EST MTHThF	2100 MTWThF
	1:00 PM PST	
5-7½-10-13-20-25	9:30 PM EST SnTThS	0230 MWFSn
	6:30 PM PST	
5-7½-10-13-20-25	9:00 AM EST MWF	1400 MWF
	6:00 AM PST	
35-30-25-20-15	9:30 PM EST MWF	0230 TThS
	6:30 PM PST	
35-30-25-20-15	9:00 AM EST TTh	1400 TTh
	6:00 AM PST	

Jan. 6:	It Seems to Us
Jan. 9:	Correspondence
Jan. 17:	League Lines
Jan. 21:	ARPS
Jan. 29:	World Above
Feb. 3:	YL News

radio perhaps vicariously by belonging to a local club.

We asked for help from your group in the bulletin, and now we're asking again. What is your club doing to stay active and healthy? What secret for success do you have? What attracts newcomers and "little guys" to your club? Are you using any special techniques in your Novice class that work? Is your club growing by leaps and bounds, and do you have consistently popular and worthwhile activities? If so, let us know just what you're doing and how you're doing it, so we can pass it on to others. – *WA1STN/W1NJM*

Brevity Code. The chairman (W9ESG) of the Emergency Preparedness and Disaster Operations

5-BAND AWARDS

(Updating the December 1974 listing.)

5BDXCC: (Starting with number 374), I1BGJ YU2BHI W9DD.

5BWAS: (Starting with number 188), W5EL K5SIN.

Committee of the Associated Public-Safety Communications Officers (APCO) has suggested that amateurs may do well to become familiar with the Aural Brevity Code used in many other services and perhaps even adopt it as an amateur standard, especially in repeater operation. In support, he furnishes us with a copy of an excerpt from a recent issue of the APCO Bulletin listing this code and summarizing the results of a government project concerned with revising the code for better standardization. Let's take a look.

Many amateurs look at the so-called "10 Signals" as a hodge podge of signals used for "cops and robbers," but the fact is that they have been used extensively and, for the most part, efficiently, by a number of public-safety services for many years. Perhaps we should stop making jokes about them and start considering them as a part of a universal voice-procedural language in our own operations. The revised "10" signals list contains specific meanings for numbers up to 40, except the last five are reserved for future use. Numbers above 40 are used for special purposes and have significance only to those to whom especially assigned. That is, if you hear a number above 40 it does not apply to you unless you happen to be a member of the special group involved.

We advanced the thought that the name "brevity" was a bit of a misnomer, since of the 34 signals below 40, 21 of them take as long as or longer to say than do their meanings. The answer to this is that "brevity" does not refer simply to the length of time in speech, but also to "response time" through quicker understanding. Here are six advantages to use of the new revised 10-code signals, as summarized by APCO and with comments by yours truly:

1) Improved accuracy of communications within and between systems. No doubt if everybody used the same code and same meanings, whether 10-something or Q-something or Z-something, the interface between systems would be improved insofar as intelligibility of communication is concerned. Aside from that, is it any quicker or more intelligible or "accurate" to say "Location," or "QTH" or "Ten-twenty"? APCO study says the latter is more understandable.

2) A reduction of system response time. This seems a little hard to sink your teeth into, but if we accept the first hypothesis that accuracy of communications between systems will be improved, it does stand to reason that system response time will decrease along with it.

3) An enhancement of system discipline. This wouldn't necessarily seem to follow, but assuming the validity of the above points it probably would.

4) Increased privacy. No doubt about this advantage. These signals are not secret, by any means, but the average or casual listener wouldn't know what "10-23" means, for example, whereas the impact of the communication would be very apparent if it were simply stated "I have arrived at the scene of the incident."

5) Applicability to standardization of newly developing automatic system keyboard indexing. Huh? This could be an advantage to somebody, but it's a complete blank to us amateurs.

6) More efficient use of training time. Where training is being conducted on an inter-service or inter-system basis, this is probably quite valid. It prevents the necessity for communicators having to be retrained in procedures used by other services when or if intercommunication is required. It would even make possible a "pooling" of training facilities up to a certain point.

Here is a list of the 10-signals as revised by APCO's "Project 14":

10-1 Signal weak.	10-18 Urgent.
10-2 Signal.	10-19 (In) contact.
10-3 Stop transmitting.	10-20 Location.
10-4 Affirmative (OK).	10-21 Call ____ by phone.
10-5 Relay (to).	10-22 Disregard.
10-6 Busy.	10-23 Arrived at scene.
10-7 Out of service.	10-24 Assignment completed.
10-8 In service.	10-25 Report to (meet).
10-9 Say again.	10-26 Estimated arrival time.
10-10 Negative.	10-27 License/Permit info.
10-11 ____ on duty.	10-28 Ownership info.
10-12 Stand by (stop).	10-29 Records check.
10-13 Existing conditions.	10-30 Danger/Caution.
10-14 Message/information.	10-31 Pick up.
10-15 Message delivered.	10-32 ____ units needed.
10-16 Reply to message.	10-33 Help me quick.
10-17 Enroute.	10-34 Time.

Keeping things under control in the League booth at the recent Pacific Division Convention in San Mateo was Santa Clara Valley SCM Jim Maxwell, K6AQ/W6CUF. Jim is a former chairman of the Contest Advisory Committee.

DX CENTURY CLUB AWARDS

New Members

Radiotelephone listings follow the general-type "New Member" and "Endorsement" listings – October 1-30, 1974.

UR2AR	332	JA3BCC	146	WA9WDP	114	WB6PZW	107	DL6WF	102	DL3GC	100
OH5VT	302	SM5EEP	140	SM4CTT	114	DL8WX	106	K9GCX	102	HB9AXB	100
JA3ART	260	VE7ALB	127	W3RAB	112	G3RYV	106	WA4UVG	102	K5LXZ	100
JA2DJH	250	JA1EMX	126	YU4VKR	112	K9UTN	106	DK3SS	101	WA1STN	100
G3TXF	236	K6AG	120	W3EUU	111	PY2CDN	106	F6CLH	101	W5TBW	100
WA9BWY	200	JA2AO	117	JA2IU	110	9V1QD	105	OK1CFH	101	WA6BWJ	100
F6BEE	184	DK2SS	116	ZL4PM	110	JA1KW	103	WB4ADD	101	W7DAZ	100
JAØCVC	153	IT9TGO	115	LZ2KAF	109	VE2AFU	103	W7VSS	101	4Z4BR	100
		WA1AHQ	115	KØUTX	107	WA4LPX	103	WA9YDO	101		

UR2AR	323	JA3ART	220	LU8AJG	115	HI8XKP	104	9V1QD	104	K4ST	100
EA4DO	301	WA9BWY	140	JA2AO	112	IH9JT	104	WB2HTJ	103	WA6ZNQ	100
XE1TX	269	I4BKM	127	W3EUU	111	W2REH	104	WAØYJL	103	ZL2GJ	100
G3TXF	227			HK4DEG	109			K9GCX	101		

Endorsements

In the endorsement listings shown, totals from 120 through the 240 level are given in increments of 20, from 250 through 300 in increments of 10 and above 300 in increments of 5. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

W6AM	355	W1YL	310	K2GBC	250	DJ6OZ	200	YU2RKC	180	WA2KWP	140
W1HX	350	K4HPR	305	K4JWD	250	DK5EL	200	FA7OH	160	W3EEK	140
K3BW	340	K4CYU	300	W2REH	250	G3IZJ	200	JA1QXY	160	WA3DVO	140
W8OK	340	W4AAV	300	WA6FYC	250	K6ELX	200	KH6CF	160	WØJKF	140
IT9ZGY	335	OZ7BG	290	WB2AIO	240	W3NL	200	W2SEG	160	DL7RT	120
OE1FF	330	K4GFI	280	W7DH	240	W3YT	200	WA4BTC	160	K4BE	120
ON4PA	325	OH2SB	280	W9BMD	240	W4BAA	200	WA4DHO	160	K4PHY	120
SMØAJU	325	WA6LLY	280	DJ3NK	220	WA5LUM	200	WA5STI	160	K4SV	120
HB9DX	320	WB2AMO	280	K4SGL	220	W6OKX	200	WB5EAY	160	K6OL	120
JA7AD	315	W1AM	270	K7PJF	220	W7UUO	200	WØIJ	160	OZ7AN	120
W6GMF	315	W2SJM	260	W2BZL	220	WØKH	200	CN8BO	140	VO1HP	120
W8DX	315	HB9RX	260	W7NP	220	K7AY	180	DJ8PA	140	WB4QGN	120
G6RC	310	JA1BLV	260	WA7BPS	220	VE3DMC	180	K7NHV	140	W9MTT	120
OK1ADP	310	JA1WVK	260	WØJMB	220	W4WFL/1	180	OK1OAT	140	WB9DDQ	120
		OE1CP	260	YU2NHI	220	W2GRR	180	W1GNC	140		

W6GVM	350	K4GFI	280	EA3JK	220	W8DX	220	CT1IC	180	WA6BCD	140
W1HX	330	W2EHB	260	DJ3HJ	220	XE1CI	220	WA5LUM	180	W7HNL	140
W3FWD	320	WA5WEY	260	G3ZBA	220	DL2VS	200	JA3FD	160	DL3RE	120
W1FXD	315	WA6LLY	260	K4JWD	220	JA1WVK	200	OK1ADP	160	I1SUI	120
OE1FF	310	WA6FYC	250	KH6BZF	220	K7GEX	200	W4BAA	160	OK1OAT	120
9M2DQ	300	W8SET	250	OZ7BG	220	WØKH	200	W4EPZ	160	WB9DDQ	120
W3ICQ	290	JA1BLV	240	W5KXQ	220	DJ3NK	200	W3NL	140	YA1LM	120

The question naturally arises, "How does one use this so-called brevity code?" Well, we aren't prepared at this point to go into details, but note that each of the above signals starts with the numeral (or word) "ten."

Why not skip the "ten" and just give the other number? Because prefacing the signal with "ten" is not only easily understood (linguistically-speaking) but is an indication that a brevity signal is intended. It's like the Q of a cw Q signal. If you omit the "ten," the number could refer to something else, but preceded by the ten, the receiving operator knows precisely what is intended (although if he isn't well trained he may have to consult the list). An encoded transmission might go like this: "My 10-26 at your 10-20 is 9 o'clock but may be later due to road 10-13."

The question is, do we want to use these signals as standard amateur procedure? If not, groups of amateurs engaged in specialized activities may wish to do so anyway, even adding some signals above 10-40 for their unique requirements. – *W1NJM*

NOVEMBER 9 FMT RESULTS

Reported by W1YL

The November 9 ARRL Frequency Measuring Test was down appreciably in the number of entries (partly due to conditions, possibly because of a change in scheduling). Most of the participants realized the sudden change to Standard Time influenced W1AW scheduling (FMTs, as does code practice, always occurs at the same local clock time). Most of the "regulars" caught the W1AW bulletin regarding the time change. To the others, our apologies and good luck in February! A total of 126 entries were received representing 1671 individual measurements; 26 participants achieving Honor Roll quality. The late twenty-meter run again suffered the fate of poor propagation and was not used in calculating the averages to follow. The umpire measured frequencies for the early run at 3544.449, 7039.087 and 14107.910 kHz. The late run checked out at 3537.123 and 7070.418 kHz.

Those new to the program interested in an appointment as an ARRL Official Observer should check with their SCM (page 6) to see if they can qualify. The next FMT is scheduled for February 9 with rules in full in Operating Events, this issue.

A special thanks to the many participants who commented with appreciation on the new style of reporting.

HONOR ROLL

This top listing is the standing of the frequency measuring leaders. In consideration of the minimum possible error due to doppler and other unavoidable factors, we accredit as of equal merit all those reports computing 4/10ths parts per million (or better) accuracy. A participant must submit a minimum of 2 measurements to qualify for this listing. As a matter of interest, the Honor Roll qualifiers averaged 23 measurements per entry for this test.

W1PLJ W1TFS K1VHO WB2CPV/1 WA2VPA W3BFF K3LPP K3WIK WA4BTI K4KA W4NTO WB5CKM W5FMO W5IJW W5OE WA6CKD WB6MZP W8CUJ WA8MSC W9DD W9KO W9MNY W9VOX WØIHI WØMDL Mendenhall.

In the following tabulation error percentage can be determined by moving the parts-per-million decimal point (the figure shown in parentheses) 4 places to the left. Class I OOs must demonstrate an average accuracy of better than 35 parts per million, Class II OOs must show at least 179 ppm.

Better than 35 parts per million

(.5) K2LGJ DJ8WL/W2 WA5ACA K9WGN, (.6) K7CC, (.7) W6AUC K6MZN W6RQ KØSGJ, (.8) WØPHY, (1.0) K5DPG K6DBJ Shari Truess, (1.1) W9JAY WØIBZ, (1.3) K2EK, (1.5) K4LO, (1.9) W9HPG, (2.0) W1DDO W4RHZ K6GZ, (2.6) K5ARH W6CBX WAØTLT, (2.9) K6EC, (3.0) Ireland, (4.1) WA1PLD, (4.2) W8DPW, (4.4) K4SAV, (4.7) W2AIQ, (5.3) K6UK K9BGL, (5.4) K4RTA, (5.5) W4AST, (5.6) W4AU, (6.1) WA1MKP, (6.4) W3KEK, (6.6) K6CL, (7.2) WA2TEI, (7.4) W3YO, (8.2) K7EGA, (8.3) WA4VEC, (8.4) WB2JRX, (9.1) KØTCG, (10.1) VE6MJ, (10.6) W6PZU, (10.7) W4QN, (11.6) W3ADE, (12.1) K2JN, (12.5) WB4KCL, (12.6) K3ENQ, (13.0) WA7HGB, (13.5) WA1MUX, (13.7) WB2EDW, (16.1) WA6OKP, (16.2) WA2PJL WB2VLG, (16.3) K1EPL WØRUR, (16.9) WA5QBO, (17.7) WA5ZBN, (18.4) K4CFV, (19.7) WA3JSZ WA4CTC, (20.0) W2JDC, (20.4) WB6RMG, (22.0) WA9PVS, (23.1) VE3DDD, (23.3) W1AYG, (23.4) WA1RHS WA6WXH, (28.0) K5BSZ, (30.0) W8OW, (31.0) W3GVR, (32.6) W8BU, (34.1) W6AEE, (35.0) K4MZK.

Better than 179 parts per million

(36.2) WA7LKI/5, (37.4) W9IQI, (38.6) Andi Bingham, (42.0) K3CQY, (42.2) WAØYED Perkins, (46.9) VE6XO , (47.4) W8DOP, (49.1) K4TXJ, (51.2) K9WMP, (59.0) WBØHBM, (62.0) WB2ZBI, (63.0) W2WSS, (64.9) Dick Bingham, (66.5) K2QMF, (67.2) W8JZN, (79.5) K8CVJ, (91.4) W6GBF, (99.1) W9UC, (121.8) W1QV, (145.7) W1CSS.

The following entries did not meet the minimum criteria for Class II, in what usually seems to be an obvious error of very large magnitude: WA1RFT, WB2EWH.

Feedback

Sep. FMT, WA1SSH should appear at 3.9 ppm, not 15.6 ppm; W9KO averaged .3 ppm (Honor Roll) rather than the noted .5 ppm; W1DDO made 2.0 ppm, not 19.7 ppm; K2JN should show at 23.5 ppm, not the listed 37.7 ppm; WB4KCL's call was incorrectly shown as WB4CKL. Re the May FMT, K2JN should have been listed at 15.8 ppm, not the reported 5.8 ppm.

Frequency Drift

My receiver is homebrew with a 9 MHz i-f. On 80 meters I phase lock the local oscillator so that the signal at the i-f will be exactly 9 MHz. I then read the local oscillator frequency with a counter. On 40 and 20 the oscillator in the hf converter is phase locked to a multiple of 500 kHz. My standard is a surplus 1 MHz oscillator with a proportional control oven and this controls both phase locked loops and the counter. I enjoyed the comments under "Frequency Drift." – W1PLJ. Used an SB-100 for a rough check, a 2-B for fine measurement, 4 MHz osc., dividers to give markers at 100, 10, 5, 2.5 and 1 kHz, scope, audio osc, and counter. – W1TFS. Worst band conditions since last winter. Was unable to use WWV to set my standard oscillator. Finally used Loran-C on 100 kHz, which is OK, but a little time consuming. Liked the comments about the Sept. FMT, it's nice to see the variety of methods used. – K1VHO. Used HRO receiver, audio osc., 10 kHz multivibrator. – W3BFF. No signals heard on 20 meters either time. Used Heath IB-1102 counter, Apache VFO and HQ-170 receiver. WA4BTI. Equipment a homebrew Macleish type rec/counter tied into my Drake R-4B. – K4KA. "Frequency Drift" made good reading. – W4NTO. My first FMT. Equipment used was an excellent old BC-221, Heath IB-1100 counter, a Heath HW-100 receiver. I ran the signal through the 400 Hz filter and through the RTTY terminal unit and looked at it on the scope. Fed just enough of the 221 into the antenna tuner to give a good beat and read the counter. Tried to take into account position of the 1100 re WWV to bias the measures. – W5OE. Equipment here is a homebuilt standard, Heath IB-1100, SX-88, old-time Heath audio osc. and scope. Standard uses 4 MHz crystal, divided to 1 MHz, then to 100 KHz. From there I can select 10 kHz, 9.09 kHz and 11.11 kHz. – W8CUJ. Liked the resume of comments and methods. We (my 13-year old grandaughter and myself) used all pre-WWII equiment. – Mendenhall ex-7HM. NOTE: signal received via LDE! – K2LGJ. Great fun! - DJ8WL/W2. Equipment used consists of 75A-4, James Knight's FS-1000A frequency standard, HP audio osc., Heath SM-105 counter, Heath O-12 scope, and IC markers at 5 kHz, 6.25 kHz, 10 kHz and 12.5 kHz derived from the FS-1000A which also controls the time base of the SM-105. – K9WGN. Cruddy signals kept this one from being easy. – W6RQ. Early 20 signals stayed good for almost 2 minutes after the start of transmissions then faded to nothing. – K5DPG. Appreciate the new reporting format. – K6DBJ. It was fun but more to learn as I don't know how to calibrate the old LM on WWV yet. – Shari Truess (13 year old grandaughter of ex-7HM). Used an FR-411 freq. meter, R-390 receiver and a scope connected to the i-f output for zero beat indication. – K4LO. Measurements made under very difficult conditions. Demonstrated an FMT during a club meeting! – W9HPG. First attempt, using an SB-301, SB-401, cantenna and Monsanto 100A counter. More participants should load transmitter into dummy load when measuring freq. – K5ARH. New format including comments in Nov. QST is fb. Let's have more.

K6EC. Reception poorest in the past 14 years. A great deal of very rapid QSB on the arly run. In the late run the QSB was less but QRN very bad. – Ireland. Many thanks for the FMT. I just completed my first early run and while waiting for the late run I'm wondering why I haven't heard more about the FMTs. Perhaps an article about the FMT would be of interest. I'd be glad to research an article if it would be of use. – WA1PLD (Sounds good - W1YL.) Got to make that Honor Roll some time! - W8DPW. My gear is an accumulation of over 40 years of interest in frequency measuring. Use a BC-221AK with a built in 100/10 kHz standard in addition to the 1000 kHz crystal a part of the unit. This 10 kHz signal now permits me to reset the zero control to a reference much closer to the unknown frequency and gives an interpolation accurate to at least 100 Hertz or 2 dial divisions. I use this mainly to let me know on which side of the 5 kHz reference I's listening, when interpolating W1AW freq. beat note. Same with the HP 100-IR audio interpolator. I've added an additional panel control in the R/C network to permit resetting the main dial calibration to the nearest 100 Hz increment on the dial. The 100 Hertz reference is an electronically driven Tuning Fork. The 60-Hz line is also used as a reference at the scopes. The WWV 5 MHz fixed freq. receiver gives me a reference for my main standard and of course the info, on WWV gives me references at 1000, 600, 500 and 100 Hz. Regulated power packs and ac line voltage stabilizers help keep out problems during actual measurements. Selectable audio low and high pass filters to the scope plates reject interference from the beat note I want. Another panel contains two 3" scopes and 4-position rotary selector switches in the V and H scope plates permits me to crosscheck all references available. – W2AIQ. New format fb! – K9BGL. Three kinds of QRM, incidental and unintentional, intentional and malicious, participants radiating their carriers. Which is worse? – WA1MKP. I was loaded for bear: BC-221 for zero beat and a freq. counter for the 221. The counter went thataway 2 hours before the FMT! Results based on (!) alone. – WA2TEI. During the early run signals were very weak and noise level high on 80, heavy QRM from carrier(s) on 40 and signals on 20 could just be heard. Late-run conditions were even worse. Signals on 80/40 just above the noise, sounded like aurora short skip on 10 c.w. – K7EGA; Considerable auroral dispersion here in upstate NY. Zero beating very difficult. – WA2PJL. I like the

(Continued on page 168)

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.

ATLANTIC DIVISION

DELAWARE – SCM, Roger E. Cole, W3DKX – SEC: K3KAJ. PAM: WA3DUM. RM: W3EEB. PSHR: WA3DUM 61, K3KAJ 56. The Delmarva ARC is forming in Sussex Co. Contact K3KAJ for details of meeting, time and place. A new repeater of service to many Delaware amateurs is WR3ADY from Cambridge, Md. 146.40-147.00. The Del. ARC new officers are K3HBP, pres.; K3YHR, vice-pres.; WA3BZT, secy. The club which meets 2nd Mon. has an interesting film program and meets on the air on 145.26 (any mode) 9 PM local Thur. Students at out-of-state colleges checking into Del. Nets are WA3UUF/4, U. of Tenn. Knoxville, WA3SKP/2 U. of Rochester, N.Y. and WA3WWU/4 Randolph Macon Academy, Front Royal, Va. We are already getting queries concerning "Ham Campout '75" held in the past at Tuckahoe Acres, Dagsboro. Direct any suggestions or comments to K3YHR or W3ZHF. DTN QNI 373, QTC 111. DEPN QNI 51, traffic 8. Traffic: (Oct.) K3KAJ 119, WA3DUM 108, W3EEB 86, W3DXX 51, WA3GAY 18, WA3QLS 13, K3YHR 4, WA3DUH 2. (Sept.) WA3GAY 21.

EASTERN PENNSYLVANIA – SCM, Allen R. Breiner, W3ZRQ – SEC: W3FBF. RMs: K3DZB, WA3QLG, K3MVO, W3EML. PAM: WA3PZO. Due to ill health W3EML has resigned as Director of TCC Eastern Area. WN3SCC is now General Class and WA3TIU is Advanced Class. WA3CKA received a Certificate of Merit from Penna. Governor for "Agnes" flood work. Wanted, ham with axe. W3EU is troubled with too many trees entwined in his antennas. 3RND director WB2FWW reports progress on the net. New Gear Dept.: To WN3WYI an Eico 723 transmitter. To W3GRE a new contest station. K3BFA has a new formica wrap-around type operating table. WA3VDQ added a long-wire antenna. WA3CFU added an XYL and W3ID added great-grand-daughter No. 1. K3DZB completed a two-element quad. WA3NDQ is working QRP 240 mw on 3.55 MHz and complains of QRN. Pine Grove repeater now has carrier reset timer and plans auto-patch early in 1975. Theory classes at St. Joe's prep school under the direction of WN3SUD show progress. W3WRE received the 1974 "Houck Award" of Telegraphic Communications at the annual Antique Wireless Assn. conference. Between winterizing the tri-bander, W3HMR found time to work the SS contest. CMTN meets nightly at 0001Z on 3720 kHz QNI 250 and QTC 75. PTTN meets nightly at 2330Z on 3610 kHz, QNI 184 and QTC of 82. EPA meets nightly on 3610 kHz at 0001Z, QNI 415 and QTC of 183. Is your station registered with the AREC? If not, look up your EC and get where the action is. You don't know who your EC is? Read on! WA3TBG from Lima is EC for Delaware Co. W3VAP coordinates Scranton-Wilkesbarre. K3KNL is reorganizing Schuylkill Co. area. K3FOB active in the York area. WA3HIT has the Philadelphia area coverage. W3ID has quite a setup in the Montgomery county district. Lower Bucks Co. is being reorganized by EC WA2IWX. WA3KKN is forming plans for the Harrisburg vicinity. WA3QNK has taken over in the Lancaster area. WA3REY reports plenty of activity from the Lebanon area. WA3VUE is organizing AREC in Reading. K3WEB is EC from Cumberland county. W3ZAT Chester Co. and WA3WID Northumberland have just resigned. If your county is not listed and you can fill the spot, write for more details. Traffic: W3CUL 2122, W3VR 637, K3DZB 294, WA3ATQ 248, WA3VDQ 236, W3EML 221, WB2FWW 211, WA3QYY 205, WA3SXU 180, WA3PZO 177, WA3TBG 88, W3ZRQ 78, WA3SVJ 73, W3WRE 66, K3MVO 63, W3IPX 61, W3BNR 51, WA3TVT 48, WA3UKZ 45, WB2RBA 44, W3VA 36, WA3PHQ 28, K3OIO 26, K3BHU 24, W3ID 23, W3ADE 18, WA3HBT 16, WA3SVK 12, WA3CFU 11, W3LC 10, K3UYJ 10, W3VAP 10, WA3TMP 8, WA3NIM 7, W3OY 7, W3AVJ 6, W3CBH 6, W3CTB 2, K3HXS 2, K3KNL 2, WA3NDQ 2, W3OML 2, WA3VUE 2, K3BFA 1, WA3CKA 1, W3EU 1, W3GMK 1, W3GOA 1, W3HMR 1, W3KCM 1, W3KEK 1, WA3QLG 1, WA3REY 1, WN3WYI.

MARYLAND-DISTRICT OF COLUMBIA – SCM, Karl R. Medrow, W3FA – SEC: K3LFD. RM: W3QU. PAM: K3TNM. NCM: WA3RCI. W3BHE wishes to express his thanks for all of the expressions of sympathy extended after the accidental death on Oct. 10 of his son WA3PKS. WA3PKS was EC of Montgomery Co. and he will be missed by all. JA8MWO visited various clubs and the hamfest during his short tour in the Washington area. W3JPT and WA3HRV were hosts. The Gaithersburg Hamfest was a glorious success. WA3SEE had the ARRL table with emphasis on the AREC. K3RUQ reports his repeater WR3ADY carrier access 146.40/147 is in full daily operation. The U of Md club W3EAX has this year's Novice Class better than last. WA1NQG/3 is organizing a club EME effort, and membership is up 30%. Loyola College K3IQG is hyperactive with W3VGV, WA3LPJ, WA3NCI and W3QCN doing the leg work. The Goddard ARC has started Novice and General Classes with WA3TJM and WB2TNC/3 instructing. The club is again geared to help AMSAT launch Oscar 7. W3CDQ was visited by VK3KS and OM VK3XB. W3HVQ is a new Extra Class, congrats. WA3UYF says his major activity is troubleshooting. W3JZY is home after a motor tour in the midwest. WA3LPL is a welcome new NCS on the MDCTN. WA3RVU moved his vertical to a clear spot – look out! K3TNM reports his first Oscar QSO a big thrill. W3FZV had 83 contacts in the CD party. MEPN has directors W3HWZ, K3NCM and WA3PRW newly elected. W3FCS is alternate. W3FA treasurer, and WA3IHW FAR representative. K3LJB, secy.; WA3RCI NCM and W3JNY reporter continue in office. W3ZNW frequents 10, 6 and 2 for AREC/RACES. WN3VGV is murphied and misses his traffic-handling. W3EWP goes to great lengths delivering messages. WA3SJY reports Honduras traffic down to a trickle by mid-month. K3DI sports a new QTH and louder sigs. WA3EOP makes BPL for Oct. K3TNM is QRL mid-week with school. W3FCS keeps odd working hours, but runs the Mon. net with speed and accuracy. WA3GXN has gone south for the winter. The Washington Region PON managed by W3DFW and WA3EOP report 12 sessions, traffic 120 and QNI average of 18.7 meeting nightly except Sun. at 5:15 PM local on 3905 kHz part of the PON system. MDCTN 17/77/15.3 and MEPN 22/87/21.4 with W3LDD topper and W3ADQ, W3DKX and WA3PRW close behind. MDD 56/238/6 with top brass W3QU 117, W3FA 106 and W3FZV 95. WA3IIV is back in Hagerstown. WA3SJS makes it on both modes. Traffic: (Oct.) WA3EOP 438, W3QU 199, W3FA 185, WA3SJY 112, WA3RCI 85, W3FCS 74, W3FZV 69, K3IQG 54, K3TNM 54, K3DI 42, WA3IIV 36, WA3SJS 34, WA3RVU 21, WN3VGV 9, W3EWP 4, WA3ZNW 2. (Sept.) K3IQG 27.

SOUTHERN NEW JERSEY – SCM, Charles E. Travers, W2YPZ – SEC: W2JI. PAMs: WB2FJE, WA2DSA. RM: W2JI.

Net	*Freq.*	*Time(PM)*	*Sess.*	*QNI*	*Tfc.*	*Mgr.*
NJPON	3930	6:00 Su	3	21	9	WB2FJE
NJN Ea	3695	7:00 Dy	31	468	105	WA2DSA
NJN La	3695	10:00 Dy	31	240	108	WA2DSA

WA2TRK informs us he is receiving a grant for a radio astronomy project which is receiving emissions from the planet Jupiter. W2REH is a new ORS appointee. SEC W2JI reports continued encouraging activity in the AREC program. Total membership to date is 68. A recent successful licensee is WA2WXP. Ernie is on a disability pension and with the help of a group of interested hams was successfully schooled. He is enjoying his new rig, a Midland 13 and may be contacted during the day and evening hours on the tepeaters. A recent contact was made with WA2UCY who is connected with the RCA SATCOM Project Office and is very active in NJ RACES, Army MARS and is a member of QCWA. The fraternity is always interested in hearing from recent projects of interest from our affiliated clubs and invite other clubs to enjoy club affiliation and its benefits. Contact your SCM or ARRL directly for info. Traffic: W2JI 39, WB2FJE 25, W2YPZ 14, WB2SFX 8, WA2TRK 7, K2BG 6, W2ORS 2, W2IU 1.

WESTERN NEW YORK – SCM, G.W. Hippisley, K2KIR – Asst. SCM: R.M. Pitzeruse, K2KTK. SEC: W2CFP. For net info, see Nov.

"The world's most advanced amateur radio system"

SB-104 SSB transceiver— a new standard for the industry

A revolutionary "new generation" transceiver. It's completely solid-state and totally broadbanded to eliminate preselector tuning. And the output can be instantly switched from 100 watts to 1 watt. The true digital readout offers resolution down to 100 Hz and outstanding tuning accuracy. Receiver intermodulation distortion has been minimized and there are very few active devices ahead of the highly selective crystal filter. Adjacent channel overload is negligible, yet sensitivity is better than 1 μV (.6 μV typical) and front-end overload is dramatically reduced. The "104" is 12 VDC-powered for mobility and the optional HP-1144 fixed station supply fits inside the SB-604 speaker cabinet. An optional noise blanker can be installed in the "104" and an optional 400 Hz crystal filter improves CW selectivity.

Kit SB-104, 31 lbs., mailable **669.95***
Kit SBA-104-3, 400 Hz CW crystal filter, 1 lb., mailable **34.95***
Kit SBA-104-1, Noise blanker, 1 lb., mailable **24.95***
Kit SBA-104-2, Mobile mount, 6 lbs., mailable **34.95***
Kit HP-1144, Fixed station power supply, 28 lbs., mailable **89.95***

SB-230 — the lowest-cost conduction-cooled linear around

The SB-104's "silent partner." 1200 watts PEP or 1000 watts CW from less than 100 watts drive. It's rated at 400 watts input for slow-scan TV and RTTY. The high-efficiency Eimac 8873 triode is double-shielded to reduce stray RF and a massive heat sink replaces noisy fans and blowers. The "230" assembles in just 15 to 20 hours with no alignment.

Kit SB-230, 40 lbs., mailable **319.95***

SB-634 station console combines 5 convenient accessories

The "634" performs 5 important functions — a 10 minute digital ID timer with visual or visual an audible indicators an RF wattmeter that reads 0 200 or 0-2000 watts with ±10% accuracy, an SWR bridge, a hybrid phone patch that can be used manually or with VOX control, and a 24-hour digital clock that runs independently of all other functions. It's a must for every well equipped station

Kit SB-634, 14 lbs., mailable **179.95**

SB-614 station monitor shows you how clean your signal is

Highly visible 1½ x2" CRT detects problems that can reduce the effectiveness of your signal — non linearity, insufficient or excessive drive, poor carrier or sideband suppression, regeneration, parasitics and CW key clicks. It monitors SSB, CW and AM signals from 80 to 6 meters. Push-pull drive for keystone free trace; automatic sync sweep generator with 3 ranges from 10 Hz to 1 kHz. Can be used as an ordinary oscilloscope from 10 Hz to 50 kHz.

Kit SB-614, 17 lbs., mailable **139.95**

SB-644 remote VFO

Designed exclusively for the SB-104. It provides split transmit and receive control and you aren't frequency-limited in any way — transmit at one end of the band, receive at the other. The "644" even has two crystal positions for fixed-frequency control. The "644" has a linear dial, but the exact frequency is displayed on the "104's" digital readout. The display automatically changes when switching from transmit to receive.

Kit SB-644, 10 lbs., mailable **119.95**

SB-604 station speaker — response-tailored to SSB

Designed to match the SB-104 in styling and performance. The "604" uses a 5x7", 3.2-ohm speaker. And there's room inside for the HP-1144 power supply. With connector cable and plug.

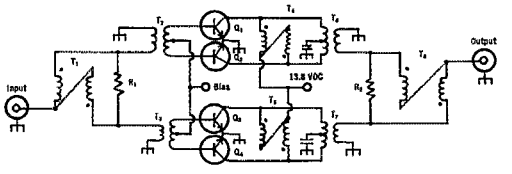
Kit SB-604, 8 lbs., mailable **29.95**

DESIGN NOTES

Mike Elliott
Sr. Design Engineer

Broadband solid-state power amplifier design

Designing a 100 watt output broadband power amplifier that will operate from a 12-volt source requires close attention to impedance matching. It is desirable to use as few devices as possible, to reduce overall complexity. However, high power devices display extremely low input and output impedances which are difficult to match over wide bandwidths. The SB-104's design uses only four transistors to develop 100 watts output across the 3 to 30 MHz range. A simplified schematic diagram is shown below with much of the bypassing and filtering deleted for clarity.



Transistors Q1 and Q2, with transformers T2 and T6 form a straightforward push-pull amplifier. Q3, Q4, T3, and T7 form a second push-pull amplifier. The push-pull configuration is desirable due to the even order harmonic rejection inherent in such an amplifier. In the SB-104, the push-pull amplifiers, combined with an effective low pass filter, reduce all harmonics to at least 45 dB below the 100 watt level.

Transformers T1 and T8 convert the nominal 50 ohm source and load impedances into two 100 ohm ports which are in phase. Any amplitude or phase imbalance causes power to be dumped in R1 or R2, thus assuring equal load sharing between the two push-pull amplifier sections. Similar hybrid transformers feed the supply voltage to the transistors at T4 and T5. Differences in phase or amplitude that would otherwise exist at the collectors are bypassed to ground, resulting in highly balanced output currents in T6 and T7. This technique helps insure excellent second harmonic rejection.

All transformers employ ferrite loading for broad response. In addition, T2, T3, T6 and T7 use brass tubing for the low impedance base and collector windings to minimize high frequency losses. The result is an amplifier which is flat within ±2.5 dB across the 3 to 30 MHz frequency range.

Intermodulation distortion, which results in splatter, has been minimized in the SB-104, and is at least 30 dB below the output carrier level. This is accomplished by careful attention to the selection of device types and operating points. The bias voltage applied to the four power output transistors is fixed, and controlled by a diode mounted on the transistor heat sink. The proper operating point is automatically established in this manner, and thermal runaway is prevented since the bias diode characteristics change with heat sink temperature.

VSWR protection is afforded by a fast-acting ALC circuit. A directional coupler at the transmitter output provides both forward power and VSWR information. The resulting voltage controls the gain of the transmitter, thus controlling power output. In high VSWR environments, the power output is reduced to protect the power amplifier. Typically, a 2:1 VSWR results in a 10% power reduction, and a 3:1 VSWR reduces the output power to approximately 50 watts.

Next month:
Digital frequency readout

'74 column. Net reports: ESS 385 QNI, 95 messages in 31 sessions. PSHR to W2MTA and W2OE. New appointments: WB2IPX as OVS; WB2WPA OVS, OBS; W2EWO EC for Tioga Co. W2CFP received reports from five ECs in both Sept. and Oct. Nov. was auction month in WNY, with Rochester, Ithaca and Syracuse clubs sponsoring. Lots of VHF DX activity lately, with WA2EKN, WB2JRX, WB2WPA, W2RIS, W2RQF, WA2HUP and the Rochester Police Dept. reporting various openings between 6 and 2 meters. K2ZAA and WR2AEI active in the aftermath of the Bushnell's Basin (Rochester) Barge Canal floods Oct. 29. CP 35 to WA2DRC, a Novice license to WN2WVK, and a new General Class license coming to WN2RXL. W2OBB eavesdropping on W2RUF's training net (NYSTN/EANTN) to learn proper net procedure, while W2RUT struggles to get antennas back up (when not raking leaves). WB2IPX now in charge of the Worked All Cayuga Co. award for Auburn ARA, and WA2VCM becomes the new trustee of K2BFB. WB2JRX enjoying a new GLB Channelizer on 2M FM, while making preparations to help the Rochester VHF Group effort in the Jan. VHF SS. Kudos to a fine bunch of bulletins put out in WNY and received here more-or-less regularly: The Hilltopper (edited by W2CFP) with contributions by K2GQU and W2LOG; Auburn ARA (WA2FSJ); Chemung County ARC (WA2DWN); RARA Rag (WA2KND); RAGS Review (WA2PUU); Utica ARC (WA2EXZ); NYS CW (WA2PJL); ESS (K2UIR); Newsletter to WNY ECs (W2CFP); Chenango Valley ARA (WB2YME); and the Chenango Repeater Assn. (also WB2YME) with the continuing saga of the WR2AFA insta2FSU, formerly of Fly Creek is now W1VA in Gilford, NH. Art would like to QSO all his old friends on the Carrier Net, 3935 kHz at 1400Z daily. Traffic: W2RUF 349, W2FR 308, W2OE 236, WB2VND 97, W2MTA 93, WA2KCW 90, WA2HSB 82, WA2TPC 66, W2FZK 52, WB2QIX 48, W2HYM 46, W2RQF 44, K2UIR 37, WA2DRC 31, WA2PUU 31, WA2ICB 24, W2EAF 22, K2KIR 20, WB2KUN 19, WA2TSR 14, K2OFV 11, W2RUT 10, K2IMI 9, WB2JRX 9, WB2QDN 7, WB2CTB 4, WA2EKW 3, WA2LDA 3, W2CFP 2, WA2GLA 2, K2KTK 2.

