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WASHINGTON ★ OREGON ★ IDAHO ★ MONTANA

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COY ADDRESSES PORTLAND ON T-V FREEZE

Chairman Explains Commission's Stand on Portland Television

F. C. C. Chairman, Wayne Coy, addressed the Portland Television Now Committee and Portland's City club on May 19th to explain the Commission's stand in the T-V freeze and reasons for being unable to grant Portland early release.

Mr. Coy explained that lack of knowledge about the coverage of present VHF television frequencies has given the F. C. C. one of its big headaches. He recalled that prior to the end of the war there were just a few TV stations in operation. From these few had to be derived enough information to "assume" propagation and interference problems. One of these has been the insufficient separation between adjacent channel and co-channel stations. From earlier data received it seemed safe to assume a separation of 150 miles for co-channel and 75 miles for adjacent channel TV stations was sufficient to prevent interference. Now that there are enough stations on the air to test this decision it is found that co-channel separation should be 220 miles and adjacent channel 110 miles. To have made a "longer separation" decision earlier would have brought rebuttals on the basis it would decrease the number of stations allowed in heavily populated areas.

Coy's guess at the expected future developments in the TV freeze run along these lines. The color TV hearings should end about May 25th. Following this will be a twenty day period to file briefs regarding color and then another ten days will be

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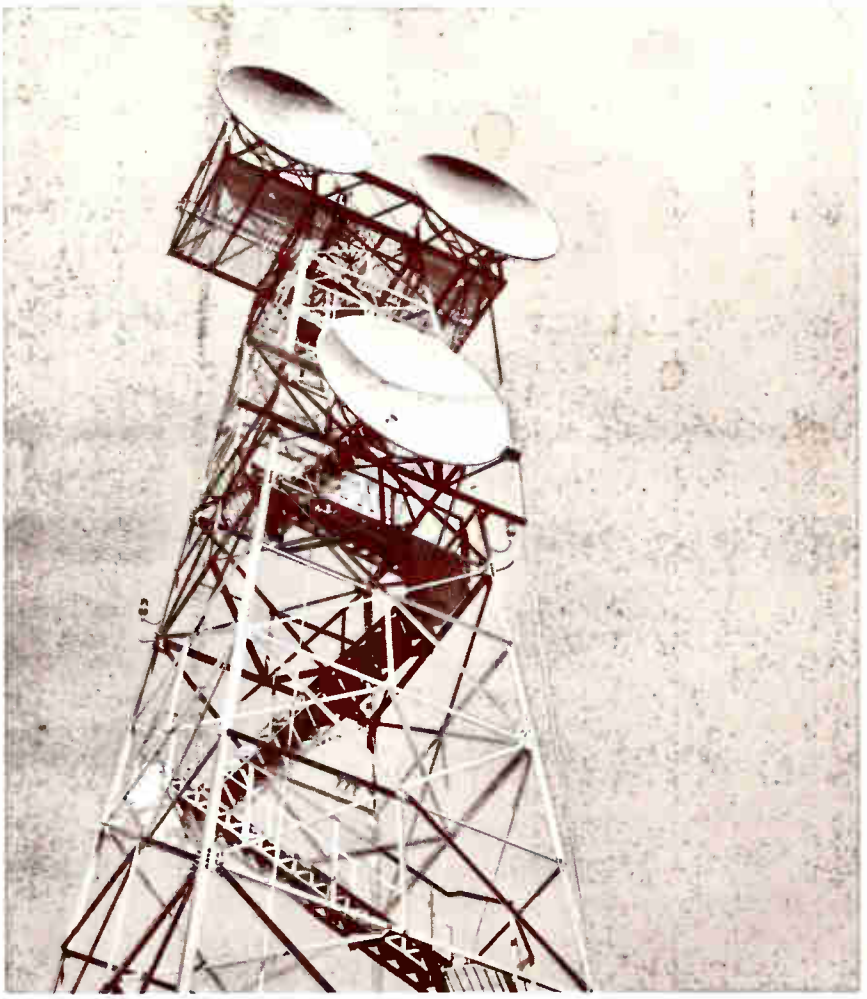