WESTERN PENNSYLVANIA – SCM, Donald J. Myslewski, K3CHD – PAM: K3ZNP. RMs: W2KAT/3, W3LOS, W3KUN. WPA CW Net meets daily on 3585 kHz at 7:00 PM local time. Pa. Phone Net meets Mon. through Sat. on 3960 kHz at 5:30 PM local time. Keystone Slow Speed Net meets daily on 3709 kHz at 4:30 PM local time. A reminder to those who hold appointments within the WPA Section to check your last endorsement date. Your appointment must be current to be valid. The Crawford ARS currently conducting code and theory classes with 20 prospective hams in attendance. K3ISO reports WR3ACH repeater (.22-.82 Pittsburgh) has increased power input to 50 watts. The Penn State ARC hosted ARRL Communications Mgr. W1NJM who recently visited the campus. WA3YDP has been rather busy experimenting with a homebrew 75-meter mobile antenna. Congrats to WA3SZX on his fine showing in the 1974 Novice Roundup. WA3TMS reports a one way ATV transmission (fast scan 439.25 MHz) was received by K3DMG. Anyone in WPA interested in fast scan ATV should check 28.680 MHz Tue. evenings 9:00 PM. W3KVG spent many long hours monitoring and handling traffic during the Honduran disaster. WA3FTS, WA3UDZ and WA3TVG are engaged in constructing a repeater. Amateurs who live in the Etna area are invited to meet with the Etna ARC every 2nd and 4th Wed. of each month at 7:30 PM at the Perrysville Elementary School. Each month I will endeavor to inform the WPA Section of local area club meetings for those wishing to attend. The Pa. Phone Net had 27 sessions, 631 stations check in, and handled 422 messages. The WPA CW Traffic Net had 31 sessions, 389 stations check in, and handled 223 messages. Congrats to WA3VBM for perfect QNI and W2KAT/3 for BPL. PSHR credits K3CR 53, W2KAT/3 42. Traffic: W2KAT/3 544, K3CR 145, K3CB 115, WA3VBM 88, WA3UJP 70, W3LOS 31, K3SMB 30, K3VQV 28, W3EGJ 26, W3KUN 22, W3IDO 20, WA3IYA 18, K3CHD 13, WA3TGR 5, WA3OKK 4, K3SJN 2, W3ZUH 2.

CENTRAL DIVISION

ILLINOIS – SCM, Edmond A. Metzger, W9RPN – Asst. SCM: Harry J. Studer, W9RYU. SEC: W9AES. PAM: WA9LDC. RM: W9NXG. Cook Co. EC: W9HPGs.

Net	Freq.	*GMT/Days*	*Tfc.*
ILN	3690	2300 Dy	137
ILN	3690	0300 Dy	140
Ill Phone	3915	2245 Dy	415
NCPN	3915	1300 MS	60
NCPN	3915	1800 MS	61
IEN	3940	1400 Su	5

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Chas Gilmore
Product Line Manager
W8IAI

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Place a short wire in the counter input connector and loosely couple this antenna to the transmitter. Use only enough coupling to get a stable reading. The transmitter must *not* be modulated (AM, FM or SSB).

How do I continuously display received frequency?

In short, you can't—a special frequency counter is required. Without such a counter, you can monitor the receiver VFO for "relative" frequency, if all other oscillators are stable and the VFO has a low impedance output.

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Can I measure the frequency of my 2-FM rig? I have a 30 MHz counter.

The simplest solution is to obtain a 150 MHz counter. However, with your 30 MHz counter you can measure a low frequency point in the multiplier chain. Be careful! If you measure too close to the oscillator you can pull it off frequency. Try after the modulator, or preferably after the first multiplier stage. Multiply readings and errors for the correct frequency.

Next roundtable:
Oscilloscope measurements

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AM-306

The North Shore Amateur Radio Assn., The Highland Park High School Amateur Radio Club, and also the Amateur Radio Explorer Post 6 were approved by the League's Executive Committee and were declared duly affiliated societies of ARRL. WA9MZS invites all chess players to tune in the RACPN on 3928 kHz at 6:30 PM CST. The ILN is exploring feasibility of 160-meter alternate frequency when the winter long skip is bad. For information on this contact K9ZTV. Our sympathy to WA9IPZ and WA9OGI on the loss of their mother who recently passed away. W9ZAV has erected a new inverted "V" antenna. WB9NOZ received the 35 wpm code proficiency award. The Peoria repeater's new call is WR9AED. K9FNB, WB9NRX, WB9FKJ and W9PRN are the new officers of the Sangamon Valley Radio Club, Inc. (Springfield). WB9LQC's first son was born on Oct. 12. Our congrats. WA7MAD/9 now employed at WLS/TV in the Sears tower in Chicago. WB9DED vacationing in Nebr. and South Dak. WA9VXX active on Oscar 6 with 34 contacts and 15 states since Sept. and is trying for WAS Oscar. K9ZWU, K9DKI, WA9RIJ, WA9BWB, WA9RER, K9ZWV and B. Thuma were elected the new officers of the Six Meter Club of Chicago, Inc. WØMZL/9 programmed his fast scan television presentation at the last meeting of Northwest Amateur Radio Club. WB9LQC is a newly appointed ORS. WB9KZP is the only BPL recipient for the month. Traffic: (Oct.) K9MWA 466, W9NXG 359, WB9NOZ 247, WB9KZP 224, WA9VGW 153, W9IXV 108, K9ZTV 95, W9ZAV 77, WB9LQC 75, WA9LDC 52, W9OYL 50, WB9DED 41, W9KR 39, WA9ULP 28, W9HOT 19, WA9MZS 12, W9PRN 12, K9DDA 8, W9RYU 6, WB9ELP 5, WB9NMA 3, K9UIY 2, WB9IPX/WB8BPB/9 1. (Sept.) K9DDA 1.

INDIANA – SCM, Michael P. Hunter, WA9EED – SEC: WA9UMH. PAMs: WA9OAD, W9PMT.

Nets	*Freq.*	*GMT/Day*	*QNI*	*QTC*	*Time*	*Mgr.*
IFN	3910	1330,2300 Dy 2130 M-S	3797	469	2781	WA9OAD
QIN	3656	0100,0400 Dy				WB9OMX
IPON	3910	1300,2130 Su	111	12	195	WB9AHJ
EC	3910	2230 1st T				WA9UMH
Hoos.VHF	50.58		494	25	724	W9PMT

It is with regret that we note the passing of the following Silent Keys W9ANH, K9PYN, W9APG. W9CL is a new OO and WA9BIA is new EC for Dearborn Co. WB9OMX has just assumed the reigns of QIN and has the major task of rebuilding ahead of him. How about some help! WN9NBP announces the cw classes of Lake Co. ARC are very successful. W9LT reports an outstanding 1 million plus score in the CQWW phone test. WA9VDJ continues his fine work as OO. Congrats to K9IU and W9LT for fine finishes during Field Day. W9OC registered a 15.3 ppm error in the Sept. FMT (not too bad – any challenges?). WB9BUV at 16.7 ppm and WB9MDB also showed good results. This month I made a solid review of the appointments. As a result of this review, the section now has 82 appointments. This a reduction of nearly 27%. The basic reason for the cut is lack of activity or failure to report activity pertaining to the appointment. Some stations who held one or more appointments will now find that they now hold fewer if any. The rules are simple to follow if you will take the time. ACTIVITY IS A MUST! WN9OFO announces a new net, PIN, on 7120 kHz at 0000Z daily. Traffic: W9EI 353, K9FZX 177, WA9OAD 164, W9FWH 139, W9OLW 97, WB9FOT 96, WB9GIR 78, K9EQT 70, WA9OHX 58, K9PUI 54, WB9OMX 49, WA9UMH 47, WA9OKK 32, K9CBY 30, W9UEM 30, W9DKP 28, K9RWQ 25, WA9TJS 24, W9PMT 21, K9RPZ 20, WB9LDS 19, W9BUQ 18, W9DZC 17, WB9DIX 13, K9IQY 10, W9EGV 9, W9HOF 8, W9MCJ 8, W9OC 7, W9KWB 7, W9RTH 7, W9ENU 6, K9LZN 5, K9DIY 4, W9BDP 2, W9CMT 2, WN9PFZ 1.

WISCONSIN – SCM, Roy A. Pedersen, K9FHI – SEC: K9PKQ. PAMs: K9UTQ, WA9OAY, WA9LRW. RMs: K9KSA, W9MFG, K9LGU, K9GSC, WN9MIW.

Nets	*Freq.*	*Time(Z)/Days*	*QNI*	*QTC*	*Mgr.*
BWN	3985	1245 M-S	446	310	WA9OAY
BEN	3985	1800 Dy	626	157	WA9LRW
WSBN	3985	2330 Dy	1146	360	K9UTQ
WNN	3725	2330 Dy	180	60	WN9MIW
WSSN	3662	0030 MWF	38	3	K9KSA
WIN-E	3662	0100 Dy	285	150	W9MFG
WIN-L	3662	0400 Dy	207	124	K9LGU
WRN	3660	0000 Su	—	—	K9GSC
WIPON	3925	1801 M-F	599	46	WA9NIX

K9PKQ talked with WB9BPS who operated KL7FBI. Skeds are 2400 GMT Wed. and Sat. 14220. BWN, BEN, WSBN certificates endorsed W9AQZ. Winnebago Co. has good net on 2 meters. WB9NKC passed General Class exam. WSBN certificate to K9AAW. WA9GJU OO class 3&4. BEN certificate renewed W9PAS, W9CUA. OPS, OBS, WSBN certificate endorsed W9MMP/9. Regret to report

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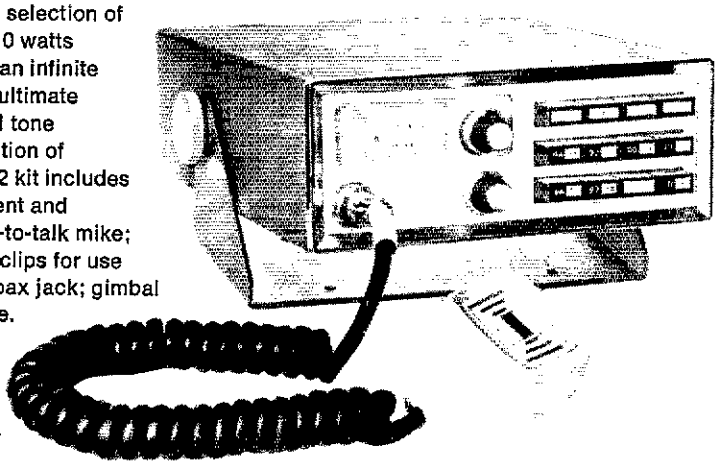

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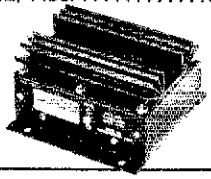

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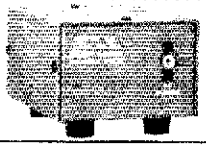

HW-202 SPECIFICATIONS — RECEIVER — Sensitivity: 12 dB SINAD* (or 15 dB of quieting) at .5 μV or less. **Squelch threshold:** 3 μV or less. **Audio output:** 2 W at less than 10% total harmonic distortion (THD). **Operating frequency stability:** Better than ±.0015%. **Image rejection:** Greater than 55 dB. **Spurious rejection:** Greater than 60 dB. **IF rejection:** Greater than 75 dB. **First IF frequency:** 10.7 MHz ±2 kHz. **Second IF frequency:** 455 kHz (adjustable). **Receiver bandwidth:** 22 kHz nominal. **De-emphasis:** −6 dB per octave from 300 to 3000 Hz nominal. **Modulation acceptance:** 7.5 kHz minimum. **TRANSMITTER — Power output:** 10 watts minimum. **Spurious output:** Below −45 dB from carrier. **Stability:** Better than ±.0015%. **Oscillator frequency:** 6 MHz, approximately. **Multiplier factor:** X 24. **Modulation:** Phase, adjustable 0-7.5 kHz, with instantaneous limiting. **Duty cycle:** 100% with ∞ VSWR. **High VSWR shutdown:** None. **GENERAL — Speaker impedance:** 4 ohms. **Operating frequency range:** 143.9 to 148.3 MHz. **Current consumption:** Receiver (squelched): Less than 200 mA. Transmitter: Less than 2.2 amperes. **Operating temperature range:** −10° to 122°F (−30° to +50°C). **Operating voltage range:** 12.6 to 16.0 VDC (13.8 VDC nominal). **Dimensions:** 2¾" H x 8¼" W x 9⅞" D.

*SINAD = $\frac{\text{Signal + noise + distortion}}{\text{Noise + distortion}}$

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500 Transceiver 309
500C Transceiver 329
500CX Transceiver 389
117XC AC supply 85
14-117 DC supply 99
14A DC module 29
14C DC module 39
117X basic AC sup. 65
ICAP audio filter 19
510X MARS osc. 39
160 VFO 75
FP-1 patch 39
WM-1500 Wattmeter 39
600T Transmitter 399

FM-2X 2m FM/AC 199
FM-210A w/AC 249

YEMPO
Tempo One Xcvr $289
AC One AC supply 75
DC-1 DC supply 75

TEN-TEC
KR-20 Keyer $ 45
RX-10 Receiver 49
S-30 Signalizer 29
Triton II Xcvr 489
PM-3 Transceiver 49
PM-3A Transceiver 54

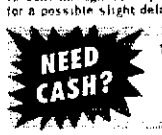
TOP BAND SYSTEMS
TBS-2000 Linear $175

VARITRONICS
FM-208M AC supply w/Amp $ 39

YAESU
FLdx-400 Xmtr $249
FRdx-400 Receiver 219
FL-200B Xmtr 169
FT-101 Xcvr 499

10/28/74

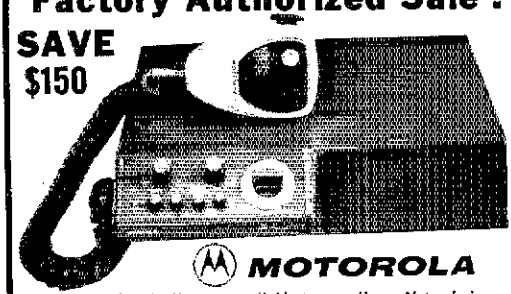
All items subject to prior sale. Amateur Electronic Supply reserves the right to sell such items as power supplies with their matching equipment only, and not separately - depending upon our stock situation. To insure quality, our used gear is sent through our repair shops after we receive your order – so please allow for a possible slight delay (approximately 5 to 10 working days).



We'll buy your ham gear for spot cash. Tell us what you have to sell and we'll rush our offer.

master charge THE INTERBANK CARD

Factory Authorized Sale!



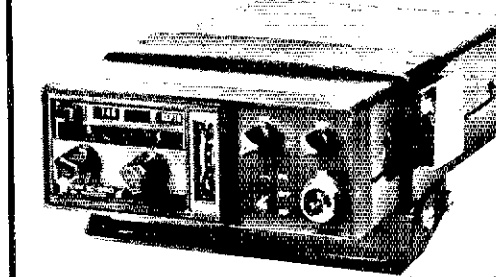
MOTOROLA

To make this Quality unit available to more Hams, Motorola is authorizing (for a limited time) this special SUMMER Sale – Save 30% on 10 or 25 watt Metrum II's.

	reg.	Now
10 watt Metrum II	$399	$279
25 watt Metrum II	499	349

Crystals (one per channel)	9.00	PK-735 Multiple Repeater	
Repeater Offset Crystal	13.50	Offset Modification Kit	39.00
T-1670A AC Power Supply	150.00	PK-736 Tone Encoder Kit	45.00

SAVE $50 ICOM



Purchase a ICOM IC-230 for $489, with No-Trade, and you may take a $50 Credit towards the purchase of other merchandise.

AMATEUR ELECTRONIC SUPPLY

4828 West Fond du Lac Ave. Milwaukee, Wis. 53216

Phone (414) 442-4200

HOURS: Mon & Fri 9-9; Tues, Wed & Thurs 9-5:30; Sat 9-3

IMPORTANT! – Please Be Sure to send all Mail Orders and Inquiries to our Milwaukee store, whose address is shown above. The following Branch stores are set up to handle Walk-in business only.

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621 Commonwealth Ave.; Orlando, Florida Phone (305) 894–3238

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is the Best Place to purchase your new

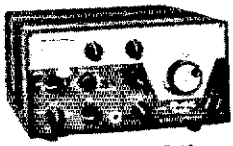
DRAKE *gear for the following reasons*

TR-72 2m FM Xcvr, 12vdc, 23 ch.	$320.00
TR-22C Portable 2m FM Xcvr	229.95
AA-22 Rec./Xmtr. Amplifier	149.95
MMK-22 Mobile Mount	10.00
AA-10 10 watt 2 meter Amplifier	49.95
AC-10 supply for TR-22/AA-10 TR-72	44.95
Extra crystals for TR-22, TR-72 each	5.00
DSR-2 Digitally synthesized Receiver	2750.00
2C	$295.00
2AC Calibrator for 2C	18.75
2CS Speaker for 2C	22.00
2CQ Speaker/Q-multiplier for 2C	49.00
2NB Noise Blanker for 2C	26.95
R-4C Receiver	549.00
4NB Noise Blanker	65.00
Filters: 250, 500 cycle: 1.5, 6.0kHz	50.00
MS-4 Speaker for TR-4C, R-4C, SW-4A	22.00
TR-4C Transceiver for 80-10 Meters	599.95
34PNB Noise Blanker	100.00
RV-4C Remote VFO for TR-4C	110.00
FF-1 Crystal cont. adapt. for TR-4C	46.95
AC-4 AC supply for TR-4C, T-4X	120.00
DC-4 12vdc Supply for TR-4C	135.00
MMK-3 Mobile Mounting kit for TR-4C	6.95
T-4XC SSB Transmitter	580.00
L-4B Linear Amplifier	825.00
MN-4 Antenna Match Network	110.00
MN-2000 Antenna Match Network	200.00
W-4 RF Wattmeter (2-30 Mc)	62.00
WV-4 RF Wattmeter (20-200 Mc)	74.00
C-4 Station Control Console	395.00
SW-4A AM Shortwave Receiver (tube)	335.00
AL-4 Loop Antenna – BC Band	29.00
AN-5 Short Wave outdoor antenna	8.80
TV-42-LP 100w Low-pass Filter	8.95
TV-1000-LP 1000w Low-pass Filter	18.75
TV-300HP High-pass Filter	6.95
Crystals for 2C, R-4C, SW-4A, T-4XC	5.00
Fixed-Frequency Crystals	7.50
SPR-4 Programable Receiver	579.00
ACCESSORIES FOR SPR-4	
5NB Noise Blanker	$ 65.00
DC-PC DC Power Cord	5.00
TA-4 Transceive adaptor for SPR-4	35.00
SCC-4 Crystal Calibrator	20.00
RY-4 Teletype adaptor	13.00
DIAL Crystal Selector - plain	2.75
CRYSTAL KITS FOR SPR-4	
Aeronautical Overseas – 7 crystals	$ 32.00
Amateur Bands – 6 crystals	27.00
Citizens Band – one crystal	5.00
Marine Bands – 11 crystals	49.00
MARS – 5 crystals	22.00
Teletype Commercial – 4 crystals	18.00
Time & Freq. Std, WWV – 5 crystals	22.00
Tropical Broadcast – 3 Crystals	13.50
RP-500 Receiver Protector	90.00

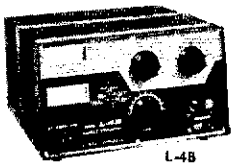
TR-72

TR-22C

Order Today
Direct from this Ad



R-4C



L-4B

your
BANKAMERICARD.
welcome

- **TOP TRADES** for your good clean equipment
- **STAY-ON-THE-AIR PLAN** – Enables you to keep your trade-ins until your new gear arrives – Lose no operating time!
- **PERSONAL SERVICE** from fellow hams who understand your problems.
- **SAME DAY SERVICE** on most Orders and Inquiries from our Centrally Located Modern Facilities
- Top Notch Service Department
- **LARGE COMPLETE STOCK** means Fast Deliveries. United Parcel Service available to most parts of the country. – UPS Blue label (AIR) to the West Coast.
- Credit cards accepted (see coupon below)

SAVE up to $100.

If you purchase any of the new Merchandise listed below at the Regular Price and Without a Trade-in, you may take the "Bonus" Credit indicated below toward the purchase of other merchandise (such as power supplies, antennas, towers, microphones, crystals, linears, accessories, etc.).

TR-22C 2m FM	$20 Bonus	SPR-4 Receiver	$50 Bonus
TR-72 2m FM	$40 Bonus	TR-4C Xcvr	$60 Bonus
R-4C Receiver	$50 Bonus	C-4 Console	$40 Bonus
T-4XC Xmtr	$50 Bonus	L-4B Linear	$100 Bonus

FIVE EZ-WAYS TO PURCHASE
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3. MASTER CHARGE
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5. AMERICAN EXPRESS

master charge
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Mgr. Mail Order Sales

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621 Commonwealth Ave.; Orlando, Florida Phone (305) 894–3238

To: AMATEUR ELECTRONIC SUPPLY
4828 W. Fond du Lac Ave, Milwaukee, Wis. 53216

I am interested in the following new equipment:

I have the following to trade: (what's your deal?)

Ship me:

I Enclose $_____; I will pay balance (if any):
☐ COD (20% Deposit) ☐ American Express
☐ Master Charge* ☐ BankAmericard

Account Number:

Expiration DATE _____ *Master Charge Interbank number _____ (4 digits)

Name:

Address:

City & State:

☐ Send used gear list

W9AVM a Silent Key, also ex-W9HDL. Ground Hog Party a success, 60 present, including W9HPG and his XYL. WIN-E endorsed WB9BRF, Point Radio Amateurs have code classes, regulations and basic theory WN9MBB; WB9LKC classes are free, lasting 2 months. WB9KSK passed General Class. Sorry to hear WB9ESM was in the hospital. WSBN endorsed WB9JSW. K9QXY EC for Dane Co. Received word from ARRL that Sheboygan County DX Assn. is now an ARRL affiliate. WNA picnic 1975 at Oshkosh 2nd Sun. in July. Midwinter Swapfest WARAC Jan. 25, 1975. W5UAU (ex-W9NRP) elected SCM for Ark. BEN certificate to WB9JSW. K9CPM again made BPL, also WA9GJU. Officers for Mancorad club K9LWI, pres.; W9OMO, vice-pres.; WN9OBX, secy.-treas.; K9RFZ, WB9MBZ, K9ERN, board of dir.; WB9DQD, past pres. Traffic: (Oct.) K9CPM 683, WA9GJU 333, W9DND 264, WA9OVT/9 247, K9LGU 172, WB9KPX 169, K9VSO 102, K9FHI 83, WB9JGV 73, WB9NME 72, K9KSA 52, WA9LRW 52, W9MFG 52, WB9ABF 45, W9AYK 40, K9UTQ 39, W9IHW 36, W9KRO 34, WA9OAY 28, K9JPS 25, WA9PKM 24, W9MDU 23, WN9OPI 18, W9BCC 17, WB9LSS 16, WB9LIW 14, W9ZBD 11, WB9HRP 9, K9ANV 8, K9GSC 2. (Sept.) WN9MIW 82.

DAKOTA DIVISION

MINNESOTA – SCM, Tod Olson, WØIYP – SEC: WAØDCJ. RChief RM: KØZXE. Chief PAM: WØIYP (acting in Oct.). Chief OO: WAØPRS. Chief OBS: WBØLOR. The Minn. calling frequency is 3925 kHz. NTS Nets are:

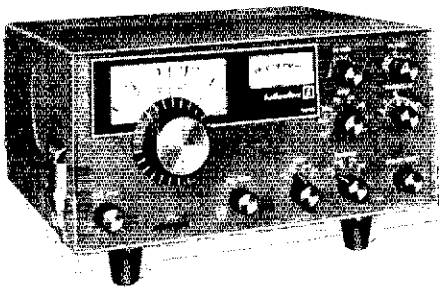
Net	*kHz*	*Time/Day*	*Sess.*	*QNI*	*QTC*	*Mgr.*
MSN-1	3685	6:30 P Dy	25	236	75	KØZXE
MSN-2	3685	10:15 P Dy	27	210	49	WAØYAH
MSPN-noon	3945	12:05 P Dy	31	832	31	KØFLT
MSPN-eve	3925	5:45 P Dy	31	1012	120	WØIYP
PICON	3925	9A-5 P ex-Su	173	3855	235	WAØYVT

In Oct. I had the pleasure of visiting and presenting a program for the Mankato Radio Club. I will be happy to talk to your club if invited. To assist club program chmn. we have set up a speakers bureau – to get info send a letter to me. WØRQJ will be wintering in Ariz. Sorry to report KØDNT's L4B was stolen. WBØLDW passed his Extra, WNØs MOI, MOJ, MOK tried for General together. MOJ received Tech; MOI made General and MOK gets to try again. WØLCO advises that 51 signed up for the St. Paul RC Novice to General Class. New officers of the Arrowhead RC are KØFZG, pres.; WAØLMT, secy.; WAØBJY, treas.; WNØJRC, pro. chmn. and editor of the Over-Mod. WAØVIK received a Public Service award from the St. Louis Park Lions Club for providing communications when they were helping get artificial limbs for a Honduran boy hit by a banana train. (Bob also helped when arrangements were made to move supplies from Minn. to Honduras after the hurricane). WØZHN, WØIYP won the Milliwatt FD trophy for 439 QSOs with 10 watts. Remember the SET is in Jan. Be prepared! Traffic: WBØHOX 573, WØQMY 256, WAØYVT 249, WØZHN 180, KØGNI 119, KØPIZ 108, WAØTFC 83, KØZRD 82, KØCVD 73, WBØFTL 72, KØZXE 71, WØIYP 59, KØCSE 56, WBØCPC 52, KØSRK 46, WAØYAH 46, KØRMX 41, KØFLT 34, WAØVUP 23, WAØIIB 19, KØWXH 17, WAØCCA 16, WBØLDW 16, KØJTW 14, WØHZU 13, WBØCYM 12, WBØDBB 9, WAØWOV 9, KØSXQ 8, WBØGMK 7, WAØJPR 6, WØUMX 5, WAØIAW 3, WBØGMJ 1.

NORTH DAKOTA – SCM: Harold L. Sheets, WØDM – SEC: KØRSA. OBS: KØPVG. RM: WAØMLE. OO: WØBF. WØCDO now home and able to be on the air some. WAØAYL getting settled with new 75-meter antenna. He has a new eleven-element 2-meter beam ready to put up. The Forx ARC received their Repeater license WRØAGR and will soon be on 34-94. WØHJK back on the air in Jamestown, WØAZV is again headed south. WØDM has KØPZW on the air from Valley Jr. High on 40-meter Novice at present and 15 meters soon. WNØKSD active on 15 meters with a Collins rig. KØFRP/Ø has located at Park River for the present after his stint in the Navy. WBØIQK and WBØIHA of Minot AFB getting ready for RTTY. WBØFUO and KØBWN gave a demonstration of Amateur Radio at the Mini Fair held at the High School. The MARC participated in a Goblin Patrol with the police dept. who were quite impressed with the ease and efficiency of the 2m FM which could be set up quickly at the PD headquarters. WØFUO and KØBWN/Ø were invited by the Minot High student body on Mini-course day to teach two, three hour classes on amateur radio. The MARC holds their meetings the 2nd Tue. of the month.

Nets	*kHz*	*CST/Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
Goose River	1990	0900 S	4	56	0	WØCDO
YL WX	3995.0	0730 M-F	9	148	110	WAØRWM

Hallicrafters' all-american made FPM-300, Mark II "Safari" SSB/CW transceiver is Q5... from the Mauritania solar eclipse expeditions to a famous raft adventure in the Atlantic.

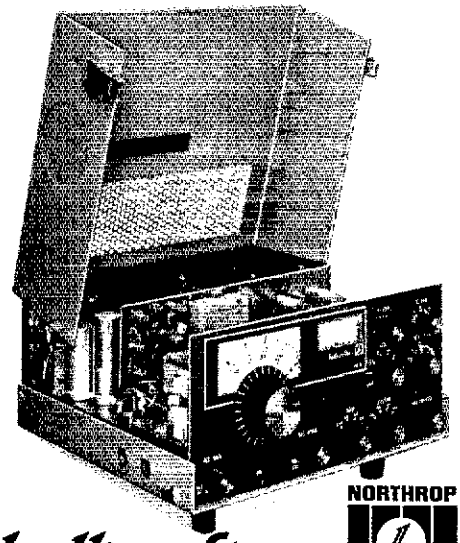


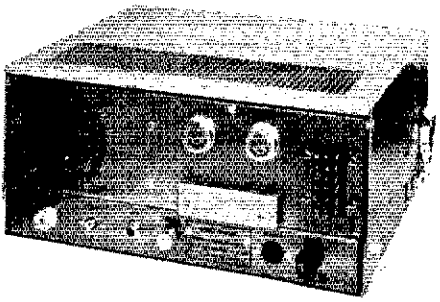
NOW! NEW LOW PRICE ONLY $525

Proven design in the tradition of the HT-37 and solid-state dependability are combined in this compact transceiver featuring state-of-the-art FET's hot carrier diodes and bi-polar transistors for peak, reliable performance.

Some of the high performance specifications:

- Designed for fixed, portable and mobile use
- Equipped with a self-contained Universal AC and DC power supply system
- Compact dimensions (HWD) 5½ x 12 x 11 inches
- Weight: 25 pounds
- Tuning ranges: 8-600 kHz Bands, 80-10 meters
- Built-in speaker
- Power requirements: 117 V or 234 V 50/60 AC: 13.4 VDC negative ground
- Modes: Selectable Upper or Lower Sideband-CW or RTTY
- Type of service: continuous operation with 2-tone S SB-CW-RTTY (50% duty cycle)
- Power Output: 125 Watts P.E.P. (Nominal) into 50 ohms
- Receiver Sensitivity: Less than 1 uV for 15 db SN Ratio
- Selectivity: 2.0 kHz
- Receiver IM: 60 db below 2 equal 10MV signals
- Receiver Image and IF Rejection: Greater than 60 db.
- Internal Receiver Spurious: Less than equivalent 1 Microvolt Signal
- Transmitter IM: 30 db below P.E.P. (26db below one of two equal tones)
- Adjacent Channel Desensitizing: 3 db with greater than 10,000 MV
- Sideband Suppression: -50 db minimum @ 1 kHz
- AF Power Output: 2 watts
- Stability: 100 Hz after warmup. Max. 100 with 10% line voltage change
- Frequency Readout: Within 1 kHz ± 100 kHz of Cal. Point not more than 3 kHz across entire 500 KC Band
- Break-In CW: Semi-Automatic
- CW Sidetone
- Audio Frequency Response: 500-2500 Hz Nominal
- AALC: 12 db Compression
- AGC Figure of Merit: 60 db minimum
- Crystal Calibrator: Provides 25 kHz Calibration Signals
- Optional Accessories: MR-300 Mobile Installation Kit; HA-60 Blower Fan Kit, works on AC or 12VDC





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You should be talking with a Hallicrafters.

NEWS BULLETIN

WE'VE GOT GOOD NEWS FOR YOU!!

DEAR OM

It has oftentimes been said that NO NEWS IS GOOD NEWS or that THERE IS NO NEWS LIKE GOOD NEWS — but if you haven't heard the GOOD NEWS about BURGHARDT AMATEUR CENTER in Watertown, South Dakota — OF ALL PLACES!! — then you don't know WHAT you've been missing — and that could well-be classified as BAD NEWS!!!

To begin with, at BURGHARDT AMATEUR CENTER our whole structure of business is built upon FRIENDSHIP and PERSONAL SERVICE. We do not pretend to be "big operators" as this would defeat our whole purpose in giving you — our customer — the kind of FAST, DEPENDABLE service that you would expect — and you GET — from a company whose reputation as "AMERICA'S MOST RELIABLE AMATEUR RADIO DEALER" is on the line every day of the year.

On the otherhand, we are by no means a small nor inexperienced outfit casually dabbling in the enterprise of selling ham gear. In fact, STAN BURGHARDT, WØIT, has been serving the nation as your DIRECT LINE to every major manufacturer of amateur radio equipment since the fall of 1937—offering his customers the LATEST and BEST in new ham gear from our central location here in the Midwest. Today, we are still handling and STOCKING all of the familiar brand names that are a factor in the amateur market, and we carry a COMPLETE LINE of ACCESSORIES TO FILL VIRTUALLY EVERY HAM NEED But then, WHO DOESN'T??? And, WHAT ELSE IS NEW???

FAST DELIVERY

Others have claimed it — but do you GET it??? We ALWAYS ship your order the SAME day it arrives — unless for some GOOD REASON we are unable to supply the item from stock. Factory Back-Orders in recent months have made it a real problem to keep many of the fast-moving items on hand, but we're doing ALL WE CAN to stay on top of things. In the event of ANY delay — however slight — we will notify you promptly and advise you specifically when we will deliver.

HONEST DEALING

We'll be honest with you right from the start!! We ARE in this business to make a living — but we don't intend to make it at YOUR expense!! Our prices on new and used equipment are "down to earth" and squarely reflect the REALISTIC value of the merchandise. Remember, we're licensed hams ourselves, and if we cannot honestly say that we'd pay so much for any particular item — you won't have to pay that price either. When a trade-in is involved, you'll always get OUR "top dollar" allowance for your gear — we know what used equipment is worth and we'll give you a straight-forward quote at all times. We may be UNDERSOLD, but when you deal with us, YOU will never be OVERSOLD!!

USED EQUIPMENT

Our listing of used equipment is an ACTUAL and FACTUAL listing of items we DO have on hand or have actually dealt for and have coming in REAL SOON. As a rule, nearly every make & model of used gear passes through

Burghardt INC.
AMATEUR CENTER

124 First Ave. N.W. — P.O. Box 73 — Watertown, S.D. 57201

RACES	3996.5	1730 S-S 1830	35	660	90	WBØATI WAØSUF

Traffic: WAØRWM 126, WAØMLE 103, WAØSUF 99, WBØHHC 97, WØWWL 37, WØDM 32, WBØFUO 19, WBØBMG 16, WØHSC 5, WØMXF 2.

SOUTH DAKOTA – SCM, Edward C. Gray, WAØCPX – The 1975 South Dakota Ham Picnic is set for June 14 and 15, at the 4-H Grounds and buildings, Mitchell; and is being sponsored by the Mitchell ARC. The Mithcell ARC and Huron ARC held a joint Christmas party which was planned by the Huron Club. WBØHHM and KØKFC of Sioux Falls and Mitchell respectively had a QSO through Oscar 6. WAØROK now living on the West Coast. WAØTNM has been appointed to the Transcontinental Corps. Many of the S.D. gang is getting on 160 meters using ssb on the high end. Why don't you join them! KØWLU of Brandon reports considerable DX activity on 2-meter ssb with 15 states logged in one evening during Sept. Net reports: Morning Net – 378 QNI and 39 QTC; NJQ Net – 756 QNI and 49 QTC; Early Evening – 832 QNI and 24 QTC; Late Evening 1404 QNI and 43 QTC; SDN CW – 239 QNI and 185 QTC. Traffic: WAØROK 280, WAØTNM 266, WAØUEN 83, WØHOJ 66, WBØIJV 40, WAØVRE 39, WØMZI 24, WBØEVQ 17.

DELTA DIVISION

ARKANSAS – SCM, Sid Pokorny, W5UAU – SEC: W5RXU. PAM: WB5FDP. RM: W5EIJ.

Net	*kHz*	*Time/Day*	*QNI*	*QTC*	*Mgr.*
ARN	3995	0030 Dy	566	38	WB5FDP
OZK	3765	0100 Dy	206	32	W5EIJ
ANN	3715	0130 Dy			WB5IGF
APN	3937	1200 M-S			W5POH
M-Bird	3925	2230 M-F	458	10	
ATN	3995	2330 Dy	373	31	WB5IDRY

New OBS: WB5IGD; OPS: WB5GVE; ORS: WB5IGF; renewed ORS: W5TXA. Silent Key W5AY, our sympathy to his family. OZARC new club at Mtn. Home, W5SRD, pres.; WA5RXY, vice-pres.; WB5DZM, secy.-treas.; W5TDP, trustee. Our sympathy to the family of WB5KRR now a Silent Key. WB5BID holding code class for the blind at Little Rock, if interested call 565-3579. Your SCM would like to bring the Ark. files up to date but need much info, such as radio clubs and officers, appointment renewals and any other news you may have, station activity and net reports by the 4th of month please. WB5FDP made BPL with 104 orig and total 228. Traffic: WB5FDP 228, WB5IGF 51, W5EIJ 36, W5UAU 36, W5TXA 13, WA5TLS 12.

LOUISIANA – SCM, Robert P. Schmidt, W5GHP – Asst. SCM: John Souvestre, WA5NYY. SEC: W5TRI. RM: WA5ZZA. PAM: WB5EKU. VHF PAM: WA5KND. W5GXO in the hospital. New appointments: K5RVU EC for Rapides Parish, replacing WB5IYH, who now is EC for the area. Remember all EC's should send their monthly report to our new SEC W5TRI. Please be prompt with these reports. WB5LBR new OPS, active on LTN and DRN5. ACROS active and planning their 2nd repeater. K5RNM and W5QEP also active on LTN. WA5LGO and XYL WB5NAU hold classes for a group of 10 prespective novices. Congratulations to the Lafayette club on winning the Louisiana Council of ARC's FD award, as well as placing 2nd in class 1A. WA5YOU and XYL WB4BOA moved to Monroe from Ala. Twin Cities ARC had a Halloween Goblin hunt in West Monroe. Congratulations to WA5ZZA on her appointment to the Central Area Staff as CTN asst. mgr. WA5IQU has new 500 watt rig, and is NCS on CTN on Sat. Both WA5ZZA and WA5IQU on 2 meters. K5FVA active on LAN and has received his Section Net Certificate. K5BLV reports decreased activity in Oct. Remember LSN the Slow Speed CW net now meets five days a week on 3703 kHz, at 8:30 PM CST.

Net	*kHz*	*Time(CST)*	*QTC*	*QNI*	*Mgr.*
LAN	3615	7:00&10:00 Dy	157	297	WA5ZZA
LTN	3910	6:45 PM Dy	74	339	WB5EKU
LSN	3703	8:30 PM M-F	37	58	WA5IQU
LRN	3587.5	8:30 PM Su	14	19	W5GHP

Traffic: W5GHP 281, WA5ZZA 226, WA5IQU 223, W5MI 141, WA5PRI 39, WB5JZQ 37, WB5LBR 22, WB5KFA 16, WA5QVN 14, WB5IKT 8.

MISSISSIPPI – SCM, W.L. Appleby, WB5DCY – Asst. SCM: C.E. Gibbs, W5LL. SEC: WB5FXA. Section net participation up over last month and well up over last year. Net Mgrs. WB5BUE, WA5YZW and WB5JBW have really done an FB job. WB5GOI new

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Gulf Coast Shrimp Net Mgr. WB5FML back on the air. Hattiesburg ARC and Miss. Coast ARA have both been Inc. W5WWJ, WB5KXT, WB5KQQ and W5SKB heard on vhf-fm; WR5AGG new call for Hattiesburg ARC Repeater, (22/82). Amateurs desiring appointments as ORS, OPS, OBS, OO, OVS please contact Asst. SCM, Net Mgrs, or myself. Welcome to new Miss. amateurs WN5MYB and WB5ELZ. Miss. freq coord is WA5FIL. I have ARRL Life Membership applications if needed. New or renewed appoints: W5IHD OBS; K5UBL, WB5HPZ EC; WA5BNH OPS; WB5LPM OPS, ORS; WN5MTQ ORS II; K5YTA OPS, ORS; K5KTL, W5QDC, W5OFE, W5MUG, WB5HVY OPSs; WB5FML ORS; W5EDT ORS, OPS; WB5JBW RM. MSBN traffic on the increase. WA5RRE, WA5INV, K5UTH, K5RSE, WN5IJY/5 all active. DX station VP1TL an MSBN regular. The joint meeting of Miss. Coast ARA, Keesler ARC, Jackson Co. ARC & Hattiesburg ARC with ARRL staffer WA1FCM a big success. Don't forget SET this month, participate! WB5HVY now section rep into Daytime RN5. Welcome to WN4HRR/5, WA1GZV/5 and WA5DXI/5 at KAFB; W5UCY now vhf ssb/cw from Pascagoula. WB5KTQ upgraded to Advance. WN5LCC new rig. W5UEP & WB5EHI participated in TV Q&A session. K5YPR now K4KUI in Fla. WA5WRF has Oscar 6 SCC award. W5TIF & W5IIQ worked XE1WS aeronautical mobile region 2 vhf-fm! WA5FMF new SloScan monitor. W5MUG, W5PWW, W5AO, K5RFT, WB5DCY on 160 meters. W5CUU heard on 20. W5TIF & XYL WB5MIP have new vhf-fm antenna. Special call KF5JCF QSL via P.O. Box 711, Pascagoula MS 39567. Old Natchez ARC Repeater licensed as WB5AFZ 31/91. W5RUB reports at least 6 Miss. stations on for Oct. CW-CD. Novice class in progress on the coast. Sta Net Certificates issued to WB5IFM, WN5MDR, WB5IUS, WN5MTQ, WB5JBW, WB5HVY. Certificate of Appreciation to WA5FII for duty as SEC for 25 months. WA5BNH operating RTTY. Novice class planned for Tombigbee ARC area. Vicksburg ARC repeater WR5AFR has gone to 19/79. K5QBU new mobile shack. PSHR to WB5JBW, WB5IUS, WB5HVY, WB5DCY. MSBN mgr. WB5BUE new net rosters. WN5MMW new receiver. WB5MCC sporting new Heath vhf-fm rig. W5IIQ new HT.

Net	*Freq.*	*Time(Z)/Days*	*QNI*	*QTC*	*Mgr.*
MSBN	3987.5	0015 Dy	1027	150	WB5BUE
MSN	3733	0000 MWF	72	32	WB5JBW
MTN	3665	0045 Dy	143	98	WA5YZW
CGCHN	3935	0200 Dy	1672	196	WB5EBE
GCSN	146.52	0200 Th	51	0	WB5GOI

Traffic: WB5JBW 94, W5EDT 90, K5OAF 85, WA5YZW 75, WB5IUS 65, W5WZ 48, WB5DCY 41, WB5HVY 34, W5NCB 27, WN5MTQ 17, WB5BUE 14, WA5JWD 6, WB5FHA 5, WB5LPM 5, W5LL 3, W5QDC 2, WB5EIN 1.

TENNESSEE – SCM, O.D. Keaton, WA4GLS – SEC: WB4DYJ PAM: WB4PRF. RM: WB4NIR.

Net	*Freq.*	*Time(Z)/Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
TPN	3980	1140 M-F	77	3569	164	WA4EWW
		1145 M-F				W4PFP
		2330 Dy				WB4YPO
		1300 SSuH				
TN	3635	2300 Dy				WB4DJU
ETVHFN	50.4	0000 MWF	13	153	0	W4SGI
ETVHFN	145.2	0000 TTh	8	34	0	WR4DZG
ETTMN	28.7	0100 WF	5	106	0	WB4NFI
MTTMN	28.8	0100 TTh	9	41	0	W4EAY
ACARECN	145.28	0100 T				WB4ZSZ
	145.88					
KCARECN	145.52	2230 F	4	31	0	WA4ZBC
FCN	3980	2330 S	4	62	1	WA4ZBC

Some of the OOs are becoming active, would like to see all in this section as active as you can be. The Tenn. Emergency Communications Net has been scheduled to meet on 3980 kHz, each Sun. at 1300Z. This net is to embrace all AREC, RACES, ECs and all amateurs who are interested in emergency communications. Traffic: K4CNY 198, W4OGG 191, WB4DJU 134, K4KCK 75, K4YFC 53, WB4ZSZ 46, WB4YPO 36, W4RUW 34, WB4MPJ 26, WA4ZBC 23, W4CYL 18, WA4GLS 8, WB4DDV 7, K4SJV 6, K4SBV 5.

GREAT LAKES DIVISION

KENTUCKY – SCM, Ted Huddle, W4CID – SEC: WA4GHQ.

Net	*QNI*	*QTC*	*Net*	*QNI*	*QTC*
KRN	336	33	KYN	368	23
MKPN	850	49	KNTN	153	6
KTN	1304	173	WKETN	70	3

WB4ECB now mgr. of the new Western Kentucky Emergency Traffic Net (WKETN). K4TXJ now has his Extra. KYN now has a FB bulletin published by RM K4UNW. Lots of news and good info

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- MAGNUM SIX operates like a "time scavenger". Average power is increased merely by causing transmission to occur at slightly below, but never over, rated values more of the time. By increasing the duty cycle, MAGNUM SIX pushes the average output from 12-15% PEP "way up" to 50-60% PEP. Operationally this is impressive because of the clean 6 db signal strength improvement. Equipment-wise this is roughly equivalent to operating at continuous AM, or a little below continuous keyed CW ratings. Tube lives are thus not shortened below rated values. On the other hand, they'll no longer be "loafing" on SSB either. So why not

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Contact K4UNW to be put on the mailing list or better yet QNI KYN/KSN and you will automatically be on the list. I am receiving some traffic reports too late to make the column. Please remember that latest date is 10th of each month. Traffic: (Oct.) W4BAZ 139, WA4IGS 133, K4UNW 123, WB4WND 88, WB4ECB 81, WB4ZMK/4 73, WB4ZML 64, WA4GHQ 57, K4DZM 56, WB4REN 53, WB4AUN 47, W4CID 45, WB4EOR 45, WB4EXQ 35, WB4WCM 31, WA4FAF 28, WA4VZZ 28, K4TXJ 24, WN4JAV 16, W4CDA 13, K4HOE 10, WN4IKF 9, W4YOK 9, K4AVX 7, W4OYI 7. (Aug.) W4BAZ 148.

MICHIGAN – SCM, Ivory J. Olinghouse, W8ZBT – Asst. SCM: A.L. Baker, W8TZZ. SEC: W8MPD. RMs: W8JYA, W8WVL, W8RTN, K8KMQ, W8GLC, WB8IMI, WB8NII. PAMs: K8GBC, K8LNE, WB8BYB. VHF PAMs: K8AEM, WA8WVV.

Net	Freq.	Time/Days	QNI	Tfc.	Sess.	Mgr.
QMN	3663	0000 Dy	1125	286	93	W8JYA
WSBN	3935	0000 Dy	836	119	31	K8GBC
MACS	3953	1600 Dy	898	287	31	K8LNE
BR/MEN	3930	2230 Dy	907	108	31	WB8BYB
UPEN	3922	2230 Dy	525	33	33	WB8IEH
GLETN	3932	0230 Dy	732	126	31	WB8OBR
Mi.6M	50.7	0000 MS	183	32	22	WA8VXE
MNN	3720	2230 Dy	268	68	30	WB8JAD

SW 2-meter nets as reported by W8CVQ and WA8WVV held 8 sessions with 96 QNI and 3 traffic. K8AEB and K8DPN have joined Silent Keys. W8LSZ will soon be back on the air from Delta Co. At the QMN meeting in Sept. the following were elected: W8JYA, general mgr.; W8UFS, secy.-treas. RMs appointed are WB8IMI, W8RTN, W8GLC. K8KMQ was appointed 8RN liaison. Motor City RC elected WN8NAC, pres.; WA8YPY, secy.; W8FMO, treas.; W8ARH, trustee. SE Mich. ARA elected the following 1975 Board of Directors, WA8SJX, pres.; WB8LJW, vice-pres.; WB8BHW, secy.; W8HID, treas.; K8PJQ, sgt.-at-arms; members WB8PRJ and WA8RQI. WA8SIQ in the hospital recovering from surgery. K8DUG out of the hospital and at home and will soon be back on the air. K8NEY is home and on air. He spent 2 years in Taiwan, 2 years in Japan and 2 years in Romania. W8CRP has retired and moved from Lansing to Long Lake. WN8THL, WN8TGU and WN8TVG are new in Owosso and are on the air with HW-16s. WB8DKQ is net control on the Wolverine SSB net and alternate NC on the Interstate SSB net and still finds time to teach Novice classes. WA8ULG and W8CVQ are making two-way contacts on 1296 MHz with good signals. WA8MOA is receiving 1296 and is working on a transmitter. Wolverine 6-meter net had 4 sessions, 29 QNI for Oct. WB8RAZ is now with WILX TV in Jackson. K8YYE got married and now has time to get on the air. New Milford ARC officers are K8NTK, pres.; WA8TMP, vice-pres.; K8MPV, secy. WB8QPE is Repeater Council chmn. WA8OJI and W8TBP are passing traffic to nearby cities via repeater. W8TXM now a member of the OTC. Traffic: (Oct.) WB8ITF 272, K8DYI 188, WB8JAD 165, WB8FBG 163, W8ZBT 121, W8TZZ 117, WB8NCD 113, W8OW 109, K8LNE 107, W8GLC 92, WB8NII 83, W8NOH 76, WA8WZF 75, W8MO 59, WB8JIX 58, K8WRJ 58, WB8DKQ 57, WB8OBR 53, W8RTN 51, K8CWO 50, K8ZJU 43, K8HGA 40, WB8IMI 35, K8GBC 28, W8VIZ 27, K8JED 25, W8EU 24, WB8FKA 24, WB8BYB 23, WN8RXS 21, W8UFS 19, WB8IFD 18, K8AMU 17, WB8EEU 17, WA8ENW 17, W8IUC 17, WB8DJS 16, W8EOI 16, WA8RXI 15, W8WVL 15, WB8NYQ 14, WB8MKU 12, K8CIP 11, K8GXV 10, W8UOQ 10, WB8APN 9, WA8CUP 9, W8JUP 9, K8JHA 8, K8RNP 8, W8TBP 8, K8AEM 7, W8DCN 7, W8DT 7, WB8GKB 7, W8BEZ 6, K8MJK 6, WA8WVV 6, W8YIQ 6, K8CKD 5, K8SDA 5, WA8UQN 5, WB8ANR 4, WA8GTG 4, WA8KHB 4, K8TIY 4, W8HKL 3, K8PYN 3, W8RNQ 3, K8LJS 2, W8QOM 2, K8WLE 2, WA8OJI 1. (Sept.) W8OW 43, WB8DJS 23, W8UOQ 12, K8AEM 7.

OHIO – SCM, Henry Greeb, W8CHT – SEC: WA8COA. PAMs: W8MOK, WA8VWH. RMs: WB8KKJ, WA8WAK.

Net	Freq.	Time	Sess.	QNI	QTC	Mgr.
OSSBN	3972.5	1530/2100/2345	84	2449	780	W8MOK
BN	3577	2345/0300	62	524	278	WA8WAK
O6MN	50160	0200	31	552	211	WA8VWH
BNR	3605	2300	31	111	205	K8NCV
OSN	3577	2310	29	181	56	WB8KKJ

W8MOK is new OSSBN mgr. and PAM. Let's all support Bob in his new leadership task. Some activity reports are written at an "uninspired" time – the deadline is due, but the inspiration isn't. Thanks to all who report, it makes the task much easier. Fourteen students of the Belmont County Vocational School passed their 5 wpm code class test and took Novice Exams under the supervision of WA8KPN. W8ERD reports Central Ohio AREC has an operational portable repeater on 146.46/147.06 MHz and has tested its

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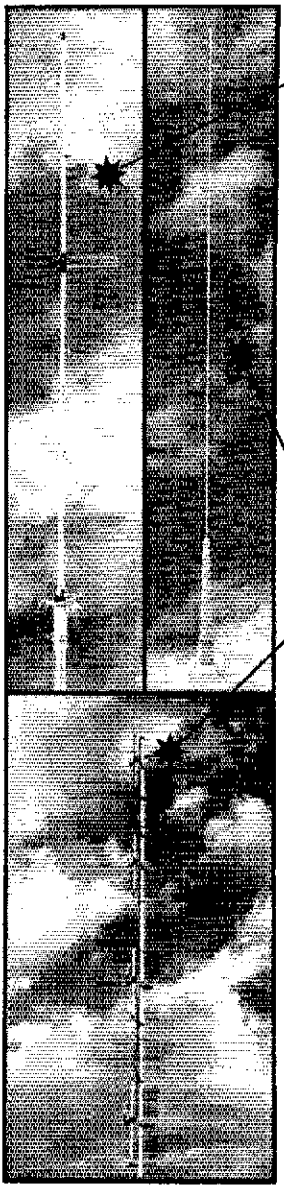

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ARX-2K	Ranger Kit			**$10.95**

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NEW 4 POLE...economically priced for primary repeater or home QTH, this antenna has been proven in hundreds of repeater installations. It is a four dipole gain array for mast or tower mounting. It has sealed coax harness for direct 52 ohm feed.
The antenna can be adjusted for a 180° or 360° radiation pattern. Another unmatched antenna value by Cush Craft.

AFM-4D	1000 watts	146-148	MHz	**$52.50**
AFM-24D	1000 watts	220-225	MHz	**$48.50**
AFM-44D	1000 watts	435-450	MHz	**$46.50**

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utility in several drills. Apricot Net members provided communications for Cleveland's Columbus Day parade. A traffic handling campaign was planned for Thanksgiving. Massillon ARC members helped with "Cyclethon '74" for the Heart Assn. Code theory classes have started in Cincinnati and at Brookhaven High School in Columbus. Are there others? Please advise. Operators of OSU ARC who hold appointments include WB8INY, WB8IBZ, WB8OSC, WB8JXS, WB8FWO. They monitored the Peru CD net during the aftermath of the earthquake. WB8INY has a new vhf-engineering rig on 223.5 MHz. WA8ZAH is experimenting with ATV at W8LT. New officers for Xavier Univ. Radio Club, K8WBL are WB8AXK, pres.; WB8NUT, vice-pres. WA8HGH reports success on 146.52 MHz with Ottawa Co. AREC Net. Traffic: WA8MCR 483, WA8HGH 403, W8PMJ 272, W8MOK 197, WB8KKI 196, W8MGA 149, W8ENI 139, W8IBX 87, WA8VBZ 83, W8PFT 73, W8QCU 73, W8JD 68, WA8DWL 59, W8BHL 57, W8SUS 56, W8DIL 50, WB8OMQ 50, WA8SED 47, WB8LNM 46, WB8MGW 46, WA8VWH 46, WA8YIB 46, W8QZK 44, W8OE 38, WB8CJU 36, WB8KXV 30, K8BYR 27, W8OUU 26, W8WEG 26, W8GOE 25, WB8MRR 25, WA9MWF/8 24, K8VMI 24, W8CHT 23, WA8SSI 21, WB8IGW 17, W8TLC 16, W8ARW 15, K8CKY 13, WB8KQJ 13, K8QYR 13, W8CXM 12, WB8AYC 11, K8JPF 11, WB8KWD 11, WA8MIH 11, WA8MAZ 10, WA8MHO 10, W8PBS 10, WB8QXN 10, W8LT 9, WA8GUG 8, K8DMZ 7, W8DPW 7, WB8IXS 7, K8MLO 7, WB8INY 6, K8UQY 6, WB8GGR 5, K8GRO 3, WA8MGI 1.

HUDSON DIVISION

EASTERN NEW YORK – SCM, Graham G. Berry, K2SJN – Asst. SCM/PAM: Kenneth Kroth, WB2VJB. SEC: W2KGC. RMs: WA2PJL, WB2IXW, WA2FBI and K2DM for RTTY. Nets: NYS 3,675 MHz daily 0001Z and 0300Z; ESS 3,590 MHz daily 2200Z; Novice and Training Net 3,728 MHz Mon.-Fri. 2200Z; RTTY 3,613 MHz daily 2300Z; NYSPT&EN 3,925 MHz daily 2300Z; Hudson Division P/R Net 2nd and 4th Su., 3,925 MHz at 2200Z. Please note that the Novice Net needs new check-ins. Novices and new traffic handlers; most members now have higher tickets and are active on other nets. Recent change to EST has set up QRM problems from other areas, so look for nets to move - or - from listed frequencies a bit. Club notes: Most clubs hold elections soon; make sure SCM gets results for column mention, please. Albany ARA had W1NJM from Hq; Communications Dept. Head talk on "The Way it Used to Be."Schenectady ARA helping again with classes as Niskayuna HS starting Jan. – details from WB2BYO. The Harmonic Hills ARA heard WB2AAQ on EBC "Dream Machine" and their new FBC 144 Jr. Westchester ARA heard W2HCW and VK5ZAD on latest changes in former's antenna farm. Schenectady Auction in Oct. with W2AZH and W2AHC sharing gavel-wielding. Communications Club of New Rochelle heard WISL from Newington on "What's Ahead for VHF." Net reports: NYS totals third quarter QNI 1885, QTC 1143. Manager WA2PJL reports both NCS and 2RN liaison spots open – write him for details. NYSPT&EN 9 month totals QNI 11,121 and QTC 1,653. NYS issued 13 Net Certificates to members with more to come. WA2PJL now has 180W on 2 for Oscar. New Novices in 3 new counties of ENY: WN2s WPF, WIV and WJG. K2AYQ has Saratoga, Warren, Washington Co. AREC "jumping" with Public Service jobs. WA2EAH made 800 mobile contacts in 49 states from 15 scarce counties on recent trip to Carolinas. WA2FBI 4,000 plus QSOs from VP1 and YS1 during recent trip. W2EIV now liaison for Columbia Cy AREC to NYSPT&EN. Reminder: Annual SET in Jan. – contact W2KGC or your County EC for details and come on aboard. Happy New Year to all in Section. Traffic: WA2PJL 336, WB2IXW 103, WB2LNA 99, WB2NKN 91, WB2TGL 81, K2SJN 33, W2SZ 30, WB2VVS 28, K2TTG 21, WB2RUZ 11, WB2ELA 8, WB2VJB 5, W2EIV 4, WB2BXL 3, WA2FBI 3.

NEW YORK CITY - LONG ISLAND – SCM, John H. Smale, WB2CHY – Asst. SCM: Art Malatzky, WB2WFJ. SEC: K2HTX. RM: WB2LZN. PAM: WB2EDW. VHF PAM: WB2RQF. The following are major AREC/RACES nets: Join one.

Bronx	28.64 MHz	50.35 MHz	146.88 fm
Kings	28.64 MHz	50.35 MHz	146.88 fm
Richmond			146.88 fm
New York	29.5 MHz	50.48 MHz	146.88 fm
Queens	29.5 MHz	50.52 MHz	146.20 am
Nassau	28.72 MHz		145.68 am
Suffolk(West)	28.73 MHz(Hunt.)		145.59 am
	28.65 MHz(Smith.)		147.21 am
	28.610 MHz(Babylon)		
Suffolk(East)			146.82 fm

Note: Net times between 2000 and 2100 local, Mon. Also the Ten Meter Internet for Nassau meets on 29.460 at 1930 local, and the

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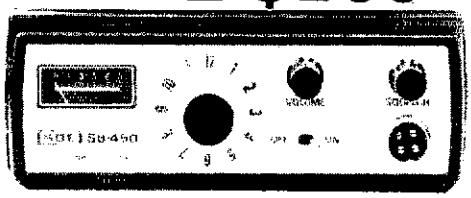

SBE SB-450, UHF FM Xcvr, 5 watt, 12vdc, 12 channels w/xtals for 449.5T/444.5R & 446 MHz simplex. Reg. $399 – Now $299

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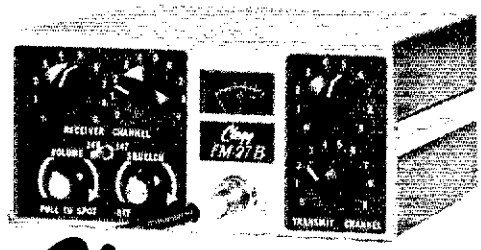

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SR-C12/120-6 AC Charger.....	16.00
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Two Meter Internet for NYC (5 Boros) is on 146.88 at 1900 local with WA2UCP NCS, also we will try to use 29.0 MHz for the section AREC calling freq. This detailed report is published because the SET is at the end of this month (Jan.); I hope that all stations will try to participate. W2GC out of the hospital and doing nicely. Welcome to new Novice WN2NRT, brother of WA2VEN. Following stations participated in Heart Fund Cyclatron: WB2KCT, WB2UZR, WB2BTP, WB2ZZB, WB2CIK; all are members of Larkfield ARC. New officers for W.I.N.: W2FVS, pres.; W1BGD, vice-pres.; WB2RKK, secy.; WB2HJW, treas. WA2NVJ is pres. of R.I.T. station K2GXT. WA2PLI started work on transmatch. WB2FHN made a fine effort in his first CD Party. Tu Boro RC will sponsor 2-meter RTTY contest on 145.620 MHz on Feb. 2, 0600 to 2400 local time, inquiries etc. to Tu Boro RC 149-14 14th Ave., Whitestone, NY 11357. Congratulations to new OPSs WB2NEB and WA2TEI. Radio Society of Greater Brooklyn meets Mon. at 2100 local on 21.430 MHz. Manhattan hams interested in AREC should contact WB2EDW, EC for NYC. Nassau Co. ARC now WB2WWP, for further info contact W2ZVD. WA2ZHA reports that "Operation Communication" auxiliary police day was a success. WB2OYV and WA2KOC finally came in first in a Nassau Bunny Hunt. K2HK moved to Conn. We will miss our umpire for the NLI softball game, but wish Vic all the best. Oct. 7 was the last session of the VHF net due to lack of stations, anyone that can get on 145.8 MHz am and would like to join in, please contact WB2RQF or W2EW. WN2PQE has a new Tempo One. WB2CHY now has tower up at new QTH along with TA33 jr., thanks to WA2VEN, WA2KEC, WB2TSB and WB2KAW. New members Suffolk RC, WA2CXG, pres.; W2QQD, vice-pres.; WA2OQO, rec. secy.; WA2PMB, corr. secy.; WB2TSB, treas. BPL WB2EDW. Traffic: WA2UWA 462, WB2EDW 382, WB2PYM 374, WB2FLF 244, WB2LZN 222, W2EC 196, W2MLC 82, WA2KVH 57, WA2VPA 33, WB2CHY 24, WA2VEN 22, WN2PQE 21, W2EW 19, WA2NVJ 19, WA2JZX 18, WB2WFJ 14, WN2WKH 13, W2HXT 6, K2JFE 5, WA2PLI 5, W2FVS 4, K2HK 4, WA2KXE 4, W2DBQ 3.

NORTHERN NEW JERSEY – SCM, William S. Keller, III, WB2RKK –

Net	*Freq.*	*Time(PM)*	*Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
NJN	3695	7	Dy	31	468	105	WA2DSA
NJN	3695	10	Dy	31	240	108	WA2DSA
NJSN	3730	8:15	Dy	31	254	90	WA2DIW
NJPN	3950	6	Dy	31	524	253	WA2SHT
NJPON	3930	6	Su	3	21	9	WB2FJE
NJPON/VHF PVETN	146.52	10	SuTh	8	–	–	WA2EPI

SEC: WB2PBO. RMs: WA2DIW, WA2DSA, W2ZEP. PAMs: WA2SHT, K2KDQ. New appointments: WB2FIT as ORS, WB2CFB as EC for Somerville and vicinity. Intruder watch report received from WB2TFH. If your report does not appear in this month's column it is because I had to unexpectedly leave the state for three weeks on Nov. 1. It will appear in next month's column. Welcome to WN2OGT, WN2TGS, WN2WCT, new Novices in the Ramsey area. Congrats to WA2DIW and WN2SLA on receiving the CP-25 award, and to WN2UPI on working JA1NHM. WB2NOM is working at WNBC-TV in Washington, DC while attending American Univ. WB2RKK finally has the long-awaited 60-ft. tower, TH-6, and two-element 40-meter wire beam in use. WB2CFB is working on a clock chip. WB2YGK has a new 80-meter dipole/transmatch. WA2GEZ reports hearing the West Coast on 6 meters during the past month, and has been active on the 10 AM Sun. 2-meter SSB net. WN2UPI has formed a ham club at Bridgewater-Raritan HS and is the pres. He also has become involved in forming a local Novice AREC Net. WA2MOL is the father of a new harmonic. K2EK reports the formation of a new night time network 7 PM Tue. on 3880. For information regarding The Simulated Emergency Test this month, contact WB2RKK or WB2PBO. We need all the participation we can get. Appointees: don't forget the CD parties on Jan. 11 and 18; a great chance to work the other appointees and sharpen up your operating. Traffic: WA2DSA 423, WB2RKK 175, WA2PCF 173, WA2BSU 159, K2BHL 136, W2CU 82, WA2DIW 59, WB2FIT 42, WA2OVE 38, W2BLM 34, W2ZEP 22, WA2QJV 18, WB2GAV 16, WA2NPP 13, W2SWE 13, W2CVW 12, WB2VFT 11, WB2QVA 8, WA2CCF 4, WA2SRQ 4, WA2UOO 3, W2WOJ 2, WB2GWB 1, WA2RGV 1, WB2RMK 1.

MIDWEST DIVISION

IOWA – SCM, Max R. Otto, WØLFF – By now everyone's antenna has withstood a couple of ice storms. Creston repeater WRØAGK on 146.19/79 has good range from its location. Congrats

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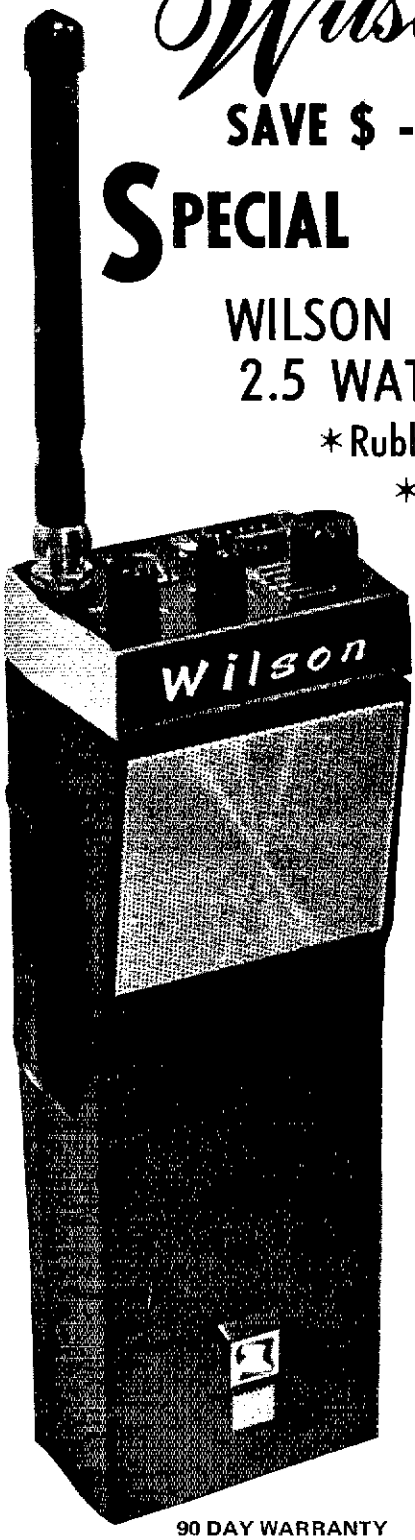

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to WAØACX and WBØJTQ for Advanced tickets. WØHCX is again back on the air. WAØTSP has moved to Lexington, Nebr. as sales engineer for Reach Electronics. WØRJZ cruised in Bermuda and then came home and watched his "ham" friends put his antenna on his new 50-ft. tower. WBØJTQ is new secy.-treas. of SW Radio Assn. WAØTSO moved to Ankeny for College. WBØIZW, KØVQM, WAØVUY, WBØNOO, WBØBPH and WBØFHH used 2M mobile with EC-RO WØLIJ to help look for a lost person in Cedar Rapids. Welcome to the following appointments: WBØAVW PAM; WBØMSX OVS; WØEMA OO; WBØAVW OPS. KØDDA and KØFLY demonstrated AMSAT to Iowa City ARC. WAØVUY, WAØZZG and WBØFNM did a fine job with a Public Service Fair. WØGVU, WAØAUX and WAØDGA helped WBØHOX know Iowa is alive on DTRN. DTRN had 98 messages in 28 sessions for 663 minutes. Cedar Valley ARC is starting their 4th Novice Class. WØJIG will help you get started with MARS. Sour outboard VFOs are keeping OO WAØEFN quite busy logging WAØKHF racked up 241,000 in CARTG. This must be heart attack season – WØWEC, WAØUIT and WØOTP are the latest. All appear to be on the mend along with WØJPI and WAØMIZ.

Net	*Freq.*	*Time*	*QNI*	*QTC*	*Sess.*	*Mgr.*
75 Meter	3970	1830	1343	109	27	WAØVZH
75 Meter	3970	0000	1214	62	27	WAØACX
TLCN	3560	0030/ 0400	276	94	61	KØAZJ

Traffic: (Oct.) WAØAUX 289, KØAZJ 167, KØASR 61, WAØLKM 48, WØLCX 45, WAØVZH 35, WØMOQ 25, WAØTAQ 24, WAØKHF 19, WØLFF 11. (Sept.) WØLCX 42, WBØGUU 34, WØGQ 24, WØMOO 11, WAØTAQ 5. (Aug.) WØGQ 21. (July) WØGQ 16.

KANSAS – SCM, Robert M. Summers, KØBXF – SEC: KØJMF, RM: KØMRL PAMs: WØGCJ, WBØBCL. VHF PAM: 2 MTR WBØEDA, 6 MTR WAØTRO. Net reports for Sept. QKS QNI 424, QTC 173. QKS-SS QNI141, QTC 44. CSTN QNI 753, QTC 42. KPN QNI 145, QTC 5. KSBN QNI 752, QTC 25. KEC QNI 5, QTC 0. KWN QNI 485, QTC 126. MMM had a QNI of 1341 serving 37 mobiles and handling 121 patches calls and or OTC. Still need more monitoring stations some evenings to guard the frequency of 3920 to aid any mobiles needing help. MMM report for Oct. is QNI 1469, 71 mobiles and 121 QTC. KSBN QNI 817, QTC 113. KPN QNI 120, QTC 8. KWN QNI 495, QTC 129. QKS QNI 526, QTC 271. QKS-SS QNI 164, QTC 87. Club elections are upon us – KNRC WØFDJ, pres.; WØDSY, vice-pres.; WBØLPE, secy.; WØWKY, treas.; WØTLG, pro. chmn. Hiawatha ARC WØPB, pres.; WAØUQA, vice-pres.; WAØUCZ, secy.-treas.; WAØSRR, act. mgr. The Sunflower Chapter of QCWA organized in Wichita Oct. 20 elected WØYZB, pres.; WØNEE, secy.-treas.; WØHF, WAØLYX and WØCHJ, dir. WØPB reports the gang in Hiawatha assisted with communications for their Halloween parade. WØINH now back on the air. WBØCUY handling traffic at a booth set up at Hesston College. Our sympathy to the family of WØJX who joined Silent Keys. Traffic: (Oct.) WØINH 287, WØHI 152, WBØHBM 141, WØOYH 104, WØCHJ 98, KØMRI 87, WØGCJ 82, WAØLBB 70, WBØGVR 68, WBØKWI 53, WØMA 50, WBØCZR 47, WØPB 46, KØBXF 42, KØJMF 42, WBØHTF 40, WØOF 33, WØFIR 30, WØBLI 21, WØMCH 20. WAØSEV 11, WAØGSG 7, WØFDJ 6, WØRBO 6, WØNYG 4, WAØOWH 3, WBØKUS 1. (Sept.) WBØHZZ 21, WBØGVR 7, WNØKWJ 7.

MISSSOURI – SCM, B.H. Moschenross, WAØFMD – Asst. SCM: Clifford E. Chamney, KØBIX. New appointments: WBØCKI as OPS and WBØLTD as EC. Endorsements: WBØELJ and KØKUD as ECs; WØUCK as OPS; KØONK as RM.

Net	*QNI*	*QTC*	*Net*	*QNI*	*QTC*
MOSSB	1076	102	MOAREC	36	3
MON	223	141	IC2AN	36	0
MON 2	130	61	WEN	15	0
MSN	69	54	ACE	10	2
PHD	61	9	MEN(Sept.)	581	43
SCEN	45	0			

Congrats to WØGBJ on 50 year ARRL membership. WØFPI is reactivating a club at Ritenour Jr. High under WBØJDQ. St. Louis Repeater Club received new call WRØAGE for their .34/.94 machine. PHD Amateur of The Month was WBØCVG, ex-K7QOO. WAØEMS will be inactive for awhile, he is QRL attending UMKC full time nights. G4CLF visited with local ARNS members in KC. Missouri Repeater Council is operating a crystal bank on a trial basis. HARC picnic at Lake Jacomo attracted nearly 50 attendees. Congrats to new Jefferson Barracks ARC officers: KØBVM, pres.; WAØNOA, vice-pres. KØKWJ and QBØFTR put up new antennas. WBØJWM is a new member on MON. Welcome. Jefferson Barracks ARC annual auction will be held Feb. 21 at the Mosley auditorium. WB8SWL (KØVVH) made a flying visit to Jeff City. I think he is still a Missouri member in spirit. WAØCWH reports clean sweep in the

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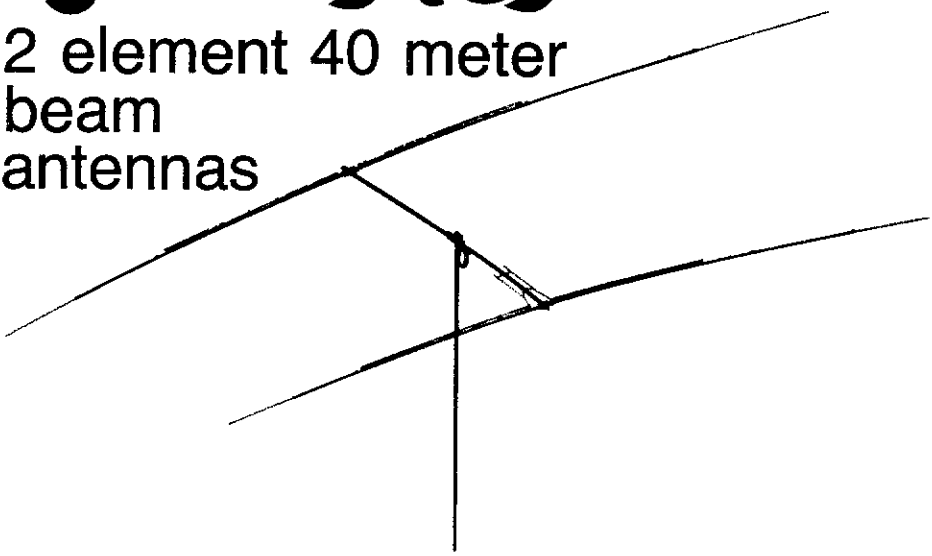

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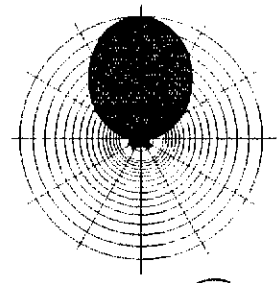

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CW Sweepstakes. Congrats. Traffic: KØONK 895, KØBIX 152, WØBV 152, WØOTF 77, WØOUD 66, WAØFMD 61, WBØHSP 58, WØRTW 57, WBØLMW 33, WØEPI 32, WØGBJ 29, WBØLRX 24, WBØLTD 16, WAØKUH 15, WAØYNC 144, WØBVL 13, WBØCKI 13, WAØFKD 10, KØRWL 9, WBØFKY 5, WBØFQM 4, WAØQOA 4, WØVZK 4.