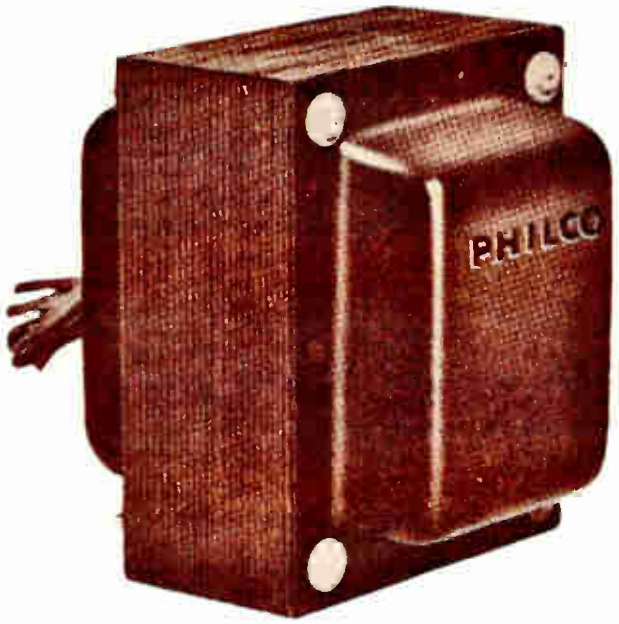
A view of the Bonneville Power Administration's Snohomish substation microwave tower. Only the upper half is shown here. See story on page three.

IDAHO APPLIES FOR AM STATION

Snake River Radio and Television Company, Rexburg, Idaho, applied (May 16th) for a 250 watt unlimited AM station with frequency 1230 kc. Estimated construction cost would be about $47,500.

PHOENIX TV SIGNALS REACH PORTLAND

The TV test pattern of KPHO-TV, Phoenix, Arizona, was picked up at Roy's Radio, Aloha, Oregon (near Portland) last month. The pattern which appeared around 10:00 A. M. was held perfectly for ten minutes.



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45-7011-1...	325-0-325	40	5V-2A	6.3V CT - 2A	2 x 2½	2½	3	2 3/16	2¼	5.15
45-7011-2...	350-0-350	70	5V-2A	6.3V CT - 2.5A	2¼ x 2 3/16	2 3/16	3⅜	3⅜	3¾	6.25
45-7011-3...	350-0-350	90	5V-3A	6.3V CT - 3.5A	2¼ x 2 3/16	2 3/16	3⅜	4	4½	6.75
45-7011-4...	350-0-350	120	5V-3A	6.3V CT - 4.7A	2½ x 3⅛	3⅛	3¾	4 1/16	5½	7.65
45-7011-5...	375-0-375	150	5V-3A	6.3V CT - 4 7A	2¾ x 3 1/16	3 1/16	4⅛	3 15/16	6	9.05
45-7011-6...	400-0-400	200	5V-3A	6.3V CT - 5A	3 x 3¾	3¾	4½	4 1/16	9	12.00

Radio Television & Appliance, Inc.

500 WESTLAKE AVE. NO. SEATTLE 9, WASHINGTON **MAin 0787**

Bonneville Planning Extensive Microwave Relay System

Microwave radio will soon be providing the Bonneville Power Administration with the necessary means of insuring dependable multiple-channel communication with its many substations and dispatch points throughout the northwest.

The B. P. A. has been rapidly growing in size until it is now providing service to widely separated points in Washington, Oregon, Idaho and Montana. During the Administration's rapid growth the communications system necessary to coordinate such an extensive service had been seriously crippled due to such conditions as lack of material, money and manpower. It is just within the past few years that a good sound communication network plan was authorized.