NEBRASKA – SCM, Dick Dyas, WØJCP – Nebr. was well represented at the recent Midwest Convention in South Sioux City. The 3900 Club is to be congratulated for a fine convention. Everyone had an enjoyable time. The Holdrege Hams have begun code & theory classes. Initial meeting had 23 students. KØMVY and WBØCLP are the instructors. Code & theory classes have begun in Valentine with WAØHQQ and WAØHFH as instructors. The AK-SAR-BEN Radio Club will begin code and theory classes in Jan. 1975. WBØMXO is a new ham in Talmage. WBØFTU has been appointed as OO. WRØAEX is the new repeater call for Hastings. Freq. .22 - .82. QCWA annual meeting held on Dec. 7 at Grand Island. Adequate weather information is beginning to be received by North Platte weather Bureau via amateur nets. The 160-meter net resumed operation on Oct. 31. NEB I&II, QNI 37; NMN QNI 1110, QTC 29; WNN QNI 409, QTC 2; AREC QNI 189, QTC 3; CHN QNI 1147, QTC 51; SHN QNI 250, QTC 7; NAN QNI 350, QTC 9; NSN I&II QNI 2119, QTC 63; Lincoln AREC QNI 275, QTC 10. Traffic: WAØCBJ 32, WØSGA 31, WØHOP 28, WØJCP 16, WØVEA 16, WØVYX 16, WØJDJ 15, WØDMY 14, WØHTA 14, WBØGMQ 13, WAØPCC 13, WØGKK 12, WAØHQQ 12, WAØLOY 12, WØPGF 12, WØNIK 9, WØFQB 8, WBØFRG 7, WØLEJ 7, WØPL 7, WØWKP 6, WØGEQ 5, WØRJA 5, WAØYGZ 5, WBØCNK 4, WAØGHZ 4, WØLJO 4, WØODF 4, WAØOQX 4, WØAFG 3, WAØSCP 3, WØIXB 2, WØLWS 2, KØSEA 2, WØZNI 2, WAØBAL 1, KØSDG 1.

NEW ENGLAND DIVISION

CONNECTICUT – SCM, John McNassor, W1GVT – SEC: W1HHR, RM: K1EIR, PAM: K1YGS, VHF PAM: WA1OYE.

Net	*Freq.*	*Time/Days*	*Sess.*	*QNI*	*QTC*
CN	3640	1900 Dy 2200	62	435	281
CPN	3965	1800 M-S 1000 Su	31	562	227
VHF 2	28/88	2130 Dy	29	274	34

High QNI: CN – WA1RUR, W1CTI, W1KV and WA1SHO. CPN – W1LUH, W1NQO, K1PAD and WA1SHO. SEC W1HHR reminds all clubs: Please have an active EC covering your area – monthly reports are required. Director W1QV appreciates your previous cooperation and requests that you continue to support our new Director, his thanks to all! New officers for Candlewood ARA WA1SCV, pres.; WA1PGC, vice-pres.; WA1OUO, secy.; WA1LKM, treas. ICRC/WR1ABM W1TNS, pres.; WA1OYE, vice-pres. admin.; WA1LMV, tech. vice-pres.; K1THP, secy.; K1YGS, treas.; WA1ELA and W1CNY, dir. Slo Speed MCW Net follows nitely FM2 Net. CSN Bulletin via WA1SHO is FB. Check in at 5:30 PM on 3720, please join! 1RN Mgr. W1QYY mailed Bulletin after nice vacation. Watch Murphy Message for progress report on WR1AEP. W1BDI had short stay in Hospital. With deep regret we add the call of K1PCC to the list of Silent Keys. Congratulations to: WN1UAX and WN1TNR new Novice Class; WN1SUO for General; WA1SHO and WA1RUR High QNI CN and CPN; So. Conn. Amateur Mobile on ARRL affiliation; WA1SSH low power champ 40th DX competition! Make self improvement a New Year's Resolution – complete the ARRL Course in Radio Fundamentals! Sincere thanks to all who made 1974 another wonderful year. The very best to all for 1975 – Happy New Year! Traffic: (Oct.) WA1SHO 310, WA1RYL 273, WA1FCM 211, WA1GFH 186, WA1PHJ 108, WA1RUR 103, W1EEW 95, WA1STN 79, W1CTI 71, WA1QME 60, WN1UAX 60, K1YGS 53, W1KV 50, WA1SQB 33, WA1PPD 31, W1GVT 28, W1DGL 23, W1AW 22, WN1TNR 20, WA1OPB 19, WA1IKN 16, W1QV 15, WA1JCN 9, WA1SWJ/1 8, W1CUH 7, W1BDI 2. (Sept.) WA1GFH 148, WA1PHJ 33, WA1OPB 7.

EASTERN MASSACHUSETTS – SCM, Frank Baker, W1ALP – SEC W1AOG received reports from ECs W1s EQH, FJI, BAB; K1s NFW, ZUP, CCW; WA1s PGY, DXI. New ECs: K1GLB Cohasset, W1GNM Arlington. W1DMS new ORS. W1EJ, W1ZG are Silent Keys. WR1AEM is on 147.96/36. W1UF worked 85 countries on 75 since June. T9 Club met at W1WNK's. Massasoit ARA repeater has solid state receiver. W1HSV now retired. K1OUO back to Fla. WA1PIT XYL of WA1MKP has her Extra Class. WA1ROG pres. of Burlington HS ARC looking for donations. The 4 PMrs had their 4th anniversary with 87 QNIs. WA1UCS new YL in Peabody. K1DVX

helping W1EQH in forming their AREC. W6FZJ/1 worked WØYZS, KØTLM on 432. W1EIH has new Drake T4XC. W1DMH passed Extra Class, in cw nets. WA1PQY was base NCS for Wellesley Veterans Day Parade. W1UX retired from G.R., now in a drug store, will be mgr. of Clearing House Net on Jan. 1. WA1SJR NCS on 1RN. W1KKD new net mgr. for New England Emergency Phone Net. Endorsements: WA1SJR as ORS; WA1OLV EC. WA1QJU has a new Heath swr bridge. W1DMS doing traffic & phone patching. WA1PWY active in Frankfurt, Germany as DA2LC. WA1TEH says the Dorchester ARC is growing. WA1TCS has HW-101. K1YTC mobile on SB-102. WN1TCM has new vertical. ON6NW in Cambridge and a visiting scholar at Harvard Graduate School of Business Adm., for about 1 year. JA8MWO in Lynn for 3 weeks, visiting local hams. WA1RGA on 160. WA1JUY new tower, getting ready for Oscar 7 work. Write to W1DKD for details on Mass. Bicentennial Award from Jan. 1 '75 to Dec. 31 '76. K1MYL now in Westport, and the AREC will have HR2B and eleven-element beam. WA1MXV has tower & quad up. WR1ADR has 100-ft. tower at club QTH. WR1ABS/K1MYL now in Westport on 450 MHz. WA1QDR/1 got married and in Middletown, RI. WA1LBG/1 NCS for AREC Net. K1AHA put Ringo up to 50-ft. WA1SDZ has Advanced Class license. WN1RTQ back from Calif. WR1ABP covering quite an area with antenna raised 40-ft. and an amplifier added. South Shore ARC had films by W1SM & W1BTL. W1HFR new call of W6JQE/1. W1BB sent out his 160 meter DX Bulletin. K1ABR & K1PNJ spoke at the Massasoit ARA bout the R.I. repeater, and an auction was held. W1DL gave a talk on antennas & feedlines at the Framingham RC. Chelmsford ARA had a Hallowenn Party. K1CKS has new GLB synthesizer for 2.

Net	*Freq.*	*Time/Days*	*QNI*	*QTC*	*Mgr.*
NEEPN	3945	0830 Su	96	7	K1EPL
EM2MN	145.8	2000 M-F	97	33	K1IFE
NENN*	3720	1830 MWF	95	34	K1PNB
EMRI	3660	1900/2200 Dy	571	360	WA1MSK

*Sept. W1WUL has new TR 22C. W1NOG is a new FMer. Medford CD has 2-meter fm units says W1AOG. 1200 RC had an auction. WN1TQQ passed his General. WA1PLK has a long wire for 80. W1HRL has retired. Massasoit & Whitman ARAs had a nice banquet at Ridders. Middlesex ARA had a talk on "Microwave Systems" by Mr. Grindell of N.E. Tel. Traffic: (Oct.) W1QYY 237, WA1MSK 209, WA1QKD 207, WA1QJU 169, W1EIH 128, W1OJM 122, WN1RFD 75, W1CE 60, W1DMH 49, WA1PQY 38, WA1MHJ 33, WA1OWQ 32, W1UX 28, WA1IFE 26, W1AOG 21, WA1RGA 16, WA1SJR 16, W1ABC 13, W1PEX 13, WA1JUY 10, K1EPL 8, K1FFX 8, W1PL 7, W1ATX 4, K1LCQ 4, W1NF 1. (Sept.) WA1QJU 173, W1OJM 142, W1DMS 59.

MAINE – SCM, Peter E. Sterling, K1TEV – SEC: K1CLF. PAM: K1GUP. RM: K1MZB. The Barnyard Net held a luncheon at the Marshview Restaurant on R. 1 on Oct. 26 with 54 attending. A good time was had by all. K1RQE has returned from trip to Bermuda. The Yankee Repeater Assn. held a meeting at the Computor Service Center in Augusta. The Pine Tree Repeater Club is soon going to have another repeater, different frequency. K1BAZ has returned to DUI-Land. W1LZT recouperating from an injury received from falling off garage roof while putting up a ringo. K1TEV worked K6ATV, ex-W1BCD in SS. K6ATV is the son of W1BCB. Sorry to report the passing of W1ZO, he also was W2BA. The Northeast Area Barnyard Net reports 859 check-ins, for Oct. We have been experiencing some temperature inversions on 2-meter fm, the band has been in FB shape for DXing thru different repeaters. W1QQY worked K4CAW/4 on 2-meter fm thru Cranston, RI repeater. W1BJG still off the air. New hams in Maine are WN1UBS, WA1UCR, WN1UCP, WN1UDP. Congrats fellows. Traffic: K1MZB 60, WA1HOG 41, K4BSS/1 28, K1TEV 17, W1OTQ 4, WA1MUX 3.

NEW HAMPSHIRE – SCM, Robert C. Mitchell, W1SWX – SEC: K1RSC. PAM: K1YSD. RM: W1UBG. More new hams and welcome to WA1UBC, WN1UBW, WA1UBJ, WN1UCF, WN1UCH, WA1UCE, WN1UDC and WA1UCI. The NHVT Net report from W1UBG shows 144 check-ins, 105 traffic in 27 sessions. The top 3 check-ins were WA1TXI, W1UBG with WA1ODG and K1BCS in 3rd place. W1BYS off to Fla. to work all those repeaters en route. W1LB out of the hospital and back on 40 meters. WA1JSD has been active in the recent 10-meter openings. Dave also reminds us to check into the Derry CD Net, Tue. at 7 PM local time on 28,740. K1YSD recovering from an auto accident and again active. WA1TIQ of The Granite State ARA welcomes calls to 424-4027 after 5 PM regarding joining and club activities. It is my sad duty to report the passing of W1AJD Nashua. Thanks to K1CKD for this info. Effective Nov. 1 WA1GCE will again be your RM. My thanks to W1UBG for an excellent job these past years. WA1FSZ is trustee of the UNH Radio

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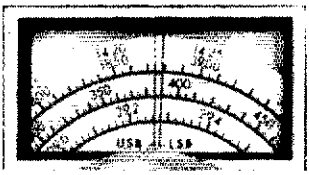

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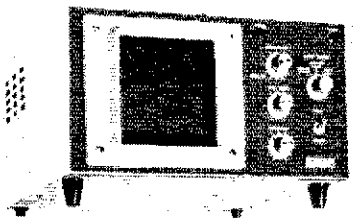

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Club W1ASZ, KL7HRK (WA1JTM) reports from Alaska he will be there another year. Traffic: W1UBG 153, WA1GCE 47, W1MHX 3, W1DXB 2, W1SWX 1.

RHODE ISLAND – SCM, John E. Johnson, K1AAV – SEC: W1YNE. RM: WA1POJ. PAM: WA1RFT. New Novice WN1UBV, new Tech WA1UDQ, new General WA1UCC and new Advanced WA1UDK. The members of the Newport County RC recently provided communications for the Newport Chapter Red Cross for a March of Dimes Walkathon. Mobiles were W1s PLD, JFF, AGB; WA1s PZC, AUL, EXU. Fixed stations W1GHH and WA1CSO. Assisting were Fred Carr and WN1SXK. They operated on 146.94 fm and covered all of Aquidneck Island. WA1PZC has been selected chmn. for a club sponsored two repeater station for Aquidneck Island. A site has been selected and members of the club approved the project. WN1UEJ is the club's new Novice member. Traffic: WA1POJ 330, WA1RFT 2.

VERMONT – SCM, James H. Vicle, W1BRG – SEC: W1VSA.

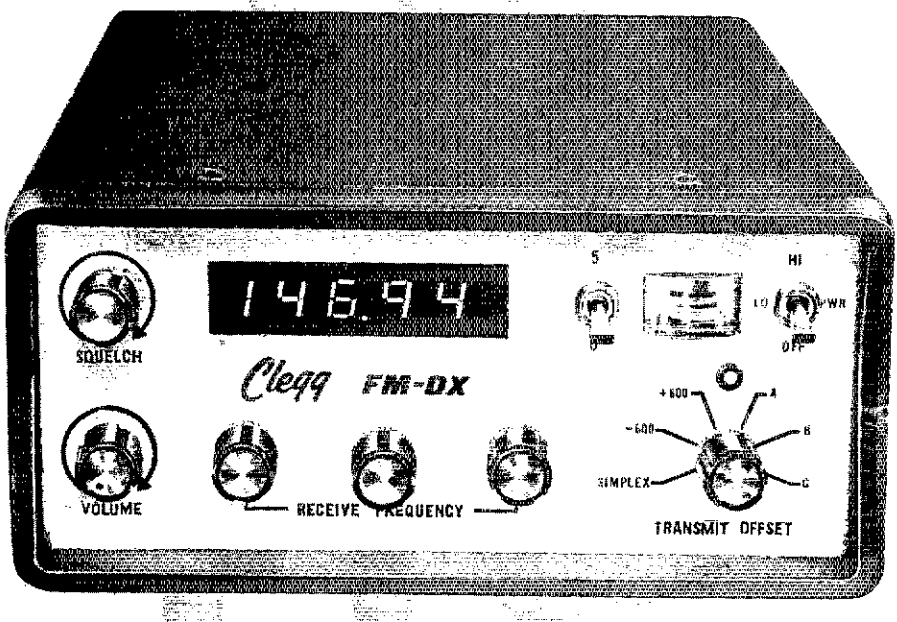
Net	Freq.	Time(Z)/Day	QNI	QTC	Mgr.
VTSB	3909	2300 M-S 1230 Su	771	164	WA1PSK
Carrier	3935	1400 M-S	427	10	W2DSK
Green Mt.	3932	2230 M-S	466	36	W1JLZ
Vt. Phone	3932	1330 Su	66	4	W1KKM
VTRFD	3909	2300 Su	92	26	K1BQB

W1KKD, Enosburg Falls is new Net Mgr. for New England EPN which meets Sun. at 1330(Z). BARC has more than sixty students in its code and theory class. QSO Party 2100(Z) Feb. 22 to 0100(Z) Feb. 24. K1PEB has moved into new home in Grand Isle and is now a base station in that rare county. WR2ADL Mon. night Emergency Net has been inc. in to AREC. VE2TA has moved to 146.19-146.79. Traffic: K1BQB 101, WA1TXI 29, W1LMO 88.

WESTERN MASSACHUSETTS – SCM, Percy C. Noble, W1BVR – SEC: WA1DNB. CW RM: W1DVW. Acting 75 mtr. PAM: WA1MJE. VHF/UHF PAM: W1KZS. WMEN held 4 sessions with QNI 65, traffic 7. West Mass. Rptr. Assn. AREC net held 23 sessions with total of 26 different stations and traffic 9. New Franklin Co. AREC members: W1TZZ, WA1SXZ, WA1SNX, WA1FBI, K1FXX, K1NSU, WN1TYY. New Hampden Co. AREC members: K1IQA, W1GZN. WMN held 31 sessions with QNI 210, traffic 151. WMPN held 23 sessions with QNI 270, traffic 39 (number of different stations 66!) WMPN maintaining liaison with the daytime First Region net 100% (WMN is doing the same on the evening 1RN). The Sun. AREC net on Repeater K1FFK held 4 sessions with average attendance of approximately 15. WA1FBE has requalified for OO Class L. WA1BXP and WB4JSF/1 operated a ham station at a church Harvest Fair. WA1RWU working 10-meter DX with new beam. WA1LNF a new HW-202. CMARA reports K1WUK speaker of the month. The club is running a novice course. HCRA reports 100 people showed up for the auction. WA1SOF now a General. MARC says K1AVO moved to Ariz. W1UD has a CX-7A transceiver. Mt. T ARA says speaker of the month was K1ZGB. New members K2AUO, K1UQB, K1BXE, WA1MPG, K1CRJ, K1NBS, K1CBJ, K1FTY, W1QVL, K1MOU, WA1THR, WA1SXV. WA6KLC/1, WA1KFE. A Conn. RACES group was in operation at the Eastern States Exposition. Over 600 ARRL pamphlets were distributed. Several emergency reports were handled by club members. NOBARC reports W1DGL the speaker of the month. V of L says U. of M. club news now being included in their bulletin. Traffic: (Oct.) W1TM 113, W1DVW 101, W1BVR 86, W1PUO 59, W1ZPB 59, WN1RSY 53, W1KK 44, WA1MJE 41, WA1FBE 38, WA1RWU 36, W1HH 26, WA1BXP/1 18, WA1DNB 11, K1RGO 11, WA1LNF 6, WA1OUZ 5, WA1OLK 3. (Sept.) WA1RWU 42.

NORTHWESTERN DIVISION

ALASKA – SCM, Roy Davie, KL7CUK – The Fairbanks gang reports new officers for the Arctic ARC are KL7CFX, pres.; KL7HLX, secy.; KL7HMU, vice-pres.; KL7AZJ, treas. The club has a nice paper called Short Circuit. They are conducting Novice and General classes on the campus of the Univ. of Alaska. KL7EVO sends code practice on 3735 kHz every Mon., Wed. and Fri. at 8:00 PM AST. KL7FSE transmits Official Bulletins. KL7HDX busy flying, but getting all his licenses upgraded. KL7IAS active on 75 and 20 with traffic. She also manned the police hq. 2-meter rig during the Jr. HS Walkathon as a public service. Others participating on the 2-meter net were KL7HNH, KL7EQ, KL7BDC, KL7JDO. KL7JDO very busy with some TVI/RFI problem solving for some of the gang in Kodiak. KL7GCH lost his antenna in a heavy snow and



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wind storm. The SCM visit to Kodiak was very enjoyable. KL7HOV returned from the hospital in Seattle. KL7HMN active on all bands. KL7DG working his little QRP rig with 4.82 watts on 7070 kHz. The Snipers Net had 31 sessions, 544 check-ins, 46 patches, 44 informals, 6 OBS and 1 routine for the month. WA8ZDE/KL7 at Elelson AFB reports he is having trouble on 75 from TV sweep. The 146.16 - 146.76 repeater off the air. Glad to see KL7RZO and his XYL back for a visit. Traffic: (Oct.) KL7GCH 20, KL7CUK 17, KL7JDO 17, KL7HDX 4, WA8ZDE/KL7 3, KL7IAS 2, KL7HMU 1. (Sept.) KL7GCH 17.

IDAHO – SCM, Dale A. Brock, WA7EWV – SEC: W7JMH. PAM: WA7HOS. VHF PAM: WA7FSI.

Net	*Freq.*	*Time/Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
FARM	3.935	0200 Dy	31	1032	26	WA7RQI
IMN	3.582	0300 M-F	23	105	45	W7GHT
RACES	3.990	1415 M-F	23	846	7	K7UBC
Id Silver	3.93	0130 MWF				W7IY

WA7CTS has received his Advanced Class license. W7UQ, U of I, reports their Oscar equipment has been returned to AMSAT. K7NDX says the Whiskey Butte repeater 34/76 will soon be 16/76. Urgently needed in Idaho are Emergency Coordinators for many Counties. Do we have any volunteers? Traffic: W7GHT 233, K7NHV 10, W7IUO 9, W7KDB 6, W7FIS 2.

MONTANA – SCM, Harry A. Rovlance, W7RZY – SEC: WA7IZR. PAM: WA7PZO. Butte is going to have an officer installation party on Jan. 18. WR7ABY is to have a new home and the club is building the vault with the move planned for spring. WR7ADY is back on with the new repeater. Two new calls for Missoula are WA6FTB and his dad WN7ZOO. Mike is in the Navy in San Diego and his first contact was with a Billings ham working WA6EFC. Wondering if WN7ZOO's antenna is made out of trolley wire? Confess Chuck! W7MKE and WA7HAG have left with the snow birds and will return in the spring. Knight Student Radio Club meeting again with the school year starting. WA7FTD was reelected as pres.; WA7FTG, vice-pres.; WN7YER secy.-treas. W7LR has 121 countries confirmed. K7MNZ worked more DX on RTTY in the contest. IMN net had 23 sessions, 45 traffic and 105 check-ins. MTN had 898 check-ins, 23 sessions and 23 pieces of traffic. How about a few reports out of you league appointees? WA7IZR would like to hear from the EC's and lets have a little activity in that line. Traffic: WA7KMP 34, WA7PZO 15, W7NEG 14, WA7IZR 9.

OREGON – SCM, L.R. Perkins, WA7KIU – SEC: W7HLF. PAM: K7RQZ. RM: K7OUF.

Net	*Freq.*	*Time*	*QNI*	*QTC*	*Sess.*	*Mgr.*
OSN	3585	0245	152	104	31	K7OUF
BSN	3908	0130	705	65	39	WA7SSO
AREC	3993	0300	473	2	31*	WA7RWM
Nuclear	50.250	23			6	W7FFE

33 Counties. Congratulations to OSU ARC who now are officially an ARRL affiliate. Club station, K7UYX, has a new SB-101, with a tower and a tri-band beam. This station has been acquired through the efforts of the club without the assistance of public funding. Congrats also to WA7ZTD, K7DUF, W7TML new OOs; WA7TXV and K7QFG OBSs. Time now for a few words on the SET. Get your club, friends, etc, to participate this year. Also, how about getting some of the two meter gang to join in? Part 97.1 applies to VHF also. K7OUF sends a short note concerning OSN each month. Please accept my apologies for not getting last months report filed. On Oct. 12 I received word my mother had passed away unexpectedly and upon returning to Eugene it was too late to get the report mailed. Traffic: (Oct.) K7QFG 164, K7OUF 152, K7NTS 132, W7ZB 57, WA7QDC 49, WA7SSO 49, WA7UJO 45, W7DAN 34, K7IWD 16, W7LT 14, K7AH 6. (Sept.) K7IFG 359, K7OUF 158, K7NTS 138, W7DAN 130, W7ZB 46, WA7UJO 37, WA7QDC 35, WA7TXV 29, W7LT 13, K7AH 8, W7FFE 3.

WASHINGTON – SCM, Mary E. Lewis, W7QGP – SEC: W7IEU. RM: W7JWJ. PAM: W7PWP. VHF PAMs: K7BBO, K7LRD.

Nets	*Freq.*	*Time*	*QNI*	*QNT*	*Sess.*	*Mgr.*
WSN	3590	1845	332	170	31	K7OZA
NSN	3700	0300Z	412	123	31	WA7NIE
NWSSB	3945	1830	816	29	31	K7OUV
NTN	3970	1130	1433	64	31	W7PWE
WARTS	3970	1800	2260	289	31	W7QG

The holiday season treated some of you well by the additional calls heard on 2-meter repeaters and other bands. Remember the Amateur's Code, now cw, with more fellow ops it is essential we try to follow it. The Amateur's Code is on page 6 ARRL Handbook. Ope

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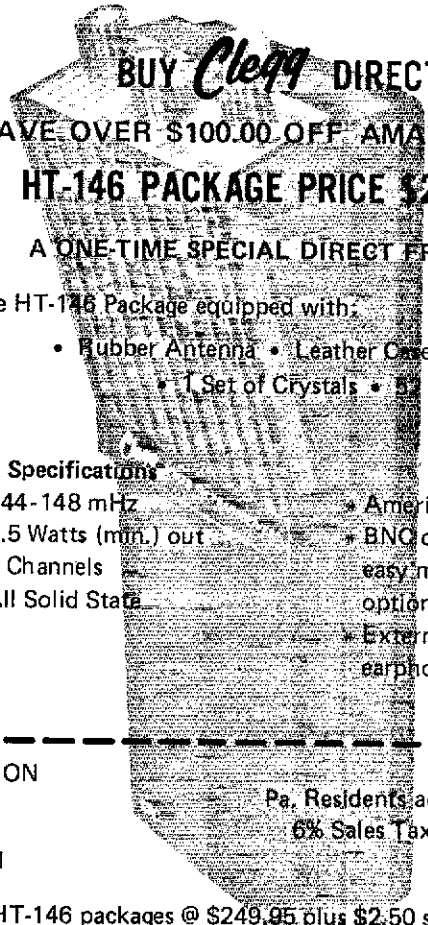

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2-meter repeater pair freq. in Wash. are 146.01/61, 04/64, 07/67 13/73, 16/76, 19/79, 22/82, 28/88, 31/91, 34/94, 37/97 147.66/06, 78/18, no tone access repeaters except autopatch 146.31/91, 147.84/24, and 90/30 with 25 2-meter repeaters in Wash. All traffic nets have advanced beginning time 1/2 hour, and still working against long skip conditions. Nets will return to regular time in the spring as in past years. K7EFB has a new cubical quad three band dish type. K7BBO and others have 432 kHz gear re checked and new antennas installed for Oscar 7. WR7ACA 28/88' diversity receivers are adjusted for 5 kHz deviation with other re peaters doing same. Check your receivers and watch your level o modulation. WR7ACS Cougar Mt. 1800 access 147.81/21 Nov. 1 '74. Sotry to report K7TCY became a Silent Key. Traffic: (Oct. WA7OCV 119, WA7BDD 70, W7PI 68, K7OZA 65, W7LG 50 K7CTP 49, W7APS 41, W7BUN 41, K7OXL 40, W7PWP 37, W7BC 36, W7SYS 33, W7AXT 28, K7ZVA 25, WA7RCR 22, WA7VMC 20, W7IEU 17, W7AIB 12, K7EFB 4, K7VNI 4, WA7GVB 3. (Sept. K7VNI 6.

PACIFIC DIVISION

EAST BAY – SCM, Charles R. Breeding, K6UWR – Asst. SCM Ronald Martin, W6ZF. SEC: WB6RPK. Asst. SEC: WB6DSL. I ar pleased to announce WA6YCE has taken on the duties as PAM an W6EZF has become the EC for Alameda Co. Congrats to both. O behalf of the Section may I thank the Greater Bay Area Hamfes Committee for a most pleasant and interesting convention. Fo those who plan ahead, the Pacific Division Convention for 1975 wi be held in Fresno on May 2, 3 and 4. Hope to see you there Congratulations to the Mt. Diablo ARC on taking first place in thei class on FD. At long last the MDARC has their new repeater cal WR6AHK. The Pleasant Hill High RC has been reactivated under th call WB6WYS and should be on the air soon. Your Pacific Divisio Dir., W6ZRJ, has been busy in the Section, speaking before th North Bay AR Assn. and Mt. Diablo ARC. Interested in 220? Ther is a repeater, WR6ABH in operation with 222.02 in and 223.62 ou For info on equipment and crystals contact K6GSJ. From CCR the following were listed as new calls in the Section, WN6FPV WN6EPW, WN6EUI, WN6ETG, WN6ETF, WN6GMZ, WN6GOT WN6GPZ, WN6GPX, WN6GOX, WB6GMK, WN6GOM, WN6GXY WN6GQX, WN6GQS, WN6GSB, WN6HBM and WN6HCB. If yo are interested in contest of any type the Northern Calif. Conte Club just might be the place for you. For information drop a line t NCCC, P.O. Box 2025, Castro Valley, CA 94546. I might mentio that the NCCC did a fine job of operating WO6PCD at th convention. If you worked them and would like a QSL send a SASE to WA6AHF. Traffic: (Oct.) WA6IPI 97, W6JXK 88, K6UW 8, WB6DHH 3. (Sept.) W6JXK 75.

HAWAII – SCM, L. P. Corrigan, KH6GQW – SEC: KH6IKI New ECs for the section are: KH6IKG, Windward Oahu; KH6HRC Leeward Oahu. Congrats to KH6IJV on error of only 1.8 ppm FMT. KH6IAC is proud papa again, a girl on 11/1. Woody is on h way to Life Member. KH6BZF reports WØBGU in Hon. visitin daughter. W6NJU & XYL visited KH6 enroute to S. Pac and Gar attended Hon. DX Club meeting. KH6IGJ on the road so muc recently his absence has been noticed but not during the CQ W DX Test in which Joe scored almost 2 mega points. Joe also was o of the few to work ZM7 on 160 meters. KH6HRG and KH6IK busy in flying activities – maybe they're looking toward FHC? Joh has a TS520 now and plans HF mobile soon, also has been bitten b the SSTV bug. KH6IKB was 1st place-phone in The Aloha-Hawa QSO Party. KH6RS took cw honors. Awards were presented at th Hon. DX Club meeting, which KH6GDR hosted in his typical fin fashion. Ewa repeater changes to standard frequency pair this ye – 146.19 - .79. Hope you will assist our SEC in our emergenc preparedness. Contact Sam to see if you can help in the annual SE this month. I wish everyone a Haouli Makahiki Hou. Traffic: (Oct KH6IAC 154, KH6IKB 38, KH6IGJ 8. (Aug.) KH6IGJ 8.

NEVADA – SCM, Harold P. Leary, K7ZOK – WA7UEK active on Eye Emergency Net and others. W7BES assisted with th Boy Scouts on the Air Jamboree 10/19. The Las Vegas Rad Amateur Club now holds meetings every month on 1st Sun. Goo attendance has been observed. Get involved! Consideration duplexer for the Las Vegas Repeater is being considered. WA7IP and student Novices have Eldorado HS Club station active on th air. The writer has had the pleasure of working through Oscar 6 a will make week end schedules for those needing Nev. WA7WY KL7FGH are new in the Las Vegas area. K6MQX/7 was a memb of Field Day group with high score. W7OK has new 40-meter bea

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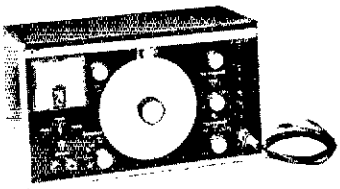

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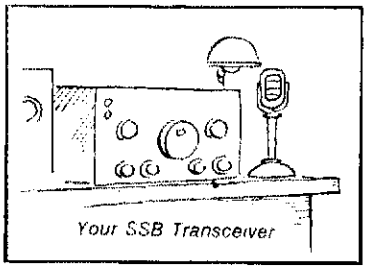
K7YUJ moved to desert OTH. WA7ZXJ has new General ticket. W7GAM building model airplanes. WA7OWW received his 100th DX card on 1 year Anniversary. Traffic: W7ILX 222, WA7UEK 50, K6MQX/7 9.

SACRAMENTO VALLEY – SCM, Norman A. Wilson, WA6JVD – SEC: W6SMU. On Oct. 28, ARRL pres., W2TUK met with 40 local hams in Sacramento. Thanks to W6NJU, WB6AUH, and the North Hills RC for promotional, publicity and financial considerations for that meeting. At the Pacific Division Convention, W6NKR, State RACES officer, conducted a session on Disaster Communications and WB6AUH was MC at the MARS/AREC/RACES banquet. W6SI reports a second fire at Sac. Red Cross putting the SARC out of a meeting place. Their Oct. meeting was held in the Cluny Clubhouse. K6KWN, ex-6EAU, is active in contests from Lake Almador with a 500 CX, homebrew CW rig, triband beam and a dipole up 80 feet in the trees. WA6AFE is back in Tulelake, Modoc Co., and is putting up antennas for 160 thru 2 meters to be driven by an FT101 and HW202. WA6PAY is trying a loop on 40 meters. WA6JVD was allowed to complete the CW SS before Murphy shorted and fused together the B plus, filter and AVC wires in his 75A4. Traffic: WB6MDP 3, WA6JVD 2.

SAN FRANCISCO – SCM, Tom Gallagher, W6NUT – The San Francisco Radio Club meets on the 3rd Fri. of each month at 8:00 PM in the emergency operating center of the Youth Guidance Center, 375 Woodside Ave. SF was well represented in the ARRL CW SS by W6BIP (with WA6DJI), WA6ICQ, WB6ITN, W6NUT, W6RNF, WA6VDV and WB6YCB. That WA7NIN operator was our own Nev. W6OAT who prefers to foresake the local QRM for the wilds of Nev. in contests. W1YL joined the local boys in a JA-style banquet prior to the Division Convention. Happy New Year to All. Traffic: W6IPL 281, W6RNL 124.

SAN JOAQUIN VALLEY – SCM, Ralph Saroyan, W6JPU – It is with deep regret that I report the passing of WA6EDQ to the Celestial Lodge above. Don was very active in ham radio, flying, and everything else that was interesting. He founded the Central Calif. Single Sideband Assn., and was a past pres. Don will be missed by many. W6PSQ has 214 countries confirmed. The Hillbilly Radio Goat Breeders Dehorning Society of Oakhurst held their first annual get together in Oakhurst. 70 were in attendance, and among those were W6NTK, W6QFR, K6BKZ, W6SXR, W6BWM and WB6OSH. WB6KWE held daily skeds with Honduras after Hurricane Fifi. WA6ZNC and WN6FUG are studying for their 1st Phone licenses. WA6JDB getting active in the traffic nets. WA6HJR a new call in Stockton. W6YKS is also on 2 meters FM. WB6GTI lost his antenna due to a lightning bolt. W6QKP, W6JPU, WA6JAX and WB6ETR with their XYLs attended the Pacific Division Convention in San Mateo. W6OWL working DX on 40 cw. A very Happy New Year to everyone reading this column and also to those who never read it. Traffic: WA6RXI 119, WA6JDB 19, K2SSX/6 3.

SANTA CLARA VALLEY – SCM, Jim Maxwell, W6CUF/K6AQ – SEC: WA6RXB. RMs: W6BVB, W6RFF, W6RSY and W6RFF made BPL, while WA6SCY, WB6VBG, WB6TYA and W6RFF all made PSHR. W6DEF reports the SPECS net provided communications for a March of Dimes Walkathon in Oct. W6PAA hunting for a hilltop, with a new DX/contest station in the offing. The West Coast Microwave Net (MICRONET) meets each Tue. at 2030 local on 1296.010 USB, reports WA6UAM. 18 stations are now on the roll call. RM W6RFF is QRV to talk on net procedures and the National Traffic System (NTS) to interested organizations. NCN secy. W6QNB also has net info available for an SASE. 220 FM activity is increasing by leaps and bounds, due in part to the efforts of WB6OOO, K6GSJ and others. OOO and the BAYCOM group have 4 220 repeaters on or in progress of coming on. The San Jose CD Net (RACES) has been reactivated, according to K6EJF. Weekly check-ins are welcomed on Wed. at 1930 local with K6UHZ as NCS. WA6UAM is QRV for Oscar 7 with ssb on both the 146 and 432 translators. The Foothills ARS will hold their annual Homebrew Contest in Apr. Certificates and prizes will be awarded to the champs. W6QNB QSYd to Wyo. for the Oct. CW CD Party, and even managed to work his own rare section. New officers for the Palo Alto ARA consist of K6YT, pres.; VE3FZK/W6, vice-pres.; W6DEF, secy.; W6QBY, treas.; WA6LNV, WA6YOQ, W6AIN dir. Pres. WA6UDE cordially invites all hands to drop by the Santa Cruz Co. ARC meetings, held the 1st Fri. of each month at 8 PM in room 716 of Cabrillo College. SEC WA6RXB has been appointed communications chmn. of the San Jose Red Cross Disaster Committee. Congrats to WN6GSZ and WN6GSW on receiving their tickets after completing the EMARC Novice Class. Novice classes also are in progress at the West Valley ARA and at Santa Clara Co. ARA.



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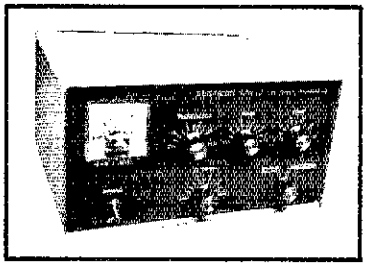
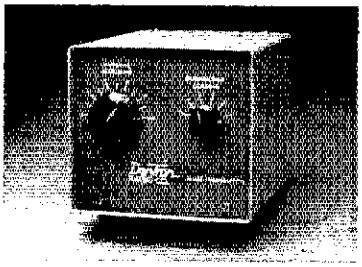


EQUALS

160 meters

AND---



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Telephone (216) 734-7388

Contact presidents WA6OHT and K6TXR, respectively, for more info. New SCV appointees for Oct. are K6WT ORS, W6HQN OO, and W6OWQ OBS. W6OWQ Bulletins are scheduled for RTTY MWF at 2000 local on 14080; 2100 local on 7040. NCN traffic for Oct.: QNI 797, QTC 495, 2011 minutes, 60 sessions, per RM W6BVB. Traffic: W6RSY 1099, W6YBV 365, W6RFF 268, WB6TYA 205, W6KZJ 110, W6BVB 105, WB6VBG 85, W6DEF 55, W6AUC 50, W6NW 41, WA6SCY 38, W6QNB 37, WA6HAD 13, WB6MXI 7, K6AQ 2.

ROANOKE DIVISION

NORTH CAROLINA – SCM, Chuck Brydges, W4WXZ – SEC: K4FBG. PAM: WB4JMG. VHF PAM: K4GHR. RM: WB4ETF. On Oct. 4-12 a special call, WL4GBC, was used for the Greenville Bi-Centennial and trustee WB4KZG is QSLing. New officers for Brightleaf ARC are W9NTV/4, pres.; WB4ZOM, vice-pres.; WB4KZG, secy.-treas. New Dir. for the Tarheel Net is WB4MKI, congrats. New officers for Cape Fear ARS are K4NUG, pres.; K4QFK, vice-pres.; WB9IBN, secy.; WN4IYY, treas. K4FTB finished new SB200 in time for CD Parties. W4EHF has new tower up antennae being added. WB4ZTI has new tower/TH6DXX worked 70 countries in DX Test. Reminder: Jan. is SET month so be ready to emulate disaster conditions and planning. WB4ETF working on 46/06 repeater for Charlotte. W4VGZ repeater in Burlington (07/67) has new 100-ft. tower and expecting new equipment with autopatch. WN4HDN has new harmonic op, congrats. W4OMW received his 50-Year award from QCWA. K4FBG, WB4EKJ, K4ZVK, WA4GKQ and K4GCN ran traffic from Crabtree Valley Shopping Mall in Raleigh and put our hobby in the public eye. The Carteret-Craven ARC has a Sun. 2-meter net going. New officers for the Forsyth ARC (Winston-Salem) are W4WXZ, pres.; WA4BTI, vice-pres.; W4IRE, secy.; K4HXJ, treas. I am very sad to record the passing of W4HUL, a long-time active amateur in NC, our sympathy to his family and many amateur radio friends. Traffic: (Oct.) W4OFO 144, K4MC 110, K4EZH 56, K4FTB 43, WB4KHZ 43, W4RWL 41, WB4OXT 38, W4WXZ 26, W4ACY 23, K4FBG 16, WB4TNB 13, K4VHO 12, WB4CES 9, K4TTN 6, W4EHF 5, K4CJZ 4, WA4IMH 1. (Sept.) K4MC 103, WA4FFW 6, W4RWL 6.

SOUTH CAROLINA – SCM, Richard H. Miller, WA4ECJ – Asst. SCM: Charles N. Wright, W4PED. PAM: K4GOG. RM: K4LND. Once more let me express appreciation for all the fine reports, letters, cards and comments that nearly every mail brings in from the troops in the field. We enjoyed an outstanding program on the early days of wireless at the Trident ARC of Charleston. Trident is a young, strong, and vigorous club with excellent leadership, a worthy heir of its predecessors in that area. Noted with delight is an article in the Evening Post on the activities of WB4OBZ as a Trappist Monk at Mepkin Abbey, near Moncks Corner. SSBN scored averages of 33.6 stations and 3.5 messages per session during the month. The call K4IQY will no longer be heard, Glenn having swapped it for K4ZU. Traffic: (Oct.) W4NTO 112, SSBN 109, WB4OBZ 64, W4WQM 38, K4NJS 12, K4FRX 10, WA4ECJ 5, WA4UZA 4, K4PJW 3, WB4LRK 2. (Sept.) K4NJS 41, K4ZB 20.

VIRGINIA – SCM, Robert J. Slagle, K4GR – Asst. SCM: A.E. Martin, Jr., W4THV. SEC: WA4PBG. Asst. SEC: WA4YIU. PAM: WB4BZX. Asst. PAM: WA9NEW/4. RMs: W4SHJ, K4IAF, WB2VYK/4, WA4AVN, WA4DHY. Note new RM, K4IAF – our many thanks to W4SQQ for his service as RM to the VN. I do not plan to run for reelection this fall, so start thinking! OO WB2LAI/4 turns in 10 single spaced pages of violations this month – mostly for edge of band violations! RTTY Net on 146.58 170 shift looking for QNI in Northern Va. area. OO WA4PRP back from vacation and busily logging Intruders, W4JUJ 2984 counties. LARC had good contingent at Gaithersburg. Hampton Roads Radio Assn. participated in recent elections. SPARK participated in Leukemia Walkathon. Welcome to newly licensed WN4KUT in Annandale. WA4AVN and K4KDJ BPL! New QTH of W4SUS taking toll! K4MLC enjoying extra traffic activity. Vienna Wireless Society participated in Halloween Spook Patrol. K4KA looking for Alaska on 40 for SBWAS. WB4FDT was busy politicking for Roanoke Div. Vice Director. Virginia Century Club and Va. Beach ARC operated WX4NFP at Va. Beach Neptune Festival. W4KX reports that he is still kicking. W4TZC got 2-meter antenna up. W4ZM promises activity. "Off Month" for W4TE. A tree trunk grew around feed line of W4YZC and shorted it. WA6CXK/4 busy aboard ship in Med running phone patches. KØPIV/4 letting traffic in between homework. Nets: VFN QNI 835, QTC 51; VSN 265/89; VN4ON 24/3; CVSN 461/66; VNTN 101/9. Also heard from RARC, SPAARC and

CW FILTER

The IMPROVED CWF-2BX offers RAZOR SHARP SELECTIVITY with its 80 Hz bandwidth and extremely steep sided skirts. Even the weakest signal stands out.

Plugs into **any** receiver or transceiver. Drives phones or connect between receiver audio stage for full speaker operation.

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●400 Hz or 1000 Hz center frequency available add $3.00.

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CWF-2, PC board, includes 4 position selectivity switch $15.95
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Unintelligible signals become readable as you slide the selectivity switch to optimize the audio bandwidth.

IC active filter includes high-pass filter plus selectable cutoff active lowpass filter. Select 2.5, 2.0, 1.5 KHz cutoff.

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WB4DRC. Out of space again — see Nov. '74 issue for net listings. Traffic: (Oct.) WA4AVN 518, WB4ZKG 424, W4UQ 240, K4KNP 230, K4IAF 175, K4GR 161, KØPIV/4 153, K4MLC 146, WB4FDT 142, K4KDJ 140, WA4GPT 114, W4QDY 107, WA9NEW/4 102, WB4KIT 101, WA4SMR 86, WB2VYK/4 63, WA4PBG 50, K4JM 43, W4SUS 30, WA4YIU 17, K4KA 16, W4YZC 8, K4EZL 6, W4MK 6, W4HIR 5, WB4WUZ 3, W4TZC 2. (Sept.) WB4WUZ 9, WB4RDV 8.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — SEC: WA8NDY. RMs: W8HZA, W8JWX. PAMs: W8DUW, W8IYD. Phone Net Mgr.: WB8DQX. CW Net Mgr.: W8HZA. W4KFC, 1st V. Pres., ARRL and Division Director Wicker, W4ACY spoke at the MARA dinner in Fairmont. V. Pres. Clark was presented a plaque of appreciation from the "Amateurs of West Virginia." Newly elected officers of the Monogalia Wireless Assn. are W8IOF, pres.; WA8TRE, vice-pres.; WA8YCD, secy.-treas. Mailing address, Box 912 Morgantown. W8GIO, now OPS and OO. MARA of Fairmont elected WB8LAI, pres.; K8LSN, vice-pres.; Terri Orsini, secy.; WA8EQI, treas. CW Net in 30 sessions with 157 stations, handled 77 messages. Phone Net in 31 sessions with 686 stations, passed 151 messages. WB8PHU at Terra Alta has WR8EY active, 147.000 in and 146.600 out. Parson amateur repeater, 13/73 awaiting license. WB8LAI and WB8DQX worked over 100 stations in MARA 2-meter contest. Three new Novices are WN8TJO, WN8TIN, WN8TDA. Code and theory classes starting St. Albans area. W8WUV on code and K8WMX on theory. MARA 2-meter net in 18 sessions, 112 stations and 24 messages. Wheeling EC Net with 9 sessions, 92 stations and 12 messages. Traffic: W8HZA 103, W8JWX 53, W8SQO 53, WB8DQX 41, WB8MKL 29, K8OEW 29, WB8NXA 10, W8JM 10, W8CUL 5, WB8NFZ 5, WA8NDY 5, W8DUV 4, WB8LAI 4, W8GWR 2, WA8LFW 2, W8LGT 2, K8LSN 2, K8NNK 2, WB8PAV 2, W8QDW 2, WB8SCD 2, WB8SQX 2, K8ZDV 2, W8AEC 1, K8BCF 1, WB8CTC 1, WB8DKF 1, W8GDP 1, W8GSN 1, K8IXO 1, W8KWI 1, WB8LAV 1, WB8MAV 1, WB8MZI 1, WB8RCP 1, K8ZDV 1.

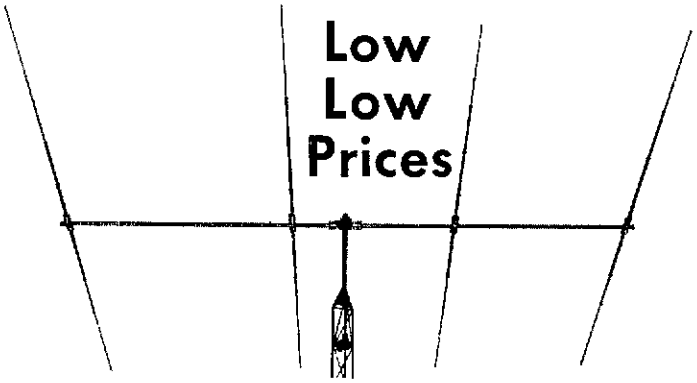
ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Clyde O. Penney, WAØHLQ — SEC: KØFLQ. RM: WBØHCK. PAMs: KØCNV, WAØYGQ. The Montrose Radio Club is reactivating with the following newly elected officers: KØIIT, pres.; WNØLCJ, vice-pres.; WØOMD, secy.-treas. Newly elected officers for the Denver Radio Club are KØPGM, pres.; WBØHWQ, vice-pres.; KØGJM, secy.; WBØHWP, treas. WAØKXD recently provided communications for a search and rescue mission for a lost deer hunter in the Colo. Rockies, and again when the search party itself became lost in darkness while looking for a second lost hunter in the area. KØPVI is enjoying his new Linear, new Hammarlund HXL-1, and new 204BA beam. He also presented a demonstration of Amateur Radio to 1500 Boy Scouts at Kiowa, CO on Oct. 5. Net traffic for Oct.: SSN QNI 133, QTC 61, informals 14, 27 sessions, 496 minutes. Hi Noon Net QNI 1028, QTC 26, informals 138, 29 sessions, 1056 minutes. Columbine Net QNI 1250, QTC 58, informals 280, 26 sessions, 1540 minutes. (Sept.) CCN QNI 53, QTC 25, 19 sessions. Columbine Net QNI 1149, QTC 75, 24 sessions, 272 informals, 1356 minutes. SSN QNI 120, QTC 72, 23 informals, 28 sessions, 450 minutes. Traffic: (Oct.) WØWYX 1412, KØZSQ 1266, WØIW 84, WAØYGQ 69, KØSPR 60, WØLAE 49, KØPVI 48, WØSIN 40, WØNFW 36, WØYCD 28, WAØTMA 26, WØHXB 24, WØGAQ 13, WAØYED 11, WØMYB 10, WAØHLQ 4, WØGW 2. (Sept.) WBØHSZ 153, WBØHCK 81, WØHXB 57, WØLQ 34, WØYCD 15. (Aug.) WBØHCK 85.

NEW MEXICO — SCM, Edward Hart, Jr., W5RE — SEC: W5ALR. PAMs: W5PNY, W5DMG. RMs: W5UH, K5KPS. New Mexico Road Runner Net meets 1800 daily on 3940 kHz. W5DMG, mgr. reports 657 QNI, 41 traffic handled. New Mexico Net meets daily at 1930 local time on 3585 kHz. K5KPS, mgr. reports 31 sessions with 195 QNI and 146 traffic. Since there is no Arizona CW net, plans are afoot to make this net an Arizona-New Mexico net until such time as enough interest is developed to make an Ariz. net practical. There is a new repeater operating from Tesuque peak, over 11,000 feet high near Santa Fe, on 22/82. This repeater covers the north and east very well, also goes south and west very well. WB5KSS hopes to be on shortly with RTTY. W5SHJ is back on 160 with the coming of the winter season. Other stations on 160 are K5MAT and W5RE. The Messilla Valley Amateur Radio Club acted as assistants to the police on halloween, acting as communicators with WB5FTR as net control. Traffic: (Oct.) K5MAT 471, W5UH 225, K5KPS 168, WB5KSS 145, W5RE 114, W5ENI 103, W5SHJ 26, W5QNQ 7, WA5MIY 5. (Sept.) W5YQ 11, WB5KNE 4.

Wilson Electronics

WILSON 204 MONOBANDER



The Wilson 204 is the best and most economical antenna of its type on the market. Four elements on a 26' boom with Gamma Match (No balun required) make for high performance on CW & phone across the entire 20 meter band.

The 204 Monobander is built rugged at the high stress points yet using taper swaged slotted tubing permits larger diameter tubing where it counts, for maximum strength with minimum wind loading. Wind load 99.8 lbs. at 80 MPH. Surface area 3.9 sq. ft., Weight 50 lbs., Boom 2" OD.

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- **M105** 5 ele. 10, 20', 2" OD **$ 69.00**
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- **M520** 5 ele. 20, 40', 3" OD **$189.00**
- **M715** 7 ele. 15, 40', 3" OD **$149.00**
- **DB45** 4 ele. 15, 5 ele. 10, 26', 2" OD **$119.00**
- **DB43** 4 ele. 15, 3 ele. 10, 20', 2" OD **$ 99.00**
- **DB54** 5 ele. 20, 4 ele. 15, 40', 3" OD **$209.00**

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UTAH – SCM, John H. Sampson, Jr., W7OCX – SEC: W7GPN. RMs: W7UTM, W7OCX. BUN meets daily at 1930 CUT on 7272 kHz, 783 check-ins, 10 messages. This was a slow month for traffic. W7BE has been awarded the BUN certificate. W7DKB participated in the disaster communications discussions at the Greater Bay Area hamfest. W7QDY is starting an instruction class for Novices in Tremonton. WA7BSG has filed 11 intruder watch reports. W7OCX had an interesting vacation in the Canal Zone. W7UTM getting set for an early winter by checking antenna systems and replacing guy wires. W7HOI experimenting with a two-element multiband switchable phase array. WN7WNA and WN7WHX passed the Advanced Class exam and WN7ZJD passed the Tech. WA7TSB passed the Extra Class code test but did not do so well with the theory. The Salt Lake Club started a new series of classes for radio beginners. It is sad to report W7NIA a Silent Key. Activity continues high on two meters with all repeaters on operation. This is my last report to you as your SCM. I have appreciated your cooperation and support. Traffic: WA7TSB 84, WA7MEL 45, W7OCX 26, W7DKB 23, WA7HCQ 6, W7UTM 4, W7LLH 2, W7QDY 2.

WYOMING – SCM, Joe Ernst, W7VB – W7NK spent three weeks at the game check station, Shell, Wyo. and kept us posted on hunting conditions in the Big Horns. Former WA7EUX moved from VA back to Wyo. and now on the air with the help of K7AHO and W7VB. New call from Cokeville is WA7ZZY. K7NQX reports the Cheyenne repeater WR7ACZ has autopatch facilities. Also W7COK going full speed on the Wyo. Hamfest scheduled for Cheyenne third week end in July 1975. Make plans to attend the Wyo. Frontier Days at the same time. W6QNB/7 worked fixed portals from Pinedale, Wyo. the week end of Oct. 19 using the backseat of a car as hamshack, and working the County Hunters Net and CW CD Party. W7HNI looking for an 8 MCS VFO to chase Oscar 6, 7 & 8. W7SDA is looking for a net mgr. to take over the Wyo. Cowboy Net Jan. 1, 1975. The net meets 6:45 PMMDT on 3950 M-F. Traffic: K7NQX 477, K7WRS 80, K7VWA 28, W7HNI 21, K7ITH 21, WA7TCQ 6, W7IOI 5, WA7WFC 3, W7SDA 3, W7BKI 2, W7MZW 2.

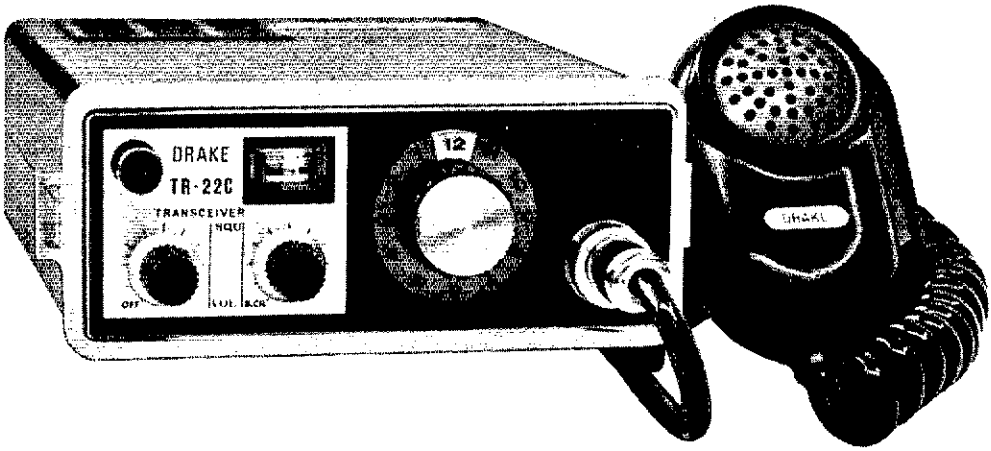
SOUTHEASTERN DIVISION

ALABAMA – SCM, James Brashear, WB4EKJ – SEC: W4DGH. RM: W4HFU. PAM: W4RQS. WB4FJP has an SB301. K4JK says new tuner works FB. K4CUU new TR-4C with SB220, he participated in the Colbert/Lauderdale AREC Halloween safety patrol. Congrats to WN4HTG on earning Net Certificate on AENP. K4UMD reports time change rough on AENM. He has a new TR4-C. Congrats to WA4JBC, formerly WN4JBC. He is using a DX-40 and HQ-180, has worked 11 countries and 31 states. School limiting activities of WB4KDI, WB4SVH. The Huntsville ARC provided communications for an for Project Concern. Huntsville ARC also provided communications for an Arabian horse endurance ride (50 miles), on the same day demonstrated amateur radio and operated a traffic-handling station in local Dept. Store. WB4EOW reports tropo condx real good on evening of Sept. 15. K4BPY worked Ark. and Okla. on 2 meters and K4VOW worked Kansas City, Mo on 432 MHz. WB4EOW received help from Huntsville ARC TVI Committee in correcting his TVI problem. WB4TJO/4 operating on 6 meters from Lanette, Ala. with an SB110 and four-element. Be sure and support your EC, Net Mgrs. and club groups in the SET later this month. Congrats to WN4EVY for highest Section score in the 1974 Novice Roundup. Appointed WA4BDW EC. Endorsed K4AOZ OBS. W4HW (formerly 3AAW) and XYL recently visited the Huntsville ARC and W4HW gave a talk on his early amateur radio days. K4EHT gave an interesting talk to the HARC on methods to keep from having your mobile rigs, tape decks, etc. stolen. W4LNN trying to start a North Ala. Chapter of QCWA. Contact him for details if interested. Traffic: (Oct.) WB4FZQ 113, W4LNN 84, K4AOZ 80, W4RQS 69, WB4EKJ 68, WB4KSL 67, WN4IYW 34, WA4AJA 27, WN4HTG 27, WB4SVH 22, WB4RCF 12, WB4KDI 11, K4VF 11, K4CUU 10, K4UMD 10, WA4ZDW 9, WB4NLU 7, WB4IXA 5, WB4ZQF 5, WB4TVY 2. (Sept.) WN4HTG 21, WB4ZQF 10.

GEORGIA – Acting SCM, John Englund, K4JJQ – SEC: K4WC. PAM: K4JNL. RM: K4JJQ.

Nets	*Freq.*	*Time(Z)*	*QNI*	*QTC*	*Mgr.*
GSN	3.595	0000 0300	404	164	K4JJQ
GSBN	3.975	0100	1372	110	K4JNL
GTN	3.718	2300	N.R.	N.R.	WB4TVU
GVEN 2	146.94	0230	416	37	K4YRL

New appointments: OPSs: WA4AKU, W4NET; ORSs: WA4FSL,



DRAKE TR-22C

2 Meter FM Transceiver

Features

- 12 Channels
- Monolithic crystal filter in IF for superior adjacent-channel selectivity
- Improved microphone

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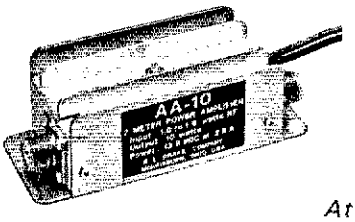
Including Mike, Over-the-Shoulder Carrying Case, 120 VAC and 12 VDC Cords, 10 ni-cad Batteries, and Speaker/Headphone Plug



SPECIFICATIONS

GENERAL: • **Frequency Coverage:** 144 through 148 MHz. 12 Channels, 2 supplied: (1) Receive: 146.52 MHz, Transmit: 146.52 MHz; (2) Receive: 146.94 MHz, Transmit: 146.34 MHz • **Power Requirements:** 13.0 Volts DC±15% • **Current Drain:** Transmit: 450 mA, Receive: 45mA • **Antenna Impedance:** 50 Ohms • **Dimensions:** 5⅜" x 2 5/16" x 7½"(13.6 x 5.8 x 19.1 cm) • **Weight:** 3.75 lbs (1.7 kg)

RECEIVER: • **Sensitivity:** Typically .5 microvolt for 20 dB quieting • **IF Selectivity:** 20 kHz at 6 dB down; ±30 kHz channel rejection greater than 75 dB down. • **First IF:** 10.7 MHz with 2-pole monolithic crystal filter. • **Second IF:** 455 kHz with ceramic filter. • **Intermodulation Response:** At least 60 dB down. • **Modulation Acceptance:** ±7kHz. • **Audio Output:** At least 1 Watt at less than 10% distortion. • **Audio Output Impedance:** 8 Ohms

TRANSMITTER: • **RF Output Power:** 1 Watt minimum • **Frequency Deviation:** Adjustable to ±10 kHz maximum, factory set to 6.0 kHz. • **Multiplication:** 12 Times

ACCESSORIES

- **Model AA-10 Power Amplifier:** Use with TR-22C or any transceiver up to 1.8 watts output. 10 dB power increase. At least 10 watts output at 13.8 VDC. Automatic transmit/receive switching **$49.95**
- **Accessory Crystals** . . . . . each **$7.50**
- **Model MMK-22 Mobile Mount** **$9.95**

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WB4ZHJ. I sadly report the passing of W4LUA, one week after he was awarded the Ga. Amateur of the Year by the Ga. SSB Assn. meeting in Macon. K4KEC named at same meeting in testimonial signed by Gov. Carter, Sen. Goldwater, Congressmen Brinkley & Stuckey and Eddy, K4JNL, W4RTX now Extra Class. New officers of Ga. SSB Assn. K4JNL, K4ZYK, WA4AKU, WA4VWV and WB4WQL. K4WC doing fantastic job building AREC roles at 'fests in Rome and Lanier, meetings in Athens, Macon and Atlanta. W4JM attended QCWA meet in Orlando and won a Simpson 260! OO reports this month from K4CBO and WB4SST. Keep up the FB work fellas. W2FUK, ARRL Pres. was hosted in Atlanta by W4BTW, W4BCD, W4BTX, WA4VWV and K4JJQ. Traffic with * indicating PSHR: (Oct.) WA4SL 223, K4JJQ* 172, W4AAY* 118, K4FJY 50, WB4CTL 47, WB4WQL 34, WA4LLI 32, WA4GVJ 28, WA4NMU 18, W4CZN 13, W4JM 8, K4WC 8, W4DOC/4 2, K4BAI 1. (Sept.) W4JM 7, K4JSV 5.

NORTHERN FLORIDA – SCM, Frank M. Butler, Jr., W4RKH – SEC: W4IKB. RM: WB4DXN/WA4WIW. PAMs: WA4IZM/75; W4SDR/40; WB4BSZ/VHF. WB4NHH and WB4BSZ had 100% QNI on NFPN this month; K4ELH, WA4FBI, WB4PAV and WB4UPJ earned Net Certificates. D4RN meets at 2200 GMT on 7235 kHz and needs Fla. reps. WB4GHU is GN Gator of the Month. W4BYG, ex-Ga. SCM, moved to Jacksonville, Pensacola has two new repeaters – WR4AIK and WR4AIW. WB4SKI made BPL. WA4CAD had high Section score in VHF-QSO Party. Tallahassee, Panama City, Fort Walton & Pensacola were represented at a meeting of NW Fla. repeater groups. WA4FAX and W1JQQ/4 have strong 2m signals from Panama City. New officers Tallahassee ARC are WA4BJG, pres.; WB4EWQ and WB4VDL, W4HMO, W4FRQ, W4RUF and WB4UPJ working at the State CD Center. WA4KXL on 75m SSB & RTTY from Tallahassee; WB4LBT on 2m FM from Bristol. WA4SIB upgraded from Conditional to Advanced. K4BDY held open house during Apalachicola Seafood Festival. Gainesville hams provide communications for CD during U. of Fla. home games. WA4PWF conducting Novice code & theory class. WB4GRK formerly DA4AP. W7VTJ/4 now K4KUU, but W7EM/4 hasn't changed! W4BYG appointed ORS/OPS. K4KUI moved to Fernandina Beach and active on NFPN. W2GTO/4 a Silent Key. New DBARA officers WA4JCP, WB4ESH, K4EZE, WB4OWX, WB4GHU & WA4CRI. W4KLT joined Daytona Beach club. Volusia RACES provided communications for Halifax River Regatta. WN4JNC reports 10m Novice band open. Traffic: (Oct.) WB4SKI 511, WA4FBI 365, WB4DXN 323, WB4GHU 293, K4VND 262, W4LLM 182, WB4UPJ 176, W7EM/4 139, W4WNY 98, W4SDR 94, WB4DAD 62, WB4FJY 56, W4KIX 56, WB4JHQ 46, W4RKH 42, WA4IZM 40, WN4JNC 39, WB4NJI 35, WB4BSZ 16, W4AFT 15, W4LSR 14, WA4EYU 13, WB4VDM 13, WB4VMP 11, K4IZT 10, W4YYO 10, WB4NHH 9, WA4CRI 6, K4RNS 6, WB4VAP 5, WB4VYU 2. (Sept.) WB4VDM 15.

SOUTHERN FLORIDA – SCM, Woodrow Huddleston, K4SCL – SEC: W4IYT. Asst. SEC: W4SMK. RMs: K4EBE, W4EH, WA4GBC. PAMs: WA4NBE, W4OGX. New appointments: WA3VXY/4 OVS; WA4ZLW OBS and OVS. Endorsements: W4DVO, K4SCL ORSs. Cancelled WA4ATF OBS. K4DRH says he is looking for a new receiver from Santa Claus. K4OG having made excellent score on last FTM hopes to upgrade his OO appointment next one. Two other OOs scored very well on Sept. 8 FMT and upgraded to Class 1 in Nov. These are: W4AWS and K4NE. K4JPI received a nice write-up in "Today" paper for his "Society of Wireless Pioneers" activity. As OO, he likes to talk to offending stations rather than send OO reports, pointing out that (1) it saves postage, (2) gets there faster, (3) he may be able to help correct the problem, and (4) amateur radio is supposed to be for 2-way communications. Seems to make good sense. How about it? But we still like to receive our OO reports on Form 13. How else can we keep score? WN4GNI active on QFTN with DX-60B and home-brew break-in system. Only one OVS Form 18 received. It was from W4DO who reported working about 30 stations through Oscar 6. OVSs: Please send your Form 18s. Traffic: (Oct.) K4SCL 408, WA4IJH 339, W4WYR 245, WA4SCK 237, WA4GBC 225, K4AIZ 209, W4EH 174, W4DVO 86, WA4NBE 73, W4DQS 62, W4NVU/4 60, K4SJH 59, WB4AID 58, W4BM 56, WA4UQQ 49, WA4EIC 46, K4BLM 45, WB4HJW 34, K4NE 34, W4BCZ 30, K4QG 30, W4IKA 27, WA4HDH 22, W4SMK 22, WB4AOC 21, WA4ATF 21, WA4BPE/4 19, W4TJM 19, K4CFV 18, W4MML 17, W4NTE 14, WB4TRI 13, K4EBE 10, K4DRH 9, WB4VYU/4 7, K4SGR 1. (Sept.) WA4GBC 237, W4MML 11, WN4GNI 6, W4DO 4.

WEST INDIES – SCM, Juan S. Sepulveda, KP4QM – Saludos Amigos. KP4DDP participated on the 1974 Jamboree-on-the-air

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with about 100 boy scouts visiting the site. KP4AOC, KP4DLX, KP4AHQ helped. KP4QM projected two films for training and entertainment. H18MN passed away last Oct. Nanita was well known by KP4s. Congratulations to KP4s DJE, DHD and CQC on was well known by KP4s. Congratulations to KP4s DJE, DHD and CQC on becoming Extra Class licensees. KP4QC back on radio. The CW net on 7120 kHz operating on Sun. at 11:00 AM. KP4DS and WP4DSZ acting as NCS. KP4DQN & KP4DRJ will put a repeater on the air to cover the Vega Baja area. KP4DRT travelled stateside. The RCPR has decided to celebrate the annual hamfest on Mar. 23, 1974 and the Amateur Radio Week from Mar. 16 to 22, 1975. The medicare repeater moved to 4/64. Hasta Luego. Traffic: KP4WT 42.

SOUTHWESTERN DIVISION

ARIZONA – SCM, Marshall Lincoln, W7DQS – W7YS reports new Novices in the Sierra Vista area are WN7ZMQ, WN7ZNL, WN7ZNY, WN2WBN and WN3WVX. Novice classes are conducted at the high school. K7CVT, new OVS appointee at Tucson, reports construction started on 1296 MHz transceivers for himself and for W7LFX and K7NEQ, and reports he is designing a memory type keyer to store the four exchanges needed for meteor scatter work and play them on command. WB2WPY 7 reports communications were provided for the Tucson Jaycee annual Halloween mardis gras by the Tucson Repeater Assn. members W7CEN, W7GMR, W7HSG, W7JIC, WA7EZN, K7MMN, W7OAO, K7PQI, WA7RKI, W7ZFC, K7UHW and himself. W7HXM and W7JDL, Prescott, and W7RU, Williams, are new AREC members. W7DNQ now K7CC. All Ariz. ops are urged to participate, or at least monitor traffic nets serving their areas during the SET. W7UQO reports Oct. Cactus Net traffic totaled 332 with 818 check-ins. WA7JCK reports ATEN Oct. traffic totaled 24 with 422 check-ins. Net certificates were issued to W7RQ, WA7KQE and K7NMQ. Traffic: K7NHL 250, W7DQS 41, W7PG 39, WB2WPY/7 37, WA7JCK 12, K7NTG 7, WA7KQE 6, K7NTG 6, K7GLI 1, K7NMQ 1.

LOS ANGELES – SCM, Eugene H. Violino, W6INH – SEC: WA6DUC. RMs: WB6OYN, K6UYK. The QCWA had a good turnout at their recent banquet at the Long Beach Petroleum Club. 146 members attended this fine affair. The Banquet was a success due to the hard work of pres. W6YYV and W6PHE. The new pres. is W6LPJ; W6FQ, vice-pres.; W6PHE, secy. WA6ARC is keeping regular schedule with Stockton on 22 MHz with 40 watts. WB6IMV rewiring shack for 220v, in preparation to increasing VHF power to 2 kw pep. W6FNE active on 40-80 meters with a new Collins S-line. The St. Clarita RC had Mr. Agajanian of the "INDY 500" as speaker at their recent club meeting. This group also furnished communications with seven mobile units to cover the local "Frontier Days" celebration. W6EJJ presented a program on "Oscar" Amateur Radio In Space, at the Tel Co. RC. The Ramona RC displayed pictures of new pres. K6RXJ's shack and workshop. "Off Road Racing Communications" was the subject of W6NHX at recent TRW RC meeting, the club is also sponsoring a big membership drive. San Fernando RC's WB6IPY has been appointed the new chmn. of the public service net. This is a very important position with this RC as they are very active in their own public service net. WA6KUS has been giving outstanding programs to the various clubs this year, and now has a new one – "A review of the latest Amateur Radio Publications and evaluated the publications available from several sources." WB6YIZ gave a tech talk on Antennas. The JPL RC, recently received the donation of a Collins 75A1 receiver, Central Electronics Sideband Slicer, etc. from WB6JJT. The Club plans to use this in their Novice position. WA6OPB reports that his family is 100% ham, they include XYL, daughter, son and the OM. WA6IDN reports good turnout for (Witch Watch) with the help of four police units this Halloween many locals participated. The United RC of San Pedro again had a booth at the San Diego Convention and gave out hundreds of electronic keyer printed circuit boards. John Griggs our popular director has been declared elected for another 2-year term starting Jan. 1, 1975. K6ASK modifying Gonset III 2-meter transmitter for two meter fm. WA6TCH recently received CP-30 wpm. Rich now working at Henry's radio emporium. K6UYK visiting Israel for three weeks, hope everything stays peaceful during his stay. W6UE/WB6DJP new operator at Cal Tech radio station very active on SCN. Mojo comes to SCN with a wealth of experience, formerly Net Mgr. for TN, active in RN5, CAN and TCC. Traffic: W6INH 203, W6UE/WB6DJP 173, WB6MKV 169, W6OEO 151, K6UYK 137, WB6VZI 118, W6QAE 96, WA6IDN 91, WA6TLV 77, W6IVC 63, WA6BCO 26, W6HUJ 21, WA6TCH 16, WA6ZKI 12, W6USY 10, WA6WJV 9, WA6EWY 6, W6NKE 5, K6CIL 4.

ORANGE – SCM, William L. Weise, W6CPB – Asst. SCM: Dick Birbeck, K6CID. SEC: WA6TVA. PAM: K6YCI. RM: WB6AKR.

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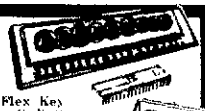

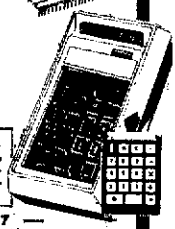

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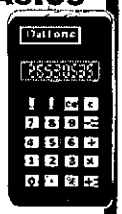

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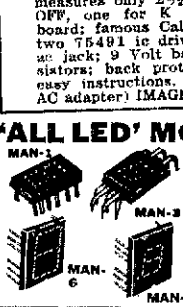

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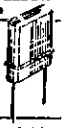

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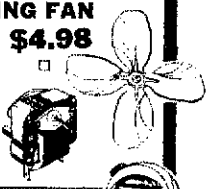

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POLY PAKS

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Calder School ARC with 8th graders licensed five Novices last year and have 12 students now in Novice class. McDonnel Douglas Astronatics RC graduated four new Novices, WN6GAT, WN6GLV, WN6GIC and WN6GZS. These employees were trained during lunch time sessions. Who said you can't learn code? Just takes a little personal effort. WB6OYN SCN Mgr. doing an excellent job with traffic and the ZERO Beat. Congrats Kevin. Election for Vice-Director took place in Nov. Hope every eligible member voted. If not, don't complain. K6GM1 is still having problems with his rig. Info has been received about a new radio club at Univ. Calif. Irvine. Look for them on the air. Thanks for tip from WA6DBX. W6QBD says he is still plagued with 46KV power line QRN. The ARRL SW Division convention was a "Blast". Glad to meet so many of you for an eyeball QSO. Congrats to the San Diego Committee. K6YNB says the highlight of the month was seeing the result of the JUNE '74 VHF contest in QST. Set a national record score. Have won nationally two years in a row. An excellent job Wayne. Congratulations from all the gang in Orange Section. W6BUK returned from 8700 mile trip to east coast visiting old friends and relatives. My best seasons greetings to all in the Orange Section. Hope the man with the White Beard brings you what you have always hoped for. Hi. Traffic: (Oct.) K6GMI 311, WB6AKR 59, WA6YWS 51, WA6EGO 41, W6WRJ 32, W6CPB 24, WA6TVA 24, W6QBD 1. (Sept.) WA6YWS 48.