The Bonneville network plan had to include maximum efficiency of operation at the lowest expense. The manner of point-to-point communication included consideration of microwave relay methods versus the conventional power line carrier. The facts brought forth (showing the varying requirements of different branches and links of the network and comparative installation and maintenance costs of both systems) led to a combination of microwave relay and power line carrier. The cost comparison facts and figures were based upon B. P. A.'s system, requiring numerous channel dropouts at relatively short distances. The cost of a one or two channel power line circuit proved less than the microwave relay requirements cost. Where three channels of speech or other intelligence are involved the cost of each system of communication was comparable. Where four channels were required the cost of power line carrier was equivalent to the cost of a complete microwave installation with complete duplication (spares) of all r. f. equipment. A six channel power line installation would cost twice that of microwave relay.

With this data available, the B. P. A. authorities saw the practicability of immediately granting the installation of two hundred miles of microwave along their presently existing communications paths. The balance of network installations would then be installed as power line carrier unless future plans revealed heavier usage than anticipated. The two systems would be linked together with the low-usage power line circuits branching off from the microwave relay stations. One of the typical branch circuits is a power line carrier starting at the last microwave relay station near Spokane, and extending through Idaho and into Mon-

(Continued on Page 8.)

The Northwest Electronic World

By mail on the 1st of every month to over 5,000 technicians, engineers and service shops in Washington, Oregon, Idaho and Montana. This is complete coverage.

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I. R. E. ACTIVITY

The Seattle section of I. R. E. welcomed Dr. Ralph Brown, director of the Bell Telephone research laboratory, as guest speaker at their May 18th meeting. Mr. Brown's paper, "Modern transmission methods in electronic communication," ended with a demonstration of pulse code modulation using different numbers of codes and showing increased fidelity with an increase in the number of code characters.

The June 15th meeting of the Seattle section of the I. R. E. will be held at 8:00 P. M. in Room 140, Bagley Hall, University of Washington.

Wallace J. Reed, engineering antenna group of Boeing's Physical Research Laboratory, will present his paper, "An analysis of several propagation surveys in the V. H. F. region for industrial radio communication." This paper represents Mr. Reed's thesis for his master's degree at Oregon State College.

The three frequencies selected are comparable to the industrial radio communication frequencies in present use and cover flat, rolling and rough terrain characteristics. Equations will be stated for propagation over flat terrain and information for approximating conditions over rolling and rough terrain will be presented. The three frequencies used are in the 10, 6 and 2 meter bands.

MASTER RADIO SERVICEMEN

The Master Radio Servicemen's Association, of Seattle, have set an approximate meeting date of the second Thursday in June. The earlier scheduling was changed due to the plans of many members to attend the "Town Meeting of Radio Technicians" activities June 5th, 6th and 7th.

It was announced that two of the organization's members, Clarence Ramsey and Don Nelson, are scheduled to present papers at the Town Meeting.

KXA, Seattle, was granted a six month extension of their AM station license.

OUR SAD HOPES FOR "NETWORK" TELEVISION

The telephone company recently announced that no plans have been made at this time for an installation which could carry TV network programs to the Portland, Seattle and Spokane areas. Some experimental work is being done but nothing definite is planned.

This leaves the network transmission schedule reaching only as far north as San Francisco. The San Francisco to Los Angeles link will be completed late this year and the Chicago to San Francisco link will be completed during late 1951.

Town Meeting of Radio Technicians To Have First West Coast Session

Vancouver, B. C., on June 5th, 6th and 7th will be the place and dates for ALL West coast radio technicians who want to keep up with knowledge of "their" business. For the first time, the west coast has been granted a session of the "Town Meeting of Radio Technicians," which has proven so enlightening and popular in Boston, New York City, Montreal, Philadelphia and Toronto in past years.