SAN DIEGO – SCM/SEC, Cy F. Huvar, Jr., W6GBF – Asst. SCM: Art Smith, W6TNI. The SDGO Emergency mobilization plan is to be carried out whenever a serious emergency exists. Members and volunteers are to proceed to established assembly points with equipment and supplies, to organize into teams for deployment as needed by governmental or disaster- relief agencies. ECs will provide for rapid activation on 3905 kHz, 29.375 MHz, 50.25 MHz, 145.5 MHz (am), and 146.52 MHz (fm). The amateur radio control center will be established and each assembly point will maintain communications. Each person should have 72 hours supply of food , water, fuel and operating supplies. Be prepared for inclement weather. Plan to attend the Section breakfast on the 11th at Lyman's (WB6PLZ) 4650 Mansfield. Details for the SET on 25/26 this month. Renew AREC station mobile cards. SDGO Mtn. Rescue Team busy showing their new Comm Van to Palomar ARC. North Shores ARC had Mr. Spellman, local FCC engineer. SDGO State Univ. had meeting with plans for ATV and IC-230 operating. El Cajon ARC had annual auction with WB6LBM doing the honors. Convair ARC had nice meeting with K6VV describing his super vertical. SOBARS were a PC board by W6SRS, WA6EYX and WA6DMB on mend after surgery. WA6SHT still not well. WB6ZEQ departed for far east, good DX Smitty. New calls south of border are XE2EBE and Wife XE2MRE who operate the deaf school at Guadalupe. PSHR: WB6PVH. Traffic: (Oct.) WB6PVH 425, W6BGF 164, W6PZU 54, W6DEY 46, WA6IIK 10, W6GBF 6, K6PM 2. (Sept.) WA6DMB 160

SANTA BARBARA – SCM, D. Paul Gagnon, WA6DEI – SEC: WB6HJW. RM: K6QPH. PAM: K6EVQ. Our clubs continue to be quite active this month. W1ICP from ARRL was guest speaker at Estero Club gathering in Morro Bay and Prose Walker from FCC was speaker at SBARC meeting. W6RNZ holding code classes in SB on Mon. 1975 officers of VCARC are WB6COQ, pres.; K6VMN, vice-pres.; WB6NNP, secy.; WA6WYD, treas. CVARC emergency group in TO provided comms for Heart Assn. Cyclethon with WB6WGE, WB6NYK, WN6HGF, W6ORE, WB6EAN, WB6NYH, WB6PFY and W6GEB participating. VCARC, MAKRAC, SMRA, and Poinsettia clubs combined to present amateur radio at the Ventura County Fair and operate special station WF6VEN. OSL to W6MHK. WA6YNO and WF6VEN made BPL. W6MUL utilized WR6AEP in Civil Defense drill for Hueneme HS. SB AREC provided "huntee" (WA6YPK) for 146.52 transmitter hunt. WB6DCK in Oxnard utilized WR6AEP to call W6EXM to obtain CHP assistance for accident on 101. When K6YLQ rolled his jeep while returning from repeater repairs, WR6AEP was instrumental in securing assistance and medical help. WB6RWY, WA6MNA, WB6EDG, WB6LND assisted. K6YX new NCS on MTN (3928 at 1900). Fiesta City Net is now on 3725 at 1930 on Thur. ZL2BT was guest of W6KLR in SB. W6OAL is assistant Project Mgr. for Oscar 7 at Vandenberg. K6QPH and WA6DEI lost Quads in windstorm prior to SS contest. WA6VVK new NCS on Morro Bay AREC net (146.40). Satellite ARC has won the TRICAR FD Award for 1974. PSHR: WA6DEI 47. Traffic: WA6YNO 587, WA6DEI 369, WF6VEN 238, W6IDU 48, WA6WYD 43, WA6OBT 18, K6QPH 12.

WEST GULF DIVISION

NORTHERN TEXAS – SCM, L.E. Harrison, W5LR – Asst. SCM: Frank E. Sewell, W5IZU. SEC: K5KQM. RM: W5QU.

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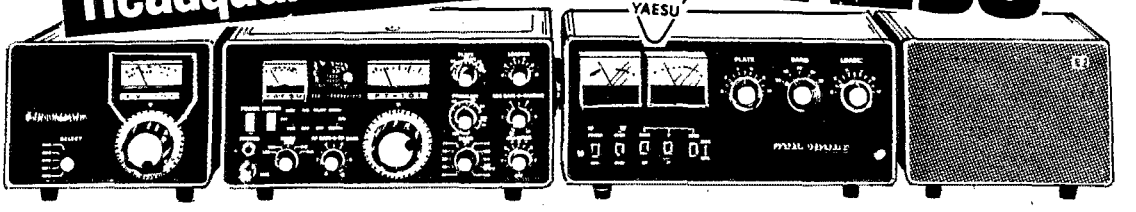

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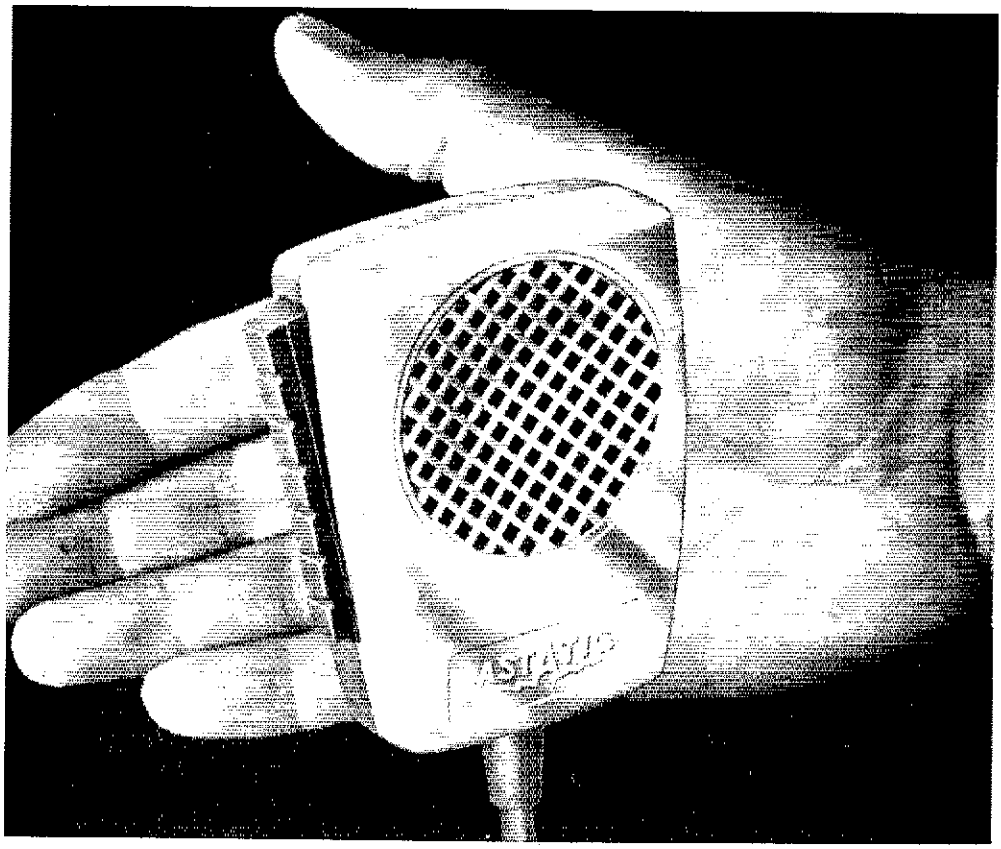
WB5IKX, Midland ARC working on idea covering OO presentation before club. Pro. Dir. wants taped discussion of OO program further implemented by phone patch and/or telephone call to SCM for Q and A session. This is new and may or may not work. W5NFO represented SCM at Lubbock swapfest, 300 attended. W5EYB attended MARS meeting, Texoma now history. Some 700 amateurs plus XYLs present. W5QU won freq. counter. W5JA chmn. Texoma Eyebank Party reported excellent attendace, Oct. report shows 655 check-ins, 816 minutes, 298 eyes requested, 66 eyes transferred, yearly total 567. Grand total 7413. WN5LAT desires info re Okla. area net. Plano ARC Oct. issue PARKING TICKET says club meets 2nd Wed. each month. First Nat'l. Bank Bldg. ARRL dues jump to $9.00 Jan. 1 '75. Sept. report W5JA check-ins 605, 772 minutes, eyes shipped 65. WB5BFW sends activity report. Tex cw traffic net meets 1900/2200 3770 kHz daily. OO Class IV issued for WA5EBQ. PAM W5GSN issued OPS plus Form 4 cards WB5AAR. Also reappointed OPS WA5RUF and K5BDC. Silent Keys include WA5GND and W5AQS. W5LR reports W5QBM Silent Key, a former pres. Richardson WK and strong mainstay for this group. His departure will be sorely felt for years to come. Section Net Certificate now in office for WB5GRZ. Phil Lightfoot, Waxahachie, Tx reports problem with W5 QSL Bureau since last Mar. Correspondence with proper people have cleared Phils problem. OVS WB5CHW forwards FB report. Shows some 15 states during period of frontal passage Oct. 14 to 28. States include Colo., Utah, Ariz., Calif., Mont., Ore. Candidate needed for Emergency Comm Adv Committee. W5QU sends report on W5HY new cw man. FB OM. WB5DXB appointed ORS. SEC K5OKM reports 100% 345 full members. W5IT has RTTY gear available to interested party, see him at 946-1356. Traffic: (Oct.) W5TI 326, WB5BFW 204, W5QU 170, WA5OGE 146, WB5BFW 110, WA5NSJ 68, W5SHN 62, W5OWV 58, W5GSN 32, K5QKM 20, WA5EZT 19, W5URD 9, WA5BXH 8, W5LR 5, WB5BFZ 1. (Sept.) W5QU 171, W5GSN 118.

OKLAHOMA – SCM, Cecil C. Cash, W5PML – Asst. SCM/SEC: Leonard R. Hollar, WA5ESN. RMs: OLZ WB5GWB, SSZ WB5EEY and OAN WN5KNK. PAMs: STN WB5AZS, OTWN WA5OUV and OFON WA5ZOO. WN5KNK sporting a new antenna farm said he had an antenna raising party a few weeks ago and got all his antennas up better and working real fine. Hal is surely doing a good job holding the OAN (Novice Net) together, needs more help from all Novices plus many more General or higher. WN5KCG/5 is one of the mainstays with Hal. You think this net on 3705 kHz is just for Novices? No, No, W5RB (Extra Class) works as hard on that net as any one else. New EC's are W5MCJ in Cleveland CO. W5JWN in Garvin and PONTOTOC Cos, and WB5AXH in Kiowa Co. We welcome to Oklahoma City and the West Gulf Division WN5LJQ from the Delta Division in La. Hope to see Mike on OAN, 3705 kHz at 6:30 PM local time daily. K5TLG moved to Miami from Tulsa. W5IJ says its really bad when you can't move a message from Oklahoma City to Tulsa on two days phone nets. Congratulations to new Advanced WB5LOZ, new Generals WB5KCG/5, WB5KNB and WB5LOD. Also to new Novice WN5MZZ. Ada's new club call is WB5NBA. Traffic: W5RB 188, WN5KNK 166, WB5KCG 62, WB5GWB 54, W5SUG 34, WB5AZS 30, WA5ZOO 23, WB5ELG 16, W5FKL 15, W5PML 14, WA5OUV 13, WA5FSN 7, WB5KHU 5, WB5EEY 4.

SOUTHERN TEXAS – SCM, Arthur Ross, W5KR – SEC: WB5CUR. PAM: W5HWY. RM: W5UGE. OOs reporting this month: WA5ZBN, W5RBB, WA5LTQ; OVSs WB5GYF, WB5CIT, K5LZJ, K5CWS. ORS WB5IOG checks into TEX CW Net from W6UE, Caltech. OVS K5CWS has 10 new countries; reports El Paso repeater WR5ACJ now up on a mountain (.28/.88); El Paso 22/82 repeater new call WR5AFV. WB5JFH and WB5JFI passed General. WN5MYR is new Novice in Cleveland, TX. OVS WB5CIT reports his 450 MHz repeater doing as well as 2 meters. Brazoria County ARC conducted JOTA in FD fashion. 7290 Net has new officers: EC W5TOP, mgr.; WA5YEA, asst. mgr.; W5KLV, secy.; W5JFZ, treas. and flower fund chmn. RM W5UGE, ORS/OO WA5ZBN and EC/ORS W5UJJ enjoyed Central Area staff meeting in New Orleans. W5UJJ now has RTTY in big way, also has regular TCC sked. WA5VBM and WA5YEA spent many hours on IMRA following Honduras disaster. WB5CIJ became Silent Key. WA5RKU moved to Houston. ORS II WN5LAS looking for FT-101. WN5MNQ and WN5MNR new father and son team in Corpus Christi. Corpus Christi ARC had big garage sale. WA5ZAY is new EC for City of El Paso VHF group; he is a police sgt. and will work closely with EC K5UYH in El Paso County. Traffic: (Oct.) W5UGE 435, W5TOP 368, WB5CUR 317, WA5VBM 203, W5UJJ 163, WA5YEA 129, WB5AMN 123, WA5ZBN 111, W5KLV 89, K5HZR 62, K5BSZ 47, WW5HWY 43, W5RBB 40, WB5IJR 39, W5TFW 38, W5TST 21, W5BGE 20, K5ROZ 20, WB5IBT 17, WA5FOE 15, WB5GNP 8, WB5HJV 4, K5RVF 1. (Sept.) WA5YEA 80.



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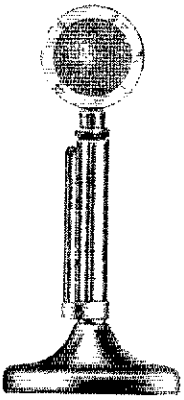

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CANADIAN DIVISION

BRITISH COLUMBIA – SCM, H.E. Savage, VE7FB – Thanks to the DX Club, VE7WJ, VE7ALR, VE7WG, VE7ATP who put one of our handicap amateurs back on the air VE7CE by installing tower and TH6DXX beam. VE8CV is coming South and VE8NN is taking over the North reporting. VE8DX new call working 80. VE8AAA Fort Smith ARC new station. VE8NS, Homebrew 15-meter beam four-elements looking for the DX that's coming. VE8AK was VE6AWI. VE7BBL signing VA7BBL portable during summer 9000 feet up in Colo. operating as HW-7. Two watts and sagging dipole doesn't exactly create pile-ups but it was fun. VE7TT reports another good month as OO with no faults to be found. VE7OQ is operating smoothly with his pace-maker, and states he has never felt better to take on the DX contest. Report from VE7SE been too busy on mosquito control to operate twenty this summer, (well he did kill one bug!). Traffic: VE7ZK 20, VE7QQ 7, VE7TT 3, VE7AZG 2.

MANITOBA – SCM, Steve Fink, VE4FQ – With regret we record the passing of VE4HW. Bill was one of our most active amateurs and was a long-time SCM. VE4VV received his Advanced ticket, while we welcome our youngest ham, VE4SY in Winnipeg, age 12. MEPN has reactivated the Swap and Shop net after the regular Sun. session. Congratulations to VE4AR on a new junior op. VE4TY now teaching in Winnipeg. VE4HE and VE4IA are both sporting new TS-520 rigs. Our Manitoba repeaters are VE4BDN (34/94) in Brandon and VE4XK (46/94) in Winnipeg. Let's hear from you folks in northern and rural VE4-Land! MTN (3660 kHz at 0030Z daily): 31 sessions, 187 QNI, 73 QTC. EMPN (3765 kHz at 0100Z daily): 31 sessions, 1069 QNI, 20 QTC. Traffic: VE4OW 53, VE4PG 48, VE4XP 8, VE4EF 6, VE4JP 6, VE4LN 6, VE4TR 6, VE4LU 5, VE4RO 5, VE4DS 4, VE4AI 3, VE4BM 2, VE4FK 2, VE4XN 2, VE4HA 1, VE4JA 1, VE4LA 1, VE4PA 1, VE4TT 1, VE4VV 1, VE4YQ 1.

MARITIME – SCM, W.D. Jones, VE1AMR – SEC: VE1SH, RM: VE1ARB. The 21st annual VE1 contest will be held Jan. 21, cw, and Jan. 26, phone. Times 7 AM to 7 PM local. On Oct. 31, the VE1RPT group in the Moncton area, assisted the RCMP in the second annual witch hunt, 17 mobiles participated with 4 base stations being active. The overall coordinator was VE1AUT, EC Moncton area. Mobiles patroled a total of 2218 miles. SPARC have 25 enrolled in code classes while MAARC have 20. Many other clubs are running classes so there should be a bumper crop of new amateurs come early summer. Parts of VE1-Land experienced a severe ice, wind and snow storm on Oct. 20. Many of the lads and lasses lost antenna, tower, power, etc., but everything got back to normal in a week or two. The Pictou ARC operated VF1IV/1 during the Boy Scout Jamboree-on-the-Air. VE1NL, VE1AYI, VE1HH and VE1EJ operated keeping the station on the air despite losing a part of a 30-ft. mast during the storm. VE1AYI is awaiting a new FT 101B. Preparation is in full swing for the 1975 Convention in Moncton, VE1IG new EC for the Sydney area. During the first week of Nov, a mishap in Halifax knocked out telephone communications between a large number of cities in the Atlantic Provinces, an emergency net was set up on 3750, too many hams participated to list. APN reports QNI 153, QTC 119. Traffic: VE1AMR 161, VE1ARB 130, VE1ZH 75, VE1AAO 27, VE1AKB 19, VE1AWP 11, VE1KR 6, VE1ALB 5, VE1AFM 4, VE1AYJ 4, VE1ATG 4, VO1GW 4, VE1HJ 3, VE1AMB 1.

ONTARIO – SCM, Holland H. Shepherd, VE3DV – All amateurs, and the cw traffic men in particular, will be saddened to know that VE3DU London has joined the ranks of Silent Keys. Dave was an ex-SCM Ont. and had held an ORS appointment continuously since 1934. We also report the death of another OT cw man, VE3ANB of Strathroy. Our deepest sympathy to their families. The Carleton Univ. ARC has joined the ever expanding ranks of repeater sponsors with a brand new 2-meter job under VE3OCR [46.25/146.85. This club is a recent affiliate and notwithstanding their small numbers is a real going concern. Early risers will get a real insight into a unique export of Canada to the USA as a group of Ont. amateurs discuss their annual trek to Fla. and other points in the south. VE3UC and VE3AJP are two of this unique group and they may be heard on 3780 nearly any morning between 6 and 7 AM. A pleasant welcome to Life Members VE3GOG and VE3OT and an invitation to all Ont. Life Members of the League to join in, and support, the Ont. field activities by taking on a station or leader appointment in the phase of your choice. Ex-VE3DRV, ex-VE1ANF now back in Nation's capital with a new call VE3CMN. Jim is a Navi Commander with the DND and will be

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remembered as the former Editor of the OARC Ground Wave. Recent elections of the RSO saw two of the senior offices move to the Ottawa Valley as VE3SZ of Deep River became pres. and VE3CDM of Toronto and now Ottawa takes on 1st Vice-Pres. Hopefully this will tend to answer the criticism that RSO is too Toronto-based. A special welcome to new amateurs VF3s HIX, HOE, HOU, HMZ, HJF, HOF, HNA, HNS and HIP. Traffic: VE3SB 233, VE3GOL 176, VE3FQZ 112, VE3DPO 100, VE3AWE 81, VE3EHF 80, VE3GRR 73, VE3FRG 70, VE3DV 61, VE3GIG 61, VE3GFN 57, VE3CYR 48, VE3ASZ 37, VE3DVF 37, VE3FWD 37, VE3DH 14, VE3EHL 11, VE3FGV 9, VE3FHQ 9, VE3FBC 7, VE3ARS 2.

QUEBEC – SCM, Larry Dobby, VE2YU – SEC: VE2DEA, ECs: VE2BQK, VE2DKK; ORSs: VE2DR, VE2OJ, VE2UY, VE2ALH, VE2BYR, VE2DRC, VE2EC; OO: VE2BAQ; OBS: VE2DPO; OVSs: VE2APT, VE2BMQ, VE2YU. Would those of you who have current appointments which I have missed in the above list please contact me. SEC VE2DEA still looking for assistance from various clubs through the province in the formation of the AREC on a club basis. Anyone interested should contact VE2DEA immediately. A number of stations participated in the Jamboree-on-the-Air held in Oct. VE2EC sends in a photo of the Three Rivers group operating VE2JAM. Judging by the report received from VE2UN they certainly checked into a large number of nets. VE2UN improving their station capability, latest addition is an Alpha 77 and a fourth tower. They are supplying the students of McGill with a good traffic service. Congrats to VE2JZ who placed first in the July Open CD Phone Contest. The SCM was active in the SS contest either chasing or being chased by VE2AQP. Thanks for keeping me on. Conditions during the contest were excellent. Traffic: (Oct.) VE2UN 105, VE2DR 68, VE2BP 50, VE2DRC 44, VE2EC 8, VE2HY 4. (Sept.) VE2ALH 89, VE2OJ 88, VE2BP 58, VE2DR 49, VE2DRC 30, VE2EC 21, VE2BFL 20, VE2APT 15, VE2BED 13, VE2ATL 10.

SASKATCHEWAN – SCM, P.A. Crosthwaite, VE5RP – VE5NJ handled the NTS system for the Sask. section for most of the summer while VE5TT was farming. Our sincere thanks John for doing a fine job. VE5WM is acting Net Mgr. for Sask. section CW Net. Bill has set up cw classes in Regina for those who wish to brush up on their code. The Sask. VHF advisory group under the chairmanship of VE5DA are doing a fine job in working out frequencies in order that they will be compatible to the neighboring Provinces and the Northern States. If there any questions concerning VHF please contact Doug. Traffic: VE5DN 18, VE5BO 13, VE5XC 9, VE5RP 7, VE5SM 5. QST

"It Seems to Us. . ."

(Continued from page 9)

acclaimed ARRL's nomination of Noel B. Eaton, VE3CJ, as IARU president. He, along with ARRL/IARU Vice President W4KFC and Secretary W1RW, plus ARRL President W2TUK and staffers W1RU and K1ZND, traveled extensively during the year on four continents, consulting with IARU societies about preparations for the 1979 World Administrative Radio Conference, where new frequency allocations will be established. The two last-named also spent time at an ITU seminar in Geneva, making valuable contacts with communications administrators of developing countries. Meanwhile, FCC Commissioner Robert E. Lee announced, at the QCWA annual banquet, preliminary U.S. considerations for the amateur service which call for wider bands at 40, 20 and 15 meters; new bands at 10.1, 18.1 and 24 MHz; an end to sharing of the 80-, 40- and 20-meter bands; and full return of the 160-meter band to the amateur service.

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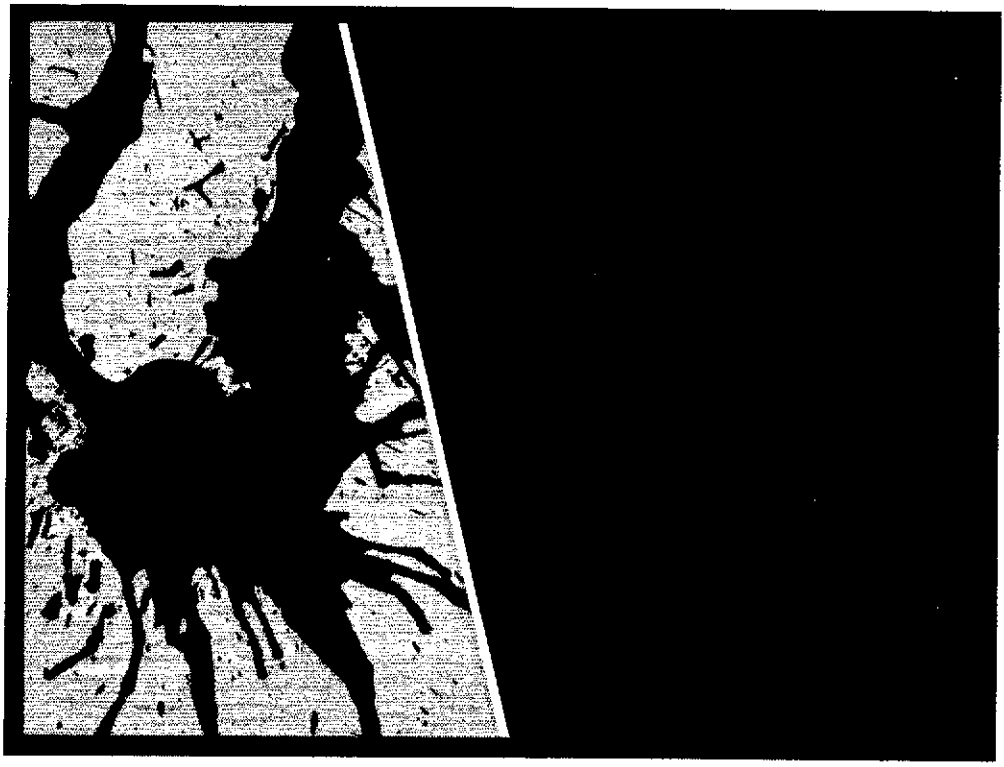

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together with heavy membership interest in, and use of, services provided at Hq., necessitated a dues increase effective January 1. U.S. members will pay $9 a year; Canadians $10 (it costs almost $1.90 more per year to send *QST* north across the border than to the States) and all others $10.50. Life memberships will be $180, $200 and $210 total (or $22.50, $25 and $26.25 every three months for two years), respectively. A consequence of the well-publicized rise in dues — adopted at the July Board meeting and announced immediately thereafter — has been another spurt in ARRL Life memberships: about 5,000 aboard now; nearly 2,000 working on the quarterly payment plan. There are also a large number of members who have paid in advance for a number of years at 1974 rates. The 1975 *Handbook* appeared on the scene in late November, some 2-1/2 months earlier than "normal," to meet the holiday gift season. A new organization appeared, too: The ARRL Foundation, formed to attract funds for special purposes beyond the regular activities of the League, such as support for the amateur-satellite program and scholarships for students who are amateurs. To date, some $36,000 has been received; up to $9,000 more has been pledged if it is matched by others, specifically for the Amsat/Oscar effort, part of a $25,000 challenge by "Pete" Hoover, W6APW and Bill Eitel, W6UF. Speaking of Oscar, the seventh satellite of that name was launched on November 15, 1974, and became operational on the 17th orbit as planned; some $38,000 in funds held by the League assisted! A ground control system developed for Oscar 6 (which, by the way, is still functioning well 15 months beyond its design life) earned the ARRL Technical Merit Award for VE3QB. While we've got our minds out in space, let's mention that a 1974 Nobel Prize in physics was won by G3CY (jointly with a colleague) for his work in radio astronomy. Back on earth but still talking space, the League has contributed a permanent exhibit on the amateur space program to the Kennedy Space Center in Florida, where it will be on view to as many as a million visitors a year. The NASA educational program is also supported with ARRL materials on Oscar, including a curriculum supplement for teachers. Intrafraternal relations were fostered by the ARRL National Convention, in New York City in July under the able management of the Hudson Amateur Radio Council, and by fourteen division, state and provincial conventions and untold area-wide hamfests. And in similar vein, the first IEEE amateur symposium was held in New York as part of the engineers' annual convention, and received high marks for the caliber of its presentations.

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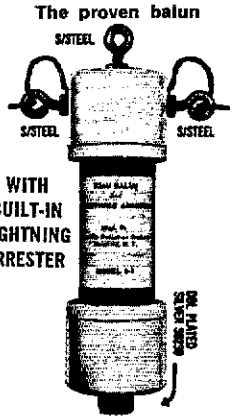

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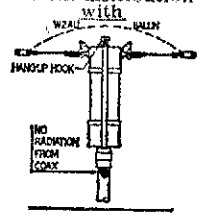

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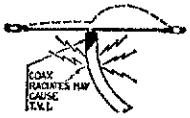

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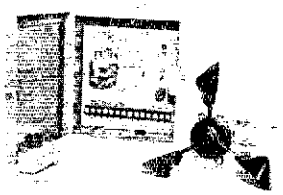

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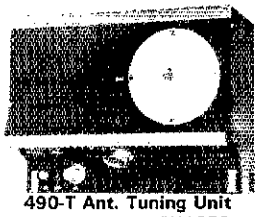

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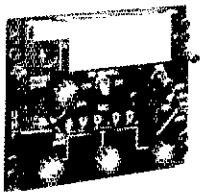

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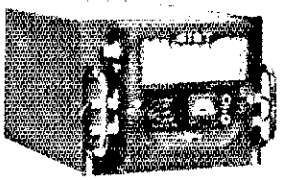

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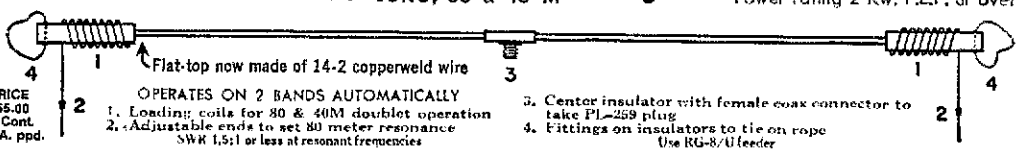

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year for amateur radio. May all of us, at headquarters and in the League's volunteer team of officers, directors, vice directors, SCMs and other officials, wish you an even better 1975! QST

Novice Roundup *(Continued from page 59)*

cannot be counted a second time as a foreign country. If you work 100 stations in 31 sections + 3 foreign countries and have an ARRL (not FCC) Code Proficiency credit of 10 wpm from W1AW or W6OWP, then your score is 100-plus-10 × total multipliers (31+3) or 34, for a total of 3740 points. For details on the Code Proficiency program, see OP-News of this issue. You may work DX stations for contest credit, a multiplier of 1 is earned for each separate foreign country worked.

Read the rules carefully. Keep a check-sheet of stations worked (we have Operating Aid †6 available free) so that you don't have duplicate QSOs. Log sheets, Op Aid 6 and a map of the United States are now available from your ARRL Headquarters. *Unless first-class postage is included with your request, log sheets will be sent by third-class mail.* To aid us in getting these forms to you as quickly as possible, please be sure to include with each request a self-addressed and stamped envelope containing: your full name, call and mailing address complete with Zip code. We suggest a minimum of 10 cents postage attached. This will assure your receiving 3 log-sheets (enough for 300 QSOs), 1 Op Aid 6 and a WAS map (if desired). Using this as a guideline, you can adjust the postage according to the number of logs you anticipate needing.

B C N U in the NR! — *WA1PID*

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of *QST*.

2) *Time:* All contacts must be made during the contest period starting at 0001 (12:01 A.M.) Greenwich Mean Time on the first Saturday of February and continuing until 2359 (11:59 P.M.) Greenwich Mean Time the second Sunday of February. Time may be divided as desired but *must not* exceed 30 hours total. Off periods *may not* be *less than* 15 minutes at a time. Times on and off *must* be entered in your log.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs may take place on the 80-, 40-, 15-, or 10-meter bands. Crossband contacts are not permitted. Novices work any amateur stations; non-Novices work Novices only. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your RST and section and receipt of a RST and section/country. A station may be worked only once, regardless of band.

A Novice may operate in the Novice portion of the competition until he receives his General Class license, then he must participate as a non-Novice only.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The number of ARRL sections (see page 6 of any *QST*) + foreign countries worked during the contest is the "total multiplier." Yukon-N.W.T. (VE8) also counts as a multiplier. A fixed scoring credit may

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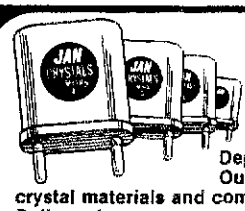

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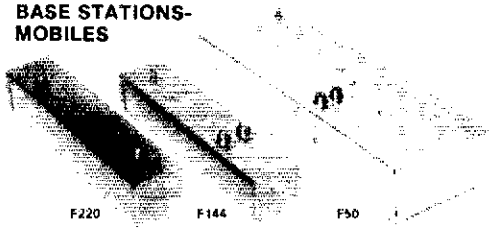

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be earned by entrants who hold the ARRL Code Proficiency certificates. FCC code credit *cannot* be used in lieu of the above. If an entrant does not hold a ARRL Cp Award, he can apply for credit by attaching to his Novice Roundup report a copy of the qualifying run from W1AW or W6OWP for January or February. Cp credit equals the wpm speed indicated on the latest ARRL certificate or sticker held by the entrant. The final score equals the "total points" plus "ARRL Code Proficiency credit" multiplied by the "total multiplier."

5) *Reporting:* Contest work must be reported on forms from the ARRL. Reporting forms and a map of the United States will be sent free upon request. Indicate starting and ending times for each period on the air. All NR reports become the property of ARRL and none can be returned. Entries must be mailed to ARRL Hq., 225 Main St., Newington, CT 06111 no later than March 5, 1975.

6) *Awards:* A certificate will be given to the highest scoring Novice in each ARRL section. Multioperator or General-class licensees and above are not eligible for awards. However, a box containing the TOP TEN W/VE higher-class licensees will be incorporated in the results. And should participation warrant, a similar box will show TOP TEN DX enterants.

7) *Disqualification:* If the claimed score of a participant is reduced by 2 percent or more, the log may be disqualified. Score reduction does not include correction of arithmetic errors.

Score reductions may be made for taking credit for unconfirmed QSOs and/or multipliers, duplicate contacts, banned countries, and/or other scoring discrepancies.

If a participant is disqualified, he will be barred from submitting an entry in the next annual running of that specific contest, (e.g., disqualification from the 1972 phone SS prohibits submission of an entry for the 1973 phone SS, but 1973 cw SS participation is okay).

The calls of all disqualified participants will be listed in the *QST* report of the contest.

Any participant on the borderline of disqualification but not actually disqualified may receive a warning letter from the Communications Manager.

For each duplicate contact that is removed from the log by Hq., a penalty of 3 additional contacts will be exacted. The penalty will not, however, be considered as part of the 2% disqualification criteria.

In all cases of question, the decisions of the ARRL Awards Committee are final. QST

Public Service

(Continued from page 65)

search for three hours. The man returned home the next day. (WA3OKK, EC Washington Co.)

■ Sackville, NB — Oct. 27. VE1ACA called VE1SH on repeater VE1RPT when he saw a car go into the ditch. There were no injuries but a tow-truck was needed. — (VE1SH, SEC Mar.)

■ Sussex, NB — Oct. 30. While traveling on the Trans-Canada Highway, VE1AXE saw a truck in a ditch. He called VE1ST through VE1RPT who called police. — (VE1AUT, EC Moncton)

■ Moncton, NB — Oct. 31. During a Halloween Witch Patrol, AREC members reported burning buildings, accidents, burning cars, blocked roads and malicious happenings. Seventeen mobile units were out and four base stations were set up at fire halls and police headquarters and used repeater VE1RPT. — (VE1AUT, EC Moncton)

■ Monroeville, PA — Nov. 1. K3ISO/mobile 3 came upon a truck that was losing canisters out of

the back. He called via WR3ACH for help and W3HTH informed police. – (K3ISO)

■ Moncton, NB – Nov. 1. VE1AUT/mobile 1 came upon a car-motorcycle accident. He called via VE1RPT and VE1SF responded and called police. – (VE1AUT, EC Moncton)

■ Murrysville, PA – Nov. 2. K3CML called for emergency phone patch traffic on WR3ACH when he witnessed an automobile accident. He was answered by W3MIF while K3ISO dialed the police. – (K3ISO)

■ Vicksburg, MS – Nov. 2. While traveling in a motor home, W8ZKL became stranded when the fuel pump broke. He checked into the Midwest Amateur Radio Service and WB4QNK called police for him. – (WA9MZS)

■ Seven Owensboro (KY) amateurs began coordinating a search for a missing boy, on Oct. 27, for the c.d. Equipment was gathered and amateurs alerted just as the boy called home reporting he had been abducted but released unharmed. – (W4OYI, Asst. Dir.)

■ *Special Events May.* A communications link was set up between the central office of the Heart Fund and temporary hypertension clinics in May, at Shreveport, LA. Area amateurs handled traffic via two meters. – (WB5HXD) *July.* Nine Vancouver (WA) area hams coordinated a Fort Vancouver Fourth of July celebration. A network of 6 two-meter rigs was set up. – (W7BG) *August.* Austin (TX) amateurs provided communications for the Aqua Festival Ski Tournament held on Aug. 2-11. Eight hams participated. – (WA5MUM). The Ohio State Fair had 22 amateurs operating station WO8HIO from Aug. 22 to Sept. 2. Close to 400 messages were passed throughout the U.S. with the help of the Buckeye Net and overseas via MARS circuits. – (WB8IBZ) *September.* The Toronto (ON) FM Society assisted by AREC members, provided communications for the Canadian Equestrian Championships held Sept. 7. A portable station and several mobile units were set up, and one emergency message was sent when an ambulance was needed. – (VE3GFN). A portable repeater was put on display Sept. 13-22, at the Eastern States Exposition in W. Springfield, MA. Weather information and messages were relayed by a link-up with WR1ACY. – (WA1OPB) The Central Ohio AREC provided emergency communications for the American Cancer Society Bike-a-thon, on Sept. 15. Seven bicycle routes and 350 riders were monitored and the use of WR8ABV enabled a portable station at each route to remain in contact with each other. – (WB8INY) A two day fund-raising was held Sept. 20-21 for the Canadian Cystic Fibrosis Foundation. Members of the Winnipeg Repeater Society, VE4XK, assisted with communications. – (VE4FQ) On Sept. 28, Glens Falls, NY, AREC members provided communications for the Fall Festival White Water Races. WA2PCK directed operations. – (K2AYQ) *October.* Washington, PA, area amateurs provided communications on Oct. 10 for a walk-a-thon. Check points were manned as well as busy intersections along the routes. – (WA3OKK) Fifteen members of the Glens Falls, NY, AREC set up communications on Oct. 12-13 for the Adirondack Hot Air Balloon Festival. A new communications trailer and a spotter plane equipped with 6-meter equipment were utilized. – (K2AYQ) On Oct. 13, Mount Beacon (NY) ARC members provided communications for a bike-a-thon sponsored by the Dutchess Co. Heart Chapter. Communications were through WR2ABB. – (WB2CJS) On Oct. 19, amateurs operated at several checkpoints along a 15-mile horse trail in Genesse Co., MI, for an American Lung Association Horse-a-thon. Progress of riders and any emergencies were reported. – (WA8THK) Queens RACES and AREC members furnished communications on Oct. 19, for New York City (NY) Auxiliary Police Day. Six-meter equipment was utilized for the ceremony. – (WA2ZHA) Three mobile units and one base station were set up on Oct. 20, in Ottawa, ON, for

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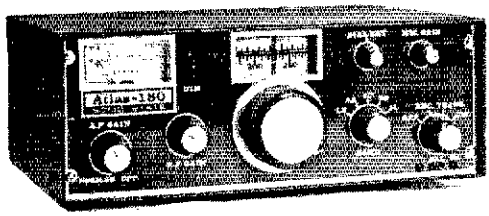

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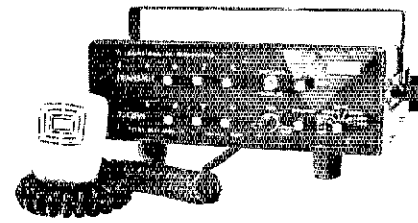

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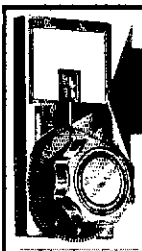

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the Telephone Pioneers Car Rally. Four amateurs kept track of progress and scores. – (VE3CRX) Safety communications were provided for the Motorsport Club Speed Trails on Oct. 20, at Ottawa, ON. An ambulance was at hand in the event that one of the amateurs saw an accident. – (VE3CRX) Eleven two-meter mobile units were watching for vandalism in Howard Co., MD, on Oct. 31. Repeater WA3DZD was used and a base station was set up at police headquarters. A teenager was seen shooting at cars with a rifle and was reported. – (WA3SWS) A Halloween patrol was held in Plattsburgh, NY, on Oct. 31. RACES/AREC members set up mobile units to report any vandalism to a base station set up in police headquarters, via WR2ADL. – (WA2HSB) Twelve Colbert and Lauderdale Cos. (FL) area amateurs held a Halloween Safety Patrol on Oct. 31. A base unit was manned at the police station and mobile units were assigned to areas and several incidents were reported. – (K4CUU) The Centre Co. (PA) Area AREC net activated to provide police with assistance on Halloween. Six mobiles cruised the area and 9 amateurs took part using WR3ACY. – (W3ZUH) *November.* Columbia ARA and Anne Arundel RC members jointly coordinated a boat race for Chesapeake (MD) Appreciation Day. On Nov. 2, amateurs manned two meter portables and mobiles dispatching police boats when needed. – (WA3SWS) Twenty-seven Chesapeake, VA, area amateurs provided communications for out lying precincts on Nov. 5. Through WR4ACN, RACES repeater, they kept voters informed with figures from the General Registrar's Office. – (WA4BUE) QST

Happenings of the Month

(Continued from page 75)

2. The reassurances offered that the HIRAN system will operate on a non-interference basis with the amateur service, and that it will be the responsibility of the operator of the HIRAN system to take "appropriate corrective measures" should interference occur, are not persuasive. The text of the Commission's proposal contains no details of the technical parameters of the system, such as the occupied bandwidth, transmitter power, antenna size, and directivity, etc. It is unreasonable to require individual amateurs to spend portions of the limited time and resources they have available for amateur radio identifying the source of interference and reporting such interference to the Commission. Further, the history of frequency management in the United States indicates that target dates for the removal of a "temporary" user from an assigned band are often optimistic.

3. If the Commission should decide, nevertheless, to assign this non-Government radiolocation service to the 420-450 MHz band, we urge that certain restrictions in addition to those proposed be placed upon HIRAN operation. The purpose would be to hold to a minimum the likelihood of harmful interference to the amateur service. To adopt such restrictions will be to the direct benefit of the HIRAN operator, as it will reduce the likelihood of his having to take steps to resolve interference complaints.

4. The range of frequencies from 431 to 438 MHz is heavily used by amateur stations engaged in weak-signal experimental work. This work is extremely vulnerable to interference; should a HIRAN station operate in these frequencies, it is virtually certain that harmful interference will result. Even geographical separation from population centers would not solve the problem, at least in the case of the amateur satellite Oscar 7, which

utilizes a sensitive receiver in the 432.1-432.2 MHz range.

5. The segment to which the Commission has restricted amateur repeater operations, 442-450 MHz, is also heavily used by amateurs using fixed-frequency techniques which make it impractical to change frequency to avoid interference. In this range, amateurs have agreed voluntarily to coordinate amongst themselves their use of frequencies so as to minimize interference and to make the best possible use of this spectrum. For the Commission to restrict the rapidly-expanding repeater operations to a particular segment of the band, and then just two years later to permit a new non-amateur service to operate therein, would constitute a substantial setback to the Amateur Radio Service.

6. Therefore, if the Commission proceeds to adopt its proposal despite our opposition, we earnestly request that the regulations with respect to HIRAN prohibit its operation in the 431-438 segment of the 420-450 MHz band, and hopefully 442-450 MHz as well, as such a prohibition will serve the interests of both the established user of this spectrum, the amateur service, and the HIRAN operator.

7. These comments should not be construed as a guarantee that the use of other parts of this band by HIRAN will not result in complaints of interference from amateurs. Amateur television operation takes place in various parts of the band, depending on local operating patterns. Point-to-point links utilizing auxiliary link and control stations also populate those portions of the band not already mentioned. While these circuits usually use directional antennas, the receiving end of the link is often in a very high location and the transmitter is required by Part 97 of the Commission's Rules to use a minimum of power. These circuits are also susceptible to interference, and often are used in networks of stations whose purpose it is to provide reliable communications over moderate to long distances in emergencies.

8. In summary, we do not believe that the extent of potential interference to the amateur service from HIRAN is clearly understood by the HIRAN operator or the Commission, and we strongly urge that this proposal for the sharing of the 420-450 MHz band with a non-Government radiolocation service not be adopted. However, should the Commission decide to proceed, it should restrict the operating frequencies of the HIRAN system to those portions of the band where the likelihood of harmful interference to the amateur service is somewhat less.

Respectfully submitted,
THE AMERICAN RADIO RELAY LEAGUE,
By Robert M. Booth, Jr.
Its General Counsel
November 4, 1974

Docket 19723

(Continued from page 72)

of the large number of suggestions, proposals and objections is not practical. Therefore, the following comments are limited to a relatively few of the most important matters under consideration.

RACES Must Be An Amateur Service

. . . 3. Some of the comments vividly point out a condition which has greatly concerned the League and amateurs for many years, i.e., that some

RACES operations are little more than extensions of local government networks operated primarily by non-amateurs on amateur frequencies for non-emergency purposes under the guise of drills. Such operations are on fixed frequencies, freqently at fixed times, and with little or no regard to interference to legitimate amateur operations. Such operations should and must be conducted outside the amateur bands. . . The abuses must be halted. . .

5. One of the points raised in many of the comments is that a licensed amateur radio operator may not be available at the control station to activate the RACES network should a disaster strike. Respondents have argued that a commercial radio operator should be permitted to operate under such circumstances. The answer appears rather simple. Let the commercial operator obtain an amateur operator license as well. Few Radiotelephone or Radiotelegraph First or Second Class Operators would have any difficulty in obtaining an amateur license of at least a Technician or General Class as many of the elements of the examinations are similar in scope and content. In fact, a significant number of persons already hold both amateur and commercial operators' licenses.

One-Hour Drill Limitations Should Be Relaxed

. . . 7. The League, in its comments, as well as many respondents have recommended that the one hour per week limitation on drills be relaxed. One of the bases for the League's recommendation is that many RACES organizations participate in the League's annual Simulated Emergency Test, a nationwide annual weekend emergency exercise conducted for the purpose of testing amateurs' preparedness under simulated emergency conditions. Further, the sizes of RACES networks often vary directly with the population of the governmental body. The League renews its recommendation that the proposed time limitations be relaxed to permit participation in SET and more realistic drills or, in the alternative, that the last sentence of proposed Section 97.191(b) be deleted.

Tactical Call Signs Should Be Abolished

8. A number of respondents have opposed the proposed deletion of tactical call signs, contending that the time required for transmission of the complete amateur call sign of each participating station would be so great as to seriously impair the effectiveness of the operation. In time of wartime operation under Section 606 of the Communications Act of 1934, as amended, the use of tactical call signs may be essential. But in peacetime, use of tactical call signs not only prevents the traditional self-policing by amateurs but also limits participation of amateur stations who have emergency traffic to handle and stations in locations with which communications are urgently required.

9. A suggestion has been made that the objections to use of the full amateur call might be overcome by use of only the two or three-letter suffix during most operations with the control station using its complete call. At regular intervals, the full call sign of each station would be transmitted. The Commission is urged to consider such a compromise solution.

Technicians Should Not Be Excluded

10. The tremendous growth in repeater activity in the vhf and uhf bands in recent years has provided an entirely new opportunity for effective emergency communications by amateurs. Many of those operating above 144 MHz are Technicians.

Such operators have been just as effective in times of emergency as higher class operators. Further, Commission spokesmen have publicly stated that a revision of operator classes is under consideration and soon may be issued for comment by a Notice of Proposed Rule Making. It is suggested that the matter of participation by Technicians in all phases of RACES be carefully considered as a part of the forthcoming license restructuring proposal. . . .

QST

World Above

(Continued from page 87)

nice when you're working with good signals, but the mobile station frequently runs into areas where the level drops enough for the squelch to take over and chop out a few key words. Reaching for the squelch control to bring the signal back in is rarely convenient, and may not even be safe, if the operator is driving. Carl rigged a momentary-contact switch on his microphone, to disable squelch action in his receiver at such times. It takes no more than two wires, and often can be done with one. It's an effective remedy for a common problem.

WB4BSZ, Pensacola, FL, confirms exceptional E_s during October, with 50-MHz skip on Oct. 8, 13, 16, 21, 26 and 27.

WB2LAI/4, Chesapeake, VA, says that activity on the Tidewater SSB Net (see W3GOA, above) is growing steadily. Fall tropo extended the net coverage to include W4LZW, Greenville, SC, Oct. 8. WB4RVU, Richlands, NC, is a new "louden-boomer," with 700 watts into an 11-element 48-foot Yagi, running S9 in the Tidewater area, over a 150-mile path.

Increasing 6-meter interest and activity is an objective of the recently formed North Carolina Six-Meter Association. Membership is confined to that state only, but checkins are welcomed from everywhere when their net is convened at 0900 local time each Sunday morning, on 50.12.

WA6UAM reports that so far 18 different stations have checked into the Micronet (West Coast Microwave Net), which meets at 2030 Pacific Time Tuesdays, on 1296.01 MHz. Paul says that 220 fm usage is growing rapidly in the Bay area and environs, and that problems are developing with overlapping frequency usage. Radar and TV interference tend to "narrow" the 220 band in California, complicating the selection of frequencies.

K7CVT, Tucson, AZ, finds almost daily activity on 145.005, ssb, at 0300 UT. Sunday operation on the same frequency, at 1500 UT, includes W7LFX, K7NEQ, WA7BBM, WA7KCA, and WA7AQD in Tucson; W7RUC, W7HZJ, and W7VCM in Sierra Vista; WA7FPO, W7GBI, WAØKDS/7 in Phoenix; WA7FLB in Cordes Junction and K9DKW/7 in Kingman.

W4WNH/8, Clio, MI, has worked WA7KYZ, VE2DFO, and W6PO via 144-MHz EME, even though Shelby feels that his array of 4 16-element KLM Yagis is not quite right, yet.

K9KQR, Libertyville, IL, has followed the same solar activity area through at least three 27-day cycles. He was one of our better reporters of the Sept. 15-16 aurora. Dick worked Ohio, Michigan, Illinois, and Nebraska on 2-meter aurora Oct. 13, between 0305 and 0603 UT, and then a rarity, WØRLI, at 1630 UT. This may be the farthest into the daylight hours that we've heard of auroral propagation being observed, at least in our lati-

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THE AMERICAN RADIO RELAY LEAGUE, INC., NEWINGTON, CONN. 06111

tudes. Anyone else have daylight-hours aurora experience, other than with those rare sessions that have begun in early afternoon? More aurora developed around 2300 Oct. 16, lasting only briefly then, but coming back about 0420 Oct. 17, for nearly an hour. The third time around for this batch of solar activity came Nov. 12, with auroral signals strong on 144 MHz between 0420 and 0450 UT. A feature of the Oct. 13 session was a shift of most-effective beam heading from 10° east to about 15° west in some four minutes, around 0458. K9KQR kept Leonids skeds with K1WHS Nov. 16 and 17. He heard the Maine station well many times the first day, but they did not complete a QSO until a 25-second burst at 1206 UT the 17th.

As a means of filling in the customary winter low in vhf activity, WØOHU, Rochester, MN, and others have been playing with QRP rigs on 144. (This is real QRP, in the low-milliwatt level, ssb, not the "high-power" QRP sometimes touted on the hf bands.) Distances of 75 to 150 miles have been covered fairly often, and one 270-mile contact has been reported when things were good. One thing is readily apparent from this game: both receiver and antenna must be *right*, for real QRP success.

W1JAA 432-MHz Preamplifier – Update

The low-noise 432-MHz preamplifier by W1JAA, described in this space in November, 1972, *QST*, has been duplicated widely by the EME fraternity. Results have been generally very good, but some "modifications" have caused problems.

The amplifier has a broad response, typically 20 to 450 MHz, with little change in noise figure. Some external selectivity will thus be needed in areas where there are strong signals within this passband. A high-Q coaxial or cavity filter is recommended, preferably silver-plated. Interdigital or comb-line filters may have high insertion loss or passband ripple, because of the high input SWR of the preamplifier. Any filter should be tuned for minimum loss in a 50-ohm system, and then placed in the preamplifier line with no further adjustment.

Original parts values and circuits should be used, unless equipment is available for measuring noise figure accurately when any change is made. For example, the hot-carrier diode, CR1, connected base-to-ground in the original circuit, not only prevents burnout of the amplifier transistor; it also contributes capacitance to the input matching network. Noise figure will rise if the diode is removed, and conventional germanium or silicon diodes may cause troubles. Any hot-carrier diode with 0.5 to 1 pF capacitance should do.

Intermod problems have been traced to paint on surfaces where parts of the aluminum box are joined. Be sure that there is clean metal-to-metal contact at mating box surfaces.

Other transistors than those specified have been used with varying degrees of success. The NEC V766 (2SC1366) should work well. Any substitute should have an Ft of 2 GHZ or higher and a low noise figure, and may require different collector current for best noise figure. Other values than 620 ohms should be tried for the emitter resistor of Q2. Adjustment of the inductance of L1, and/or use of a 3-pF trimmer across the input connector or CR1 may help. Make any changes or adjustments only with the aid of quality noise-figure measuring equipment.

Slightly lower noise figure, and more bandwidth, can be obtained by increasing C1 from 20

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The DKB-2010 is available assembled or in kit form. Should you choose the kit, you'll find construction easy — the unit consists of three assemblies: power supply board, logic PC board, keyswitch PC board, and pre-assembled wiring harness.

Any way you look at it — as an easy-to-build kit, a complete assembly, as a CW keyboard, or an RTTY keyboard, the HAL DKB-2010 is a real breakthrough for every amateur. It adds a whole new dimension to the exciting world of amateur radio. Once you've used the DKB-2010, you'll wonder how you ever got along without it!

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The HAL DKB-2010 dual mode keyboard is another example. It allows you to transmit TTY or Morse—TTY at all standard data rates, and CW between 8 and 60 WPM. You also get complete alphanumeric and punctuation keys, plus 10 other function keys, a "DE—call letters" key and a "QUICK BROWN FOX..." diagnostic key. In both modes you have a three character buffer for bursting ahead (larger buffers optional); and in the CW mode you can adjust the dot-to-space ratio (weight) to your liking.

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to 100 or 150 pF. Lower noise figure and narrower bandwidth result from replacing the 3300-ohm resistor in the base lead of Q1 with an 0.47-uH rf choke. Lower inductance in L2 will raise the upper frequency limit, if this is wanted.

The recommended transistors are available currently from California Eastern Labs, One Edwards Court, Burlingame,CA 94010. Prices are 2N5652 — $14, 2N5650 — $21, 2N5650 — $29, including mailing. California residents add 5 percent sales tax on $1 less than the above amounts. The original *QST* issue, January, 1972, is still available from ARRL Headquarters, Newington, CT 06111, $1 postpaid.

Those States-worked Boxes

The first tabulation of states worked on a vhf band ran 23 years ago this month, it having become apparent that before long somebody was going to work all states on 50 MHz. WØZJB qualified for the first special 50-MHz award a few months later. Meanwhile, the 2-meter crowd started agitation for recognition of their work, so we had a 2-meter box before the year was over. Developing activity on 220 and 420 soon called for something similar for those bands, and in 1959 we ran our first two-band states box, with 30 entries in about two column inches of space. Now we're even running a 1215 box occasionally, and it carries some quite impressive statistics.

It was felt that the tables for 144 MHz and up should be capsule summaries of achievement on those bands, so states, call areas, and best DX in miles were included. To make the listings meaningful a certain level of achievement was selected arbitrarily for each call area, and except for the call area leaders continued activity and/or reporting were required. This explains retention of some long-inactive calls, while there has been continuous attrition on the lower listings. We've dropped some calls in the box herewith. If you're not there this month, it could be that we've not heard from you in a long time. How about sending us the latest figures, if you're still climbing the states ladder on any of the listed bands. No need to send cards, just a list of stations worked, with dates, to support your claim — except for the special 50-MHz WAS award. Proof of contacts and compliance with WAS award rules, are required for 50-MHz listing.

The list of 50-MHz WAS holders was last run in the March, 1974 issue. Since then, WA7FLB received award No. 121, WB6HQU 122, WA6OAX 123, WB6RMB 124 and K6QHC 125. Congratulations all hands. That we've had only 125 awards since 1948 shows that 50-MHz WAS is no push-over.

QST

Op News

(Continued from page 94)

new. QST FMT presentation. – WA5ZBN. Equipment here is simple: a marker osc. homemade 4000 kHz crystal using a HEP 801 FET and an HEP 50 follower into a divider circuit down to 1 kHz; VFO, a clapp circuit FET HEP 801 to an HEP follower, also homemade; receiver, Drake R4B. W2JDC. This might be a long ways off as I found my trimmer cap on the calibrator doesn't work, so guesstimated using only an FT-101 with a calibrator close to WWV on 15 MHz. WB6RMG. Hope I came close! Had to try out my new boat-anchor receiver (R-390A) to see how accurate it really is. Thanks for the fun. – WA9PVS. Readings made using only an FT-101 and its internal calibrator, estimating zero beat of the signal and two calibrator marks to 1/10 kHz visually. A linear correction was made using the two calibrator points, 25 kHz apart, one on either side of the signal. No digital counting equipment was used. – WA6WXH. I'd like to see QST carry some technical material on measurement techniques. Thanks again for the run. – W8DOP.

CU in February! – W7YZ.

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 post office box or telephone number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 50 cents 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 15 cents per word will apply to advertising which, in our judgement, is obviously non-commercial 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 15-cent rate. Address and signatures are charged for, except there is no charge for zipcode, which is essential you furnish. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 50-cent 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 advertisement, nor more than one ad in one issue.

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

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.*

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ROCHESTER, N.Y. — Hamfest date for 1975 — May 31st. Marriott Inn is new headquarters. Information? Write WNY Hamfest, Box 1388, Rochester NY 14603.

DAYTON Hamvention at HARA Arena April 25, 26, 27, 1975. Program brochures mailed March 10th. Write for information if you have not attended the last two years to HAMVENTION, P.O. Box 44, Dayton OH 45401.

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VERY in-ter-est-ing! Next 5 big issues $1. "The Ham Trader," Sycamore IL 60178.

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 Raehn, Orlando FL 32806.

WANTED: tubes, transistors, equipment, what have you? Bernard Goldstein, W2MNP, Box 257, Canal Station, New York NY 10013.

QSLs??? Made-to-order!!! Samples 50c. DeLuxe 75c. Religious 50c. (Deductable). Sakkers, W8DED, Box 218, Holland MI 49423.

PICTURE QSL cards of your shack, etc. from your photograph or art work. 500 — $13.50, 1000 — $18.25. Also unusual non-picture designs. Generous sample pack 35c. Half pound of samples 65c. Raum's, 4154 Fifth Street, Philadelphia PA 19140.

3-D QSLs — Far more spectacular, little more cost. Samples 25c (refundable). 3-D QSL co., Monson 2, Mass. 01057.

TRAVEL-PAK QSL Kit — Send call and 25c; receive your call sample kit in return. Sameo, Box 203, Wynantskill NY 12198.

FREE Samples—Stamp appreciated. Samcards, 48 Monte Carlo Dr., Pittsburgh PA 15239.

QSLs, samples 10c. Fred Leyden, W1NZJ, 454 Proctor Av., Revere MA 02151.

QSLs 300 for $4.65, samples dime, W9SKR, Ingleside IL 60041.

QSLs "Brownie" W3CJI, 3035A Lehigh, Allentown PA 18103. Samples with catalog 35c.

DELUXE QSLs, Samples 20c. Petty, W2HAZ, P.O. Box 5237, Trenton NJ 08638.

DON'T buy QSL cards until you see my free samples. Fast service, economical prices. Little Print Shop, Box 9848, Austin TX 78757.

QSLs, 300 for $4.95. Others equally low priced. Samples 20c. Colourcard, Box 326, Topanga CA 90290.

FRAME Display, and protect your QSLs with 20 pocket plastic holders. 2 for $1, 7 for $3, prepaid and guaranteed. Tepabco Box 198T, Gallatin TN 37066.

QSL, SWL, WPE cards. Samples 25c. Log books, file cards, decals, Malgo Press, Box 375, Toledo OH 43691.

QSLs. Second to none. Same day service. Samples airmailed 25c. Include your call for free decal. Ray, K7HLR, Box 331, Clearfield UT 84015.

QSLs — Variety, value, quality, custom. Samples and catalog 20c. Alkanprint, Box 3494, Scottsdale AZ 85257.

RUBBER stamps $2.50 includes postage. NJ residents add tax. Clints Radio, W2UDO, 32 Cumberland Ave., Verona NJ 07044.

QSLs from "Bullett," creative designs, fast service, economical. Send 20c for samples to Bullet Printing Co., Box 3033, Waco TX 76707.

QSLs catalog. Samples 35c. Ritz Print Shop, 5810 Detroit Ave., Cleveland OH 44102.

COMPLETE 36 page QSL catalog! 300 cuts, stock and ink samples. Ten sample QSLs, 25c. Cornelison's, 321 Warren St., N. Babylon, NY 11704.

QSLs 3 color glossy $4.50, samples 10c. Rutgers Vari-Typing Service, Thomas St., Milford NJ 08848.

CREATIVE QSL cards. Personal attention. Imaginative new designs. Send 25c. Receive catalog, samples. Wilkins Printing, Box 787-1, Atascadero CA 93422.

CANADIAN Surplus Catalog and flyers $1. Etcox Electronics, Box 741, Montreal Canada H3C 2V2.

WE BUY electron tubes, diodes, transistors, integrated circuits, semiconductors. Astral Electronics, 150 Miller St., Elizabeth NJ 07207. (201) 354-2420.

MOBILE Ignition Shielding gives more range, no noise. Kits and custom systems. Literature. Estes Engineering, 543-A West 184th, Gardena CA 90248.

P.C.'s. Send large s.a.s.e. for list. Semtronics, Rt. 3, Box 1, Fellaire OH 43906.

TELETYPEWRITER parts, manuals, supplies, equipment. Toroids. S.a.s.e. for list. Typetronics, Box 8873, Ft. Lauderdale FL 33310. W4NYF. Buy parts, late machines.

MANUALS for ham gear before 1967. Large s.a.s.e. for quote on specific manuals. WØ JJK, Hobby Industry, Box Q864, Council Bluffs IA 51501.

WANTED: An opportunity to quote your ham needs. 35 years a ham gear dealer. Collins, Drake, Ten-Tec, Swan, Kenwood, Tempo, Clegg, Regency, Icom, Hy-Gain, and all others. Also $25,000 inventory used gear. Request list. Chuck, W8UCG, Electronic Distributors, Inc., 1960 Peck St., Muskegon MI 49441. (616) 726-3198. Telex 22-8411.

PAYING 5% over best offer for any 618T, 490T, ARC51, GRC106. Any Collins item or Eimac tube. The Ted Dames Company, W2KUW, 308 Hickory Street, Arlington NJ 07032 (201) 998-4246, or 998-6475 nites.

WANTED: HQ180AC Swan 600T 600R CE200V Bird 43 TV test equipment fm generator. Waskowitz, W2KPF, 35-30 73 St., Jackson Heights NY 11372.

HOMEBREWERS: Stamp brings list of high quality components. CPO Surplus, Box 189, Braintree MA 02184.

SWAP-N-Sell ads free in Tradio. Box 4391, Wichita Falls TX 76308.

TOROIDS: 44 and 88 mhy 5/$2.75 P.P. M. L. Buchanan, P. O. Box 74, Soquel CA 94073.

MASONIC hams invited to contact Eric R. Towse, WA2TOA, 643-74 St. Bklyn NY 11209.

WANTED: Cash for a good automatic voltage regulator, also a good transceiver. Albert, 304 East Courtland, San Antonio TX 78212.

THUMPING Kegers Net meets every night 3927 kc.

WANTED: Hallicrafters SX-88 for parts, any condition considered. KØ MNA, 4805 Sullivan, Wichita, KAN 67704.

NOW PAYING $2000 and up for ARC-94/618T ARC-102/618T, $1200 and up for ARC-51BX $1500 and up for 490T-1 antenna couplers. We also need these control boxs-C-6287/ARC-51-BX, C-6476/ARC-51BX, C-714E-2. We also need R-1051 receivers, RT-662/GRc-106 transceivers. We buy all late aircraft and ground radio equipment. Also pack radios. We are buyers not talkers. Bring your equipment in you are paid on the spot. Ship it in you are paid within 24 hours. We pay all shipping charges. If you want the best price for your equipment, call us. D&R Electronics, R.D. 1, Box 56, Milton PA 17847. Phone 717-742-4604, 9:00 am - 9:00 pm.

SELL: ROBOT SSTV Model 80 camera and Model 70 Monitor. Original cartons and instruction books. Excellent condition. $600. Gordon Buckner, WØ VZK, Box 721, Marshall MO 65340.

CLEGG FM-27Bs at prices I dare not publish. WØ NGS, Bob Smith Electronics, 1226 9th Ave. North, Fort Dodge, Iowa 50501. (515) 576-3886.

PREPARE for FCC Exams! Use Posi-Check. Original, expertly devised, multiple choice questions and diagrams covering all areas tested over in FCC exams. IBM sheets for self testing. Keyed answers with explanations. General, including section on new Rules and Regulations — $5.10; Advanced Class — $4.65; Extra Class — $4.90; Novice, — $3.35. First class postage prepaid U.S.A. Air mail 25c extra per copy. Now also new Posi-Check for Radio Telephone Third Class, elements 1, 2, and 9 — $9.50. Send check or money order to Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines IA 50322.

BIRD Thruline wattmeter elements and line sections Wanted. Tony Gold, PO Box 614, New York NY 10028. (212) 427-2132.

WANTED: Gonset 903A Power Amplifier. K4IGB, 6117 Learay Dr., Greensboro NC 27410. (919) 294-4247 collect after 6 PM.

HEATH SB-303 receiver — $275; SB-200 linear — $250 (new tubes); SB-610 Monitorscope — $60; HD-10 keyer and AKRL relay unit — $35; HM-15 SWR bridge — $12. All gear 12 to 20 months old, built by ex-Heath employee. Equipment is perfect, must sell — moving to apartment. WA2KJT, 8 Chamberlain St., Rye NY 10580. (914) 967-0807.

NEED: Collins front escutcheon plate and tuning knob, regardless of model number engraving, prefer KWM2-A plate, but will take any in good condition. Also, need Collins cabinet. Paul Girard, KP4CB, Verbena 1675, Rio Piedras, Puerto Rico 00927.

TRADE: Gonset G-50 Transceiver, on the air condition, plus Cash, Want new kit AD — 1530 or SB 313. WAØGYX, George, 1107 No. Scott, Belton MO 64012.

COLLECTOR is interested in books, autographs and other information on early radiotelephone pioneers. Ronald Phillips, 1925 Baltimore, Kansas City MO 64108. (816) 842-9009.

WANTED: Master mobile matcher and micro Z-match. S. Kriso K2OMP, box 3338, Wallington NJ 07057.

FOR SALE: National NCX-5 Mk II with AC supply, excellent — $390; Hallicrafters SX-100, fair — $25; Morrow CD Monitor — $5; Johnson Adventurer — $20; Waters compreamp — $10; Heath HO-10 monitor scope — $20, Cash and Carry. A. Hutchins, WA2LHC, 6 Beau Lane, Huntington Station NY 11746.

SBF-34 with calibrator, mike and manual. Mint condition — $240. Box 667, Weaverville CA 96093. (916) 623-5299.

WANTED: Wind generator for Scout Camp. W6BDQ, 12364 Pascaz, Colton CA 92324. Ph. 783-1145.

WANTED: Any condition — Hal RVD-1002 visual display unit, ST-6 terminal unit, HP-608 signal generator. State lowest price and condition. K7VOY, 1414 E. Verlea Dr., Tempe AZ 85282.

WANTED: Very high quality general coverage receiver, R390A, 51J4, SP600. Alan Yudell, W7ETW, 926 East McDowell, Phoenix AZ 85006.

FOR SALE: New SR-C4300, S/N 201008 UHF 5W 12ch FM transceiver (like C826MA) — $360. Wanted: TR-4C or Swan 500C, etc. Mikio Maruya, 20821 Amie Ave, Torrance CA 90503.

SWAN, 250, with 117XC Ps. A-1, $300. Clegg Interceptor B, with Allbander HF Tuner, A-1, $300. Russell, 19680 Mountville Dr., Maple Hts OH. 44137.

WANTED: Collins 312B-4 control box. Also need F455FA-05 mech. filter, 75S-3 cabinet, low-pass filter, and 3KV. Dual-section variable at least 200 pF each section. Sell: Hallicrafters HT-46, 180 watt filter — ssb/cw. Good cndx w/manual — $169; Johnson Matchbox 275 w/swr — $59. Heath IO-10 scope w/377-C probe, EF-2 kit. Flawless. Best offer K3BFA (215) 376-7961.

COMPLETE station, DX60B HG-10B, both like new. NC109 good condition with xtal cal; speaker; Q Multiplier wired in; Johnson TR Switch; swr bridge — $225. WA2SRO, Ralph Yodice, 43 Lorraine Drive, Rhinebeck NY 12572.

CHRISTIAN Ham fellowship is now organized for Christian fellowship and witness among licensed amateurs. Free gospel tract sample and and details on the organization on request. Christian Ham Callbooks, listing members, $2 on donation. Christian Ham Fellowship, 5857 Lakeshore Dr., Holland MI 49423.

WRITE today for special cash quote on new boxed ICOM IC-230 two meter transceiver. Bright Electronics, 6434 Colebridge Rd., NW, Atlanta GA 30328.

NEED MANUAL for Heath Cheyenne transmitter. Lance Lee, 301-7th Ave. East, West Fargo ND 58078.

FOR SALE: Heath HM-102 digital multimeter — $200; Johnson 504 transceiver with base station power supply and crystals for 34/94, 19/79, 07/67, 28/88 — $350; Collins 75S1 receiver with cw filter and Q multiplier and 32S1 transmitter with power supply — $650. W1KLK, 5 Petticoat Lane, Broad Brook CT 06016. (203) 623-2596.

WANT SSB solid state QRP like Justin Mini Com HQ 215, SPR 4, R 599, Argonaut, consider FPM 300 mk II, SBE 34 if price right, also HR 2, GTX 10, Gladding 25. WA5AAO, Box 335, La Grange TX 78945.

FOR SALE: RCA SSB-1. Best offer, or trade for TC-2. WA2LQP, Apt. 844-5G, Governors Island NY 10004.

NOVICES: Allied AX-150 receiver, Drake 2NT transmitter 10 through 80. — $250. WA2FQS, 3 Garden St., Toms River NJ 98753.

WANTED: QST 1915 Dec; 1916 all except Aug. and Oct.; 1917 Jan, Feb, Sept; 1919 June—Dec; 1920 Jan, Feb, March, June, July; 1921 Dec; 1922 Jan. C.J. Mozzoch, W1LYA, Box 1315, Hartford CT 06101. (203) 527-8635.

WANTED: Drake SPR-4 receiver. J. Garber, WBØJCO, 1715 Wilshire Dr., Rochester MN 55901. (507) 288-7867.

CLEGG FM-27 B, barely used — $370. Jay Sewell, W5DWN, 2102 Pecos, San Angelo TX 76901.

FOR SALE: Heathkit SB401 with complete set of crystals, excellent condition — $250; Heathkit SB-303 solid state receiver, excellent condition — $250; Hallicrafters HA-1 electronic keyer, good condition - $35. Neon pilot lamp missing. You pay shipping for above. WB4QPH, C.W. Wandrey, 1549 Findlay St., Deltona FL 32763.

CONSOLE: Heathkit SB-630 station console, $45. Perfect condition. WBØMED, Dan Rosen, RR2, Box 36, Kalona IA 52247. (319) 656-3292.

TR-22 — $95; HR2-A with encoder (tone burst) — $115; both have many crystals. SX-101, good shape — $70. WB5MHA, 429 Stephenson, Shreveport LA 71104.

FOR SALE: General Theory on cassette tapes and booklet. Bought through QST. Passed my General. Asking — $35. Joe Adams, Jr., 3550 Culver Rd., Rochester NY 14622.

FOR SALE: SBE 34 — $295, matching SB2-LA linear — $150, both for — $395, excellent condition. Lowell Vonada, KØMXJ, Lincoln KS 67455.

WANTED: info. How to stop dial pointer slippage. R.M.E. 4350-A, Dunn, 2641 Ellsworth Terr, Macon GA 31201.

SALE Heathkit SB300 Receiver $225, SB400 transmitter $225, SB610 monitor scope $65, SB630 station console $65, SB600 speaker $15, Package, all for $550. All filters and crystals. All like new. R. Meyer, K2PBW, 1625 Pin Oak Rd., Williamstown NJ 08094.

IBM Electric typewriter, model B, Needs cleaning. $95. K3MNJ, 8361 Langdon St., Phila PA 19152.

FOR SALE: CXT-A (Signal One), CW and RTTY optional filters, manual and custom dust cover. Reported to be last one made at Calif. plant. One owner-no time to use —$1295. Will accept as partial trade new R-390A, commercial RTTY and/or SSB Transmitter (SRT-16, TMC, Collins, etc.) or Lugar pistols. Steve Hose WA9AXE, Forest Lake Estates, Hope IN 47246.

SELL: Collins 32S3 SER 101526, 516F2 supply, 75S3B SER 85174 no modifications, round emblems — $1,000. W2UOO, (201) 842-2854.

FOR SALE: Best offer by 15th of month. Used EV 729 Mike, P&H AR1 switch, used tubes — 6 866A and 5 4-400A. WØDCD, St. Louis MO 63123.

FOR SALE: Complete Collins S-line also 312B-4 control also 30L1 amplifier. No trade — instruction books and cables. WA1GRX, (203) 375-2848.

SX28; complete, working. — $100/offer. K6IIO, Box 811, Hawthorne CA 90250.

SB-401 — $225; SB-303 — $275. WA9VTY, 603 Stratford Dr., Washington IL 61571. (309) 283-8056 nites.

SELL: TR-106 6 meter xcvr kit. New, unassembled, best offer R. Leach, 552 Orient Ave., Dubois PA 15801.

FOR SALE: DX-60, HG-10 & NC-155. Used very little (QRT during navy and college) — $190. You pay shipping. WB2BIS, c/o K2EGI, 5 Stratford PL, No. Babylon NY 11703. (516) 669-8281.

COLLINS 75A-2 — $150; clean HT-37 — $135; Heath IG-42 RF Signal Generator — $60 (used twice) like new; RME DB-23 preselector — $10. K1KXA, 4 Roberts Road, Enfield CT 06082.

FOR SALE: Complete Ham Station. Heath Signal Gen M-102; Heath VTVM; Heath Phone Patch; Call-a-dent Clock; Eico keyer; Heath SB-610; T-4X; R-4A; MS-4; Power Supply AC-3; MN-2000; Vibroplex keyer; Swan FM-2X; Heath SB 200; Ham-M Rotor; Tribander Classic 33; Tower; Turner Mike; 14-AVQ ant.; Drake filter; HW-32A; HP-13A pwr supply; 20M Hustler Ant. Harray Zackay (213) 336-6469, after 7 p.m. WB6RJZ, 15935 Maracaibo Pl., Hacienda Hts CA 91745.

SELLING: Icom IC-21 — $300; Swan VHF-150 — $175. Bill Johnson, 1119 Lady Elaine Drive, Vatrice FL 33594.

WANTED: Working SB-640. WA9GBW/4, 5450-B Brett, Fort Knox KY 40121. (502) 624-2301.

WANTED: IEEE Proceedings: April 1973 and September 1973. WB4WZR 8441 SW 142 St., Miami FL 33158.