This first session on the west coast is being sponsored by the Associated Radio Technicians of British Columbia. That organiation hopes to have a large attendance come from our Pacific Northwest. Information concerning the program of events and hotel or auto court accommodations is being sent to all northwest distributors so that interested servicemen will have easy access to it. In Seattle, the man to consult is Nick Foster, radio instructor at Edison Vocational School, (who is an honorary life member of the Associated Radio Technicians of B. C.).

A partial listing of subjects to be covered at the June 5th to June 7th meetings (which can be considered "bread and butter" information to the radio serviceman) include: Television, systematic servicing in the shop, what public thinks of repair technicians, advertising, business systems in the service shop, interference and what to do about it, how to use sweep generators and oscilloscopes, practical antenna installations, knowing how your business stands—financially, records versus wire or tape recording, test equipment demonstrations, record player clinic and other important topics.

Seattle representatives attending the sponsoring organization's council meeting earlier in May were: Nick Foster, of Edison Vocational School; Ed Marchant, of Local 46 I. B. E. W. (Seattle's radio servicing union); and Clarence Ramsey, of the executive board of the Master Radio Servicemen's Association, of Seattle.

They mentioned plans included an entirely educational forum which would be free from any advertising or selling. The registration fee for the entire three day program is two dollars. All other expenses are being paid for by contributions from the radio industry. Tuesday and Wednesday are the most important days of the program if any of the technicians can't spare three days time.

It is requested that all planning to attend this important meeting contact Ed Marchant, at Mutual 0046, Seattle, so that all available cars may be used to provide transportation for every radio serviceman who would like to attend.

Vancouver hotel reservations and the meeting registrations can be had by writing to Mr. P. M. Donald, Town Meeting of Radio Technicians, 570 Dunsmuir Street, Vancouver, B. C.

Coy Discusses T - V Freeze

(Continued from Page 1.)

devoted to rebuttal briefs. Approximately June 26th the F. C. C. will make their color decisions. Then come at least five or six weeks of processing two thousand TV station applications from three hundred cities. Then there will be the job of allocating TV channels. (One interesting point was the possibility of recalling a Tacoma TV channel previously granted.) On November 1st would be decisions on two thousand requests for the shifted channels. Final estimate on lifting of the freeze was then given as early in January.

Mr. Coy pointed out other "delays" which had to be properly considered during this time, one being the requests of the telephone company. They have applied for the lower part of the present TV band (470 to 500 Mc.) to be used for mobile radio-telephone communication service.

Unless there are additional applicants in the Portland area which would exceed the present number of channels available Portland allocations will probably arrive about March 1951. It would then be a matter of four or five months before a station could be put into actual operation.

Portland, at the present time, has five VHF channel assignments and one UHF. There are now five TV applicants. It does not seem feasible that any of these applicants would "prefer" to be on UHF with no receivers capable of receiving those frequencies in the Portland area. Nor does it seem as likely that the potential TV receiver buyer would just as quickly buy a VHF receiver and UHF converter as he would a VHF receiver only. This places that UHF channel in somewhat of an undesirable category at this early television stage. IF Portland has a sixth applicant for a TV channel it seems likely that a VHF assignment would be desired. The outcome would be six applicants with five channels considered "good" and one considered "dead." A decision would then fall into the hands of the F. C. C. and place Portland back on a "F. C. C. hearing" waiting list. Therefore, IF Portland does not have a sixth applicant for the VHF band, it seems likely that Portland will have TV in the fall of 1951.

The editor asked Mr. Coy about his attitude toward a UHF assignment in this area. Mr. Coy mentioned his belief that the small number of VHF receivers in circulation in the northwest was not sufficient to give a UHF station applicant the feeling he has lost part of his potential listening public. He also stated that one leading manufacturer brought forth a UHF converter which proved efficient and extremely compact. It was designed to be placed at the base of the antenna with the standard TV transmission line feeding the VHF receiver. (This would give coverage of both bands and the converter would not be apparent to the viewers.)

PRECISION MEETINGS ARE SCHEDULED

June 1st and 5th are the scheduled dates for the Precision Apparatus Company