FREE: 12 Extra crystals of your choice with the purchase of a new Regency HR-2B at — $229. Send cashier's check or money order for same-day shipment. For equally good deals on Collins, Drake, Ten-Tec, Kenwood, Swan, Atlas, Standard, Clegg, Icom, Genave, Tempo, Venus, Alpha, Hy-Gain, CushCraft, Mosley, and Hustler, write to Hoosier Electronics, your ham headquarters in the heart of the Midwest. Become one of our many happy and satisfied customers. Write or call today for our low quote and try our individual, personal service. Hoosier Electronics, R.R. 25, Box 403, Terre Haute, Indiana 47802. (812) 894-2397.

URGENTLY wanted: Pre-war PBY RDF loop DU-1-2-3-4 with amplifier and compass rose. Write W6UCJ, P.O. Box 63, Northridge CA 91324.

MUST Sell: SB-401 w/xtal pack, used 1 hour — $325; HW-32A HP-13 d.c. supply GH-12A HS-24 pkg. — $160; MT-1 xmtr. HP-20 a.c. supply — $60. All excellent condition, K3ASF, 120 Brink Drive, Cambridge Springs PA 16403.

WANTED: Any National HRO-60 coils. R. Haniman, WA2TUC, 4570 FCN, McGuire AFB, NJ 08641.

HEATHKIT HW-16 transceiver and HG 10B VFO. Both for $100. Wayne Phelps, P.O. Box 1654, Klamath Falls OR 97601.

SELL: TR44 Rotor — $30 plus shipping; 24 hr. clock — $5; VM stereo tape recorder, reel to reel — $35 plus shipping; EV664 mike w/stand — $25 plus shipping; Mosely Triband beam MP33 w/40 meter traps — $80 plus shipping. Don, WB9BQV, 4409 Prospect, Downers Grove IL 60515.

SB102, HP23B, SB600, SB200 — $495; Need DX-100, TX-1, Valiant type XMTR. Need HQ180, R388, R390, type rcvr. Need RTTY machine, supply, converter. K3SIO, John Good, RD 1, Box 810, Jersey Shore PA 17740.

WANTED: Mosley MB 15 Mini beam complete or the coil set for the driven element. J.L. Wilson, W6UBG, 55 Templar Place, Oakland CA 94618.

WANTED: for pennyless ham in isolated Greenlandic settlement with electric power only a few hours per day: HF amateur-band transceiver capable of operating on both 220 VAC and 12 VDC, e.g. Kenwood TS-520, Yaseu FT-201 or 101, or similar with either built-in or external power supplies. Send details and offers to OZ8MD/OX3MO/W3 M. Djernes, 153 Oakville Drive, Pittsburgh PA 15220.

FOR SALE: B&W LPA-1 linear with LPS-1 power supply — $200. W1PEX, 5 Fairland St., Lexington MA 02173. (617) 862-9393.

WANTED: HA-5 VFO, also will trade ham gear or pay cash for eight inch or larger Cassegrin telescope. Arden Harmon, 1239 Hoffman St., Hammond IN 46327.

SELL: Heath SB303 & SB401 — $500. I ship. Kibildis, R1 Fountain MI 49410.

WANTED: LF tuner HA10 for SX117 or LF-4 tuner for Drake 4 series K8PUU, Paul Nelson, 400 S. Waverly, Lansing MI 48917. (517) 484-4900.

SELL: Boonton 202E AM-FM Signal generator — $150. Boonton 207E Univerter — $25; covers .1 MHz to 216 MHz. Glen Schmidt, W9AQK, 5123 N. Chester, Chicago IL 60656.

FOR SALE: Mohawk Rcvr — $65. WA5WZX, 826 E. College, Seguin TX 78155.

WANTED: Excellent condition, ASTATIC D-104 mike — W1BB.

SELL: Fanon SFT 600 base/mobile 10 mtr/CB xcvr, original carton, mint condition, factory guarantee. Includes xtals, mic, built in ac/dc. — $75 or best offer. Certified Check or MO only. WB2FIG, 5221 Avenue 'I', Brooklyn NY 11234.

COMCRAFT CTR-144, two meter fm and am; both crystal and VFO; QST May 1972, page 52; mint — $360. Bob Via, WB5FDT, 6827 Spring Hurst, San Antonio TX 78249.

DRAKE R4A — $260. W. Pfaff, K2GNC, Moriches NY 11955. (516) 878-0080.

SELL or trade. Drake TR4C, AC-4 MS-4, new, won at hamfest, need a good linear or what have you of equal value. E. DeCobert, 609 Henrietta St., Gillespie IL 62033.

HEATHKIT SB-110A transceiver, SB-600 speaker, HP-23B ac supply Mint condition — $325. 6-meter 1KW amplifier — $150. WB9AIA, William Novak, 2483 North Bartlett Avenue, Milwaukee WI 53211. (414) 962-7162.

2-METER FM- Standard 826MA. Mint cond. with 24 crystals and matching power supply. K2SCK, Bob Richfield, 111 Sierra Vista Lane, Valley Cottage NY 10989. (914) 358-7182. — $315 firm.

NEEDED: HA-5 VFO (working or repairable) to complete Hallicrafters Novice rig. All letters answered. WN4JEO, Jay Blunt, 2319 Knollwood Place, Tampa FL 33604.

QST, Handbooks 335 copies, 1933 to 1973. Listing from Al Wessel, W2AAZ, 5819 Fieldston Road, Riverdale NY 10471.

DRAKE: 2C, 2CQ, 2AC — $259. Clean and better than new. Gonset 1V-6M — $99. Hank, WA2OVG, (212) 889-4303, 796-8617. 2530 Independ. Av., NY NY 10463.

TRIEX T237, crankup tower, Swan beam, AR22 rotor, all like new $275. Will accept a trap vertical as partial payment. WA6MOW, Tel (714) 830-9821.

HAMMARLUND HQ-170AC-VHF receiver, 160M to 2M, clock and IF noise immunizer installed — $275. WA3OBW (215) HO2-9293, Ralph Conner, 149 Gladstone St., Phila. PA 19148.

COLLINS 75A-4 No. 1140 — $330. Trade for FL2100B, FV 101B or Triband beam. Make offer. D. Voit, 709 Maple, Dimmitt TX 79027.

CONTROL Panels — Fabricated and Gorton engraved, for antique radios and custom equipment. Parsons, 22 Forest St., Branford CT 06405.

CALL Letter License Plates wanted for WAS-WAVE and DXCC-type collection. Postage promptly returned. Larry Vogt, K4UEO, 8213 Springfield Village Dr., Springfield VA 22152.

488 Copies QST nearly solid Oct. 37 to July 74, some early as 1928. Other old magazines, handbooks, catalogs, texts, etc. SASE for list. Henry Shaw, 508 Alexander Ave., Cape May Point NJ 08212.

DRAKE TR-4C transceiver and matching AC-4 power supply, — $500. WA3INC, 1030 Locust Street, Columbia PA 17512. (717) 684-7379.

SERVICE manuals, most Hammarlund equipment since 1930 — $6.50 each post paid. Will align your Hammarlund receiver to original specifications. Also service Hammarlund/Outercom and Aerotron two way equipment. 15 years factory experience. Wayne Cordell, K4HCS. Blue Ridge Communications, Rt. 4, Weaverville NC 28787. (704) 645-7070.

DX 60 B — $55; HR 10 — $30; HW 30 & Mble. PS — $30; 2MTR. Gnd plane ant. — $5; Halo ant — $5; Xtals — $1; SBE 34 — $150; 4X150A, 4X150G — $15 ea. Want manual for AM1178 "D Band", WA3PHL, 7 Circle Rd., Millersville PA 17551 (717) 872-4745.

OLD radio tubes wanted, from years 1920 through 1930, in used or new condition. W4PRE, G. Jensen, 6447 Overlook Dr., Alexandria VA 22312.

FOR SALE: CX7 Nixie unit with plug in ICs. Perfect condition. Save $30 and buy this for — $120. W3VDA, Box 1333, Harrisburg PA 17105.

HW-101, w/slight mod., HP-23A, SB-600, Turner 454-C mic. — $300 or write for deal. WA6BTE, Bowles Hall, Room 506, Berkeley CA 94720.

WANTED: Cheap Hammarlund HK-1B keyer for cannibalization. Ray, WA2TEI (212) 961-1290. 61-15 185th Street, Flushing NY 11365.

GTE 12 button touch tone pads — new, original carton — $15 ppd; Swan 250-C — $325; TV-2C — $225; 230-XC — $95; VX-2 — $25; 14C adapter — $50; 12VDC mobile supply — $100. All New. W3TMZ, Colson, Route 3, Mt. Airy MD 21771. (301) 253-4376.

COLLINS 75S3 mint — $450; 351D2 mobile mount, new — $60; 136B-2, noise blanker — $75; Heath SB200, mint, yr. old — $200; Omega-T ant. noise bridge, 1-300 MHz — $25. (209) 733-3215, Dick Shideler, 3731 Evergreen, Visalia CA 93277.

SELL: Motorola 2 meter 1-KW amp. Also, 2 meter mobile 100 watt Dycomm amp. Also, Eimac 4-400 tubes, 5V 30 amp trans. W9BPG, 609 Henrietta St., Gillespie IL 62033.

DRAKE 2C, 2CQ Q-Multiplier & 2AC Calibrator — $230; Globe HG-303 XMTR — $65. Call Ron (516) 678-6689.

SELL: SR400 transceiver PWR supply outboard VFO HA20 peak condition — $600 312-272-2443, W9IY, 2285 Holly Ct., Northbrook IL 60062.

SWAP/SELL: Good NCX-500, mike, manual, HB/AC. Reasonable. WB4BXJ, 310 Noel Road, Orange Park FL 32073.

REALISTIC DX150A receiver, four band .535 to 30 MHz — $75. W3DJD, 205 Elliger, Fort Washington PA 19034.

SELL: SX111 — $90; Viking II and VFO — $70; Both — $150. QST 56-72, CQ 61-72, Local Pickup. K4ASJ, Wash DC area. 780-3762.

WANTED: Top quality general coverage receiver. K9DRK, 9733 Oak Lane, Des Plaines IL 60016.

HALLICRAFTERS SX101A, final production model, excellent condition — $150; Lance Johnson, K1MET, 28 Heatherstone Drive, East Longmeadow, MA 01028. 525-2965.

FOR SALE: Heath DX-60B — HR-10B with calibrator HG-10B VFO — package deal only — $150. WB5HQN, 109 Hollywood Drive, Edinburg TX 78539.

DRAKE TR-4, w/nb, RV-4, AC-4, & spkr. — $500. W1CHA; P.O. box 497, Salem NH 03079.

WANTED: Collins F-455FA-05 mechanical filter. For Sale: 1974 Heath-aligned HG-10B VFO — $39 (shipping included). Imboden, WB9OQH, 2650 N. St. Louis Ave., Chicago, IL 60647.

DISCOUNT prices plus full warranty. Call for fast quote and delivery. All items new, guaranteed. Midland 13505 30W/2MFM-Write; CDE Ham-2 109.00; CD44 79.95; Belden 8448 rotor cable 12c/Ft; Belden, consolidated RG8FOAM coax No. 8214 18c/FT; 15% discount triex, W, MW, super mast-FOB Calif; Sprague 500pF/20KV doorknob 1.95; Raytheon 811A 15.00/Pr. 7.95 ea; Sorensen ACR2000VA AC regulator 150.00; Quote Kenwood TS520, Swan 300B, Atlas 180; Cahrad KW-SWR dualmeter bridge 24.95; RG62B/U 8c/Ft; RG71/U 8c/Ft.; new panel meters, old tubes (1V, 7V, etc)-Write. Prices FOB Houston. Madison Electronics, 1508 McKinney, Houston TX 77002. (713) 224-2668. Nite (713) 497-5683.

ANDREW H J 5-50 7/8" diameter 50 ohm coax. Low loss and high power to 5 GHZ. Approximately 1000 feet in 150 foot lengths with or without type N connectors. $1.00 per foot for the entire lot. FSJ 4-50 1/2" super flex, medium power to 10 GHZ. 40 foot lengths with type N connectors. Mil. 4X150A. Make offer. John B. Carson (Ex. K6INU) Route 1, Box 502A, Arroyo Grande Calif. 93420 (805) 489-3295.

COLLINS 32S1 and 516F2 supply — $350; 75S1 — $225; Gonset GSB201 linear — $175. Excellent condition. W6DO, (213) 670-8601.

SALE: Heath IT-12 signal tracer — $24; CO-1015 ignition scope — $125; IG-52 TV alignment generator — $50; Regency HR-2A with four sets xtals — $165 All top condition, will ship. K1ZLL, 24 Rayton Road, Hanover NH 03755.

WANTED: B & W model 515B-B SSB Generator, B & W 370 SSB receiving adapter IF 450KC, CRT 3ADP1, T.O. 12R2-2ART13-2, TM11-6625-274-12. Violette, Rt 6 Box 794, Marshall TX 75760.

TRADE R390 for 75S-3 clean, case, manual, and spare I.F. included. WB4NHB, 2702 S. Fairway Dr., Melbourne FL 32901.

SELL: Johnson KW Matchbox — $100; HT41 linear — $150; DF32 — $125; HQ170 — $150; Collins 74A4, serial 1017, 2 filters — $325; KWM-1, 516F-1, needs VOX work — $275. FOB QTH. W2KQA, 127 Nesbit Terrace, Irvington NJ 07111.

NCX-3, NCXD — $215; Viking Valiant — $100; HQ-110A (mint) — $125, Wanted: TA33Sr. WA2TUA, A. Watson, Rt. 5, Box 383, Jamestown NY 14701. (716) 664-7676.

FOR SALE: Collins KWS-1 transmitter. Complete,Perfect condition. Price $695. Wm. H. Chapman, M.D., 1111 Parker Place, Charlottesville VA 22901.

FOR SALE: Robot 70 Monitor, Viewing hood, Robot 80 camera, marco lens, latest mods — reversal 1/2, 1/4, frames — $525. W9LS, Myron C. Pogue, 3770 22nd St., Boulder CO 80302. Phone (303) 449-2500.

DRAKE 2-A, receiver, mint condition — $115. Joseph Calder, K3EAN, 6351 Oakland St., Phila PA 19149.

WANTED: Working two meter FM rig. Have working gear to trade. WA3SWP, 142 Crescent Hills Rd., Pittsburgh PA 15235.

SALE: Heathkit SB303 all filters and SB401 — $400; SB200 — $175; SB650 — $90; HD10 keyer — $20; HW7 with AC power supply — $50; HM102 wattmeter and SWR bridge — $15; All units with manuals in first class operating condition and used less than 50 hours. Also SB634 — $175 with manual. W4VMM P.O. Box 352, Ormond Beach FL 32074.

FT-101, cw filter, FV-101 remote VFO, mic, all perfect. — $575 ppd. K8PBZ, 1282 McCoy Rd., Columbus OH 43220.

WANTED: Eico 722 VFO in good condition, with manual. Also, HR060 and 50 coil sets. K9UKX 51625 Chestnut Road, Granger IN 46530.

FOR SALE: Heathkit 6-meter station, HA-20, HX-30, B&W model 370, D10-4 mike, antenna, and more. All manuals, too. — $325. Jean A. McKnight, WN2TXV, 3086 Diamond Dr., Vineland NJ 08360.

WANTED: Mobile rig. Must be mint ahd have P/S. Green, Box 286, Linn MO 65051.

CRYSTALS airmailed: General purpose, MARS — Novice, active, FT-243, all frequencies, minimum five, 40M, 15M, 10M — 99c each, 80M $1.75. Cover bands inexpensively, rock solid — less than five 80M $1.90, other $1.50. Novice, eight crystal four band, edge calibrator and QSO package (also good with VFO) — $9.95. General purpose: FT-243 .01% — 32 pF, 3500 - 8600 Kilocycles $1.90, (five $1.75 ea.) (nets, ten same $1.45), 8601 - 15000 fundamentals, 10000 - 30000 overtones — $2.95, 160M, four $9.80, single $2.95. Add 75c for HC6/u above 2000. Add 50c each for .005%. Airmail 20c/crystal, 1st-cl 15c. Free listings. Bob Woods - W9LPS, "Crystals since 1933", C-W Crystals, Marshfield Missouri, 65706.

HAMMARLUND 110 A with speaker, good condition. Rankin, Box 32, Elsah IL 62028.

FOR SALE: 1975 Callbooks: USA — $10,95, Foreign — $9,95, Both, $19,95, prepaid. Ship Dec. 74. Craig Radio, Box 615, Portsmouth NH 03801.

NOVICE station, DX60B HG 10B, Allied AX190 — $250. Leon Williams, 128 Comer Terrace, Macon GA 31204. 742-1858.

FOR SALE: KLM log periodic tri bander, no traps 13 to 30 MHz 7 EL — still packaged. Make offer. W6MDQ, 4492 W. 137th St., Hawthorne CA 90250.

SELL: As a unit only, complete clean Heathkit station, SB-101 with 400 cycle c.w. filter, HP23-B power supply, SB-600 speaker, SB-640 remote master oscillator, SB-200 KW linear. All with manuals. Works perfectly on all bands. Prefer pick up. Price firm — $700. Al Palmer, W1KIO, 111 Wilfred St., West Hartford CT 06110. Phone (203) 523-9268.

WANTED: Mosley MPK3; sell T4FRC 810 finals. WB2USA, 2086 Mapleview Court, Westfield NJ 07090.

WANTED: VLF receiver tuning approximately 15 kHz to 150 kHz. Chicagoland area only. James Rubens, 5 East Van Buren St., Joliet, IL 60431.

GREBE, wanted regenerative Grebe receiver, W9IMS/3, 329 Evergreen, North Wales PA 19454.

KEYER, Heathkit HD10. Excellent condition, with manual. — $20 plus postage. WA4FOK, 108 Creek Dr., Florence SC 29501.

WANTED: All kinds of antenna insulators and Radio lightning arresters for my personal collection. Please describe and price. All replies answered. Walter Lehnert, 5209 Minnehaha Blvd., Edina MN 55424.

WANTED: Heath SB-10 ssb adapter, clean, with manual. K7VGW, Box 405, Challis ID 83226.

HEATH HR-20 rcvr, HX-20 xmtr, HP23 ac ps, MP-14 inverter, accessories — $200. Ike Lee, c/o WDAE, 101 N. Tampa St., Tampa FL 336-1. (813) 229-0404.

HALLICRAFTERS HT-37, excellent condition, very little use. Recently re-aligned, new finals — $189. 31 Harvard Court, White Plains NY 10605. (914) 949-9146.

SCRAMS, 07/67 of New London Conn., wishes all its members & users a Happy Holiday Season. Any Amateur planning to travel to the Southeastern Conn. area who desires a list of the local hams on 2 m fm, send s.a.s.e. to SCRAMS, P.O. Box 3, Borough Station, Groton CT 06340.

WANTED: Clegg Interceptor B receiver and matching Allbander converter. Also Johnson Matchbox. Prefer rigs located in New York City area. Contact G. Hawrysko, WB2GWU, P.O. Box 568, Boro Hall Station, Jamaica NY 11424.

SIGNAL-ONE CX7 Serial No. 244 for sale — $1,000. Also DB23 Preselector — $20. New 4D32 — $25. W9WYN. (312) 485-5990.

SELL: HRO50T-1 with speaker, coils and manual — $140; HA-1 keyer — $35. Prefer pickup. W8AC, 1570 Quinby Rd, Circleville OH 43113. (614) 474-8910.

QST 12/38, 3/40, 1955 thru 1957 (12/56 missing); Radio 2/42, Radio Handbook 1939. Make offer for all. W2BUW, 6 Beechwood Drive, Latham NY 12110.

COLLINS 62-S-1 transceiver Wanted. — $725 reward for one in mint electrical and mechanical condition. Bob Ewing, WA4GWG, Apt. 7-C, 2160 Hillsinger Rd., Augusta GA 30904.

SELL: Collins 75A4, Heath SB610, SB220 fan, Drake MS4, Savoy 15-80 dipole, bug, Bolex H16 Rev5 Vario Swiftar. Reply with detailed information to all. WA6KAC, 240 Graves St., San Luis Obispo CA 93401.

DISCOUNTS on all Astatic, Electro-Voice, and Shure microphones. Astatic D-104 w/UG8 PTT stand: $30.87. EV 619; $31.22, and Shure 444; $25.87. Shure 444T; $28.94. All units new, guaranteed. Shipped ppd. w/check or C.O.D. Other models available. Advance Sound Company, 781 Deer Park Road, Dix Hills NY 11746.

WANT: Rohn 25 or 45 sections; Collins MP-1, 136B-2, 516F-2; Rotator; Regency HR-2B; WA5RGX, Box 254, Southaven MS 38671. 393-0858.

WANTED: Novice equipment, Heath or similar, DX-60B, VFO, GDO, SWR Bridge, Xtals, and bug. Bruce Johnson, 1413 Wellesley N.E., Albequerque NM 87106.

COLLINS 75A2 receiver in good condition — $150. Philip Schwebler, W9GCG, 4536 N50 St., Milwaukee WI 53218.

WANTED: Collins Mechanical Filters F455J21 and F455J05. Sell/Trade: Collins KWM-1 transceiver with 516F1 a/c supply. W3PQK, 615 Market Street, South Williamsport PA 17707.

TRANSMITTING tubes 4CX-1000A w/socket and chimney — $60; pair 4CX-250F — $5 ea.; pair 4X150A — $4 ea.; SK-606 chimneys — 50c ea. Bob K9KCU, 2206 N. 53rd St., Milw. WI 53208. (414) 442-5106.

MOTOROLA B93AKB base, 250 watts output, now 153 MHz. Complete, operating, with instruction manual — $175. K2GTY (914) 337-3523.

6-METER transceiver, Swan 250 and 117XC power supply with crystal calibrator and manual, mint condition — $295. Dick, K9IFF, 2206 N. 53rd St., Milw. WI 53208. (414) 442-5106.

CALL Letter license plates wanted for collection. Will pay postage. Art Phillips WA7NXL, 3401 N. Columbus, Apt. 5-0, Tucson AZ 85712.

JOHNSON SSB adaptor w/ac — $185; Hammarlund HC1 slicer — $60; Swan 250 6M w/ac — $260; Galaxy GT550 w/ac console — $450; Hallicrafter SR150 w/PS150 — $295; Collins 516F2 — $125; MP1 — $75; Collins 51S1 — like new — $475. W2FNT, 18 Hillcrest Terr, Linden NJ 07036. Phone (201) 486-6917.

SELL: FT101, classic Tri bander, Swan 250C, 6 mtr. beam, 2 meter beam, 50 ft. crankup tower, Ham M rotator. No shipping. E. Miller, 1449 Bklyn Blvd, Bayshore NY 11706.

HAMMARLUND HQ-110A with clock — $145; Heath HR-10B with calibrator — $55, both excellent condition, you ship. WA1SCI, David Sanford, 31 Forest St., Middleboro MA 02346.

HELP WANTED: Volunteers or donation of equipment in KC area to start ARC at Christian Neighborhood Center. Help us in this type of ministry. Thanks, Bethel Neighborhood Center, 14 So. 7th, K.C., KS 66101.

GE Porta-Mobil, 8W, 153 MHz, all solid state, Ni-Cad PS & charger, carrying case, manual — $175 or trade for HT. K3GHF, 718 Pineview Lane, North Wales PA 19454.

WANTED: Books — Laport's "Radio Antenna Engineering"; Esen's "Wireless Direction Finding"; Peake's "High Voltage Engineering"; ARRL Handbooks, second, fifth, eighth editions. Nagle, 12330 Lawyers, Herndon VA 22070.

SELL: HQ-170AC-spkr — $170; Valiant — $150; Gonset IIB Mike & xtals, 2 mtrs — $75; Ameco TX-86&VFO — $60; Vibro. Org. Bug — $15; 14AVQ vert — $25; Joystick 10-80M indoor vert & ant. tuner — $25. WA2GMG, 9 Hereford LN, New City NY 10956.

ALUM tower, 40 ft. 3 section crank-up, self supporting, TA-33 plus TA-40KR beam, TR-44 rotor, tilt-over fixture, balun, $415. You pick up. Rob, WA2LFN, 111 Patricia Lane, N. Syracuse NY 13212 (315) 458-2583.

HAPPY Christmas Holidays and Lucky New Year 1975 wishes to all slovenian radio amateurs throughout the world. W8FAZ, Joseph Zelle, 1227 Addison Road, Cleveland OH 44103. QSL SARU.

HW-101, AC, speaker — $265; GSB-100, needs minor work — $100; HQ-170-C — $160; Ranger II, — $120; Globe Scout, VFO — $75. More. Jim, 24 Phillips St., Providence, R.I. 02905. (401) 751-0677.

HEATH HW-16 — $80; HG-10B VFO — $40. Paul Gruettner, WB9ODQ, 2743 So. 52 Pl., Milwaukee WI 53219.

HW-7, AC — $65; DX-150A — $75; WA6YMX, 9392 El Blanco, Fountain Valley CA 92708.

FOR SALE: Henry 2K4 Final Amplifier, very clean, includes spare 3-500Z (new) — $650. Will deliver in the S.F. Bay area. W6CP, C. M. Barrick, 5177 Oak Meadow Dr., Santa Rosa CA 95401.

BAY Area Repairs, Signal/One, etc. K5AM/6, Berkeley, (415) 548-1889.

COLLINS 75S3C with crystals for SW bands used under 10 hours — $695; R390, flawless condition — $395. Details for purchasing U.S. Government surplus $2 per copy. H.L. Collins, Jr., Box 198, Tiburon CA 94920. (415) 435-9084.

TV ANTENNA (slotted array, Patent 3577196 with trademark Sky-Slot). VHF6UHF/FM/Ham 2-meters Rcv/Xmit; no installation or splitter needed (300 ohm line furnished) just unroll and hang on wall; 18" x 48" size. Long side hangs vertically having hand-made acrylic design. Choose either Landscape/Galaxy/Hanging-Branch, or plain plastic (that you can use outside your RV since it works against metal; or "gunk" to chimney for excellent outside antenna). Select artistic design and order postpaid airmail for $15 cash or COD from: Antenna Design Co., 11621 Hughes NE; Albuquerque NM 87712.

COLLINS: 300 Hz crystal filter, adaptable for 75A3, 75A4, 75S3B. New England Electronics Engineering, Box 145, Wethersfield CT 06109.

NOVICES: Need help for General ticket? Complete recorded audio-visual theory instruction. Easy, no electronic background necessary. Write for free information. Amateur License, PO Box 6015, Norfolk VA 23508.

WANT: Good, clean Collins KW-1 or Hallicrafters HT-4 thats priced right. Sam Thompson, W6HDU, 1133 Polk Street, San Francisco CA 94109.

SELL: U.S. Army Signal Corps G.S.T.1 Code Training Set with ten J37 keys. Portable, works on 6 power sources. Unused — $150; Signal Corps Morse Code Flashing Signal Lamp — Unused $25. Both items rare and unique WWII communications gear. Write for more information. Hallicrafter SX130 Receiver, excellent condition — $150. Ben Fisher, 235 Adams Street, Brooklyn NY 11201.

SELL: Unused Standard SRC-146A hand-held with Drake 10 watt amp, xtals — $215. J. Zatowski, 133 N. Main St., S. Hadley MA 01075.

MOBILE ops. Please send SASE for info on shielded ignition systems. Summit Enterprises, 20 Elder Street, Yarmouthport MA 02675.

"HOSS Trader Ed" January Sale. We refuse to be undersold: Remember, if you don't buy it from the Hoss, you paid too much. Demo Atlas 180 Solid State Transceiver — $419; Demo TR-4C — $488; New display Swan 700-CX — $489; Demo T4-XC — $469; FM-27-B Clegg — $349; New Rohn 50 ft. foldover tower, prepaid — $339.95; New Hy-Gain TH3-MK3 beam and demo Ham-11 Rotor — $259. After Christmas Specials. Used equipment: Drake TR-4 — $379; R4-C — $448; T4-XC — $479; 700-CX — $475; Demo L4-B — $639. Some left, Collins at old prices; Swan 350 — $239; Swan 500 — $299; factory reconditioned Galaxy 550-A — $329. Moory Electronics Company, P.O. Box 506, Dewitt, Arkansas 72402. Tel: 501-946-2820.

SIDESWIPER Fans: Beautiful Scandinavian-styled, hand-made sideswiper, teak base, only $11 postpaid. Kungsimport Box 257, Kungsbacka Sweden.

SEND SASE for list of 1915-1920 copies of The Wireless Age and 1919-1922 copies of Radio News. Best offer will take one or all. R.L. Baldwin, 26 Ridge Rd., Simsbury CT 06070.

NEW tubes: 4-400A — $35; 4-250A — $30; Pair 4-125A's — $50; four 572B's — $60; mint SB-620 — $125; Heath HD-19 phone patch — $10; clean SB-34, SB mike, 25-kHz calibrator, SB mobilt mtg. kit, Hy-Gain Ham-Cat with tip rods for 75, 40, 20 and 15 — all $300. New parts for 2400V 1 1/2-amp power supply — $50; NPW dial — $15. W5DML, Box 158, Gonzales TX 78629.

QST's from 1922, $10 for 1920's and 1930's per year. $8 — 1940's, $5 — 1950's. R. Stealey, WA2NCP, Box 313, Chester NJ 07930.

SELL-Trade. RCA 3 inch scope kit, new — $65; RCA VOM WV-38A, new — $50; EICO 680 transistor and circuit tester, new — $55; RCA solid state VTVM WV-50B — $80; RCA microwave transmitter and receiver, new — make offer. Bob Ehramjian, WZ6XD, 1381 Richmond Court, East Meadow NY 11554.

1970 GALAXY V MK III w/ac-400, includes PTT mike, Johnson low pass, SWR bridge and cw bug. All mint condition — $300. Lt Faraone, 5222B Iroquois Ave., Ewa Beach HI 96706.

WANTED: Electronic Instructor, General Theory, workshops. Summer science camp. Write: Eppstein 4B, 440 Westend Ave., New York NY 10024.

COUNSELOR: Ham Radio, Electronics, Rocketry, Etc. Children's camp, Penna. 633 Barnard Av., Woodmere NY (516) 295-5544.

COUNSELOR: Penna. Brother-Sister camp seeks Ham Radio college man with a General license. David Blumstein, 1410 East 24 St., Brooklyn NY 11210.

COUNSELOR: Operator with General license to teach ham radio at Pennsylvania co-ed camp. Have completely equipped ham station. Write Trail's End Camp, 215 Adams Street, Brooklyn NY 11201.

Jobs for Hams

TECHNICIAN wanted, R&D prototype, familiarity with transistor, FET, TTL circuits required, some optics experience helpful. N.J. area preferred. ATTN: Princeton Applied Research, P.O. Box 2565, Princeton NJ 08540. (609) 452-211.

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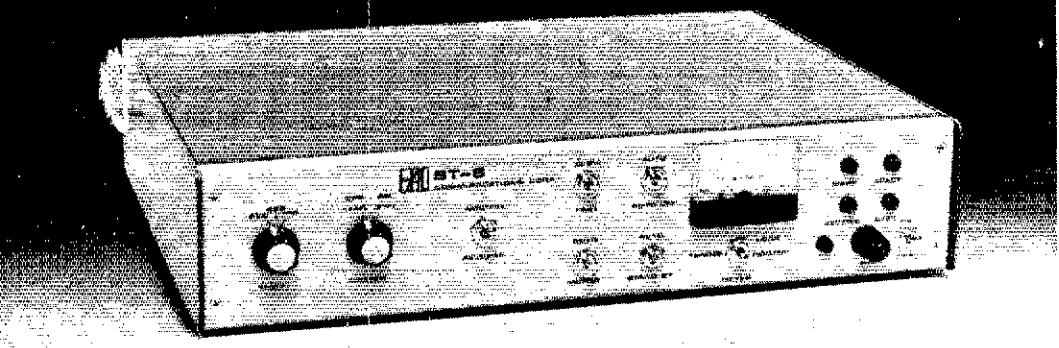

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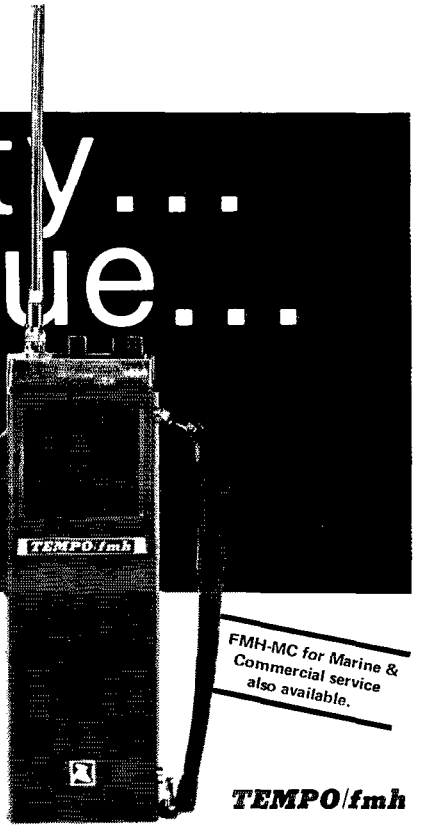

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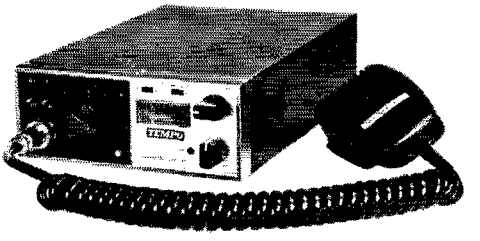

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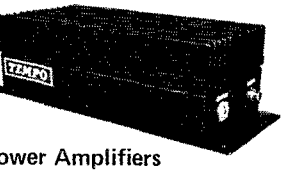

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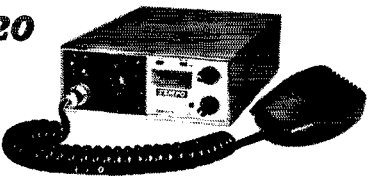

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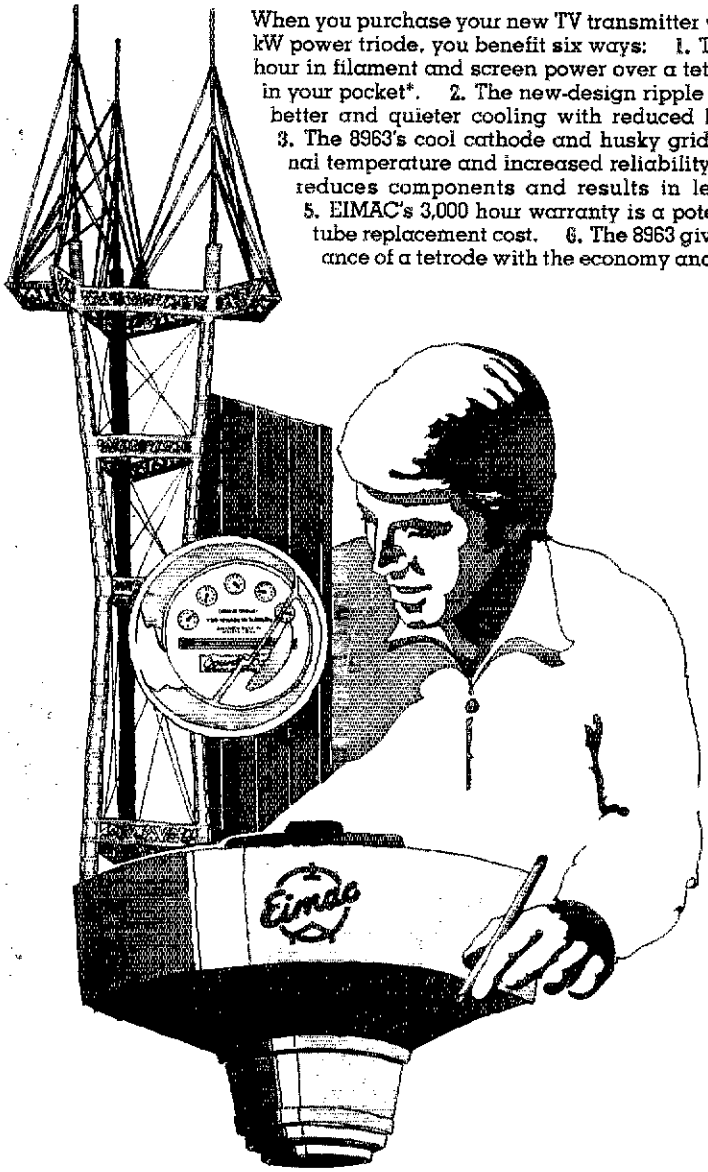
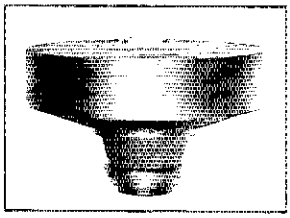


When you purchase your new TV transmitter with EIMAC's 8963 the new 25 kW power triode, you benefit six ways: 1. The 8963 saves 1200 watts per hour in filament and screen power over a tetrode. That's over $250 a year in your pocket*. 2. The new-design ripple fin radiator of the 8963 gives better and quieter cooling with reduced blower power requirements. 3. The 8963's cool cathode and husky grid structure mean lower internal temperature and increased reliability. 4. Simple triode circuitry reduces components and results in less downtime and failures. 5. EIMAC's 3,000 hour warranty is a potential savings on tomorrow's tube replacement cost. 6. The 8963 gives you the gain and performance of a tetrode with the economy and circuit stability of a triode.



Put dollars in your pocket and enjoy improved transmitter reliability with the EIMAC 8963. For complete details, ask your TV equipment distributor or write EIMAC, Division of Varian, 301 Industrial Way, San Carlos, California 94070. Or contact any of the more than 30 Varian/EIMAC Electron Device Group Sales Offices throughout the world.

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*Based on an 18 hour transmitting day at 3¢ per kWH—and rates are going up (Business Week, Oct. 5, 1974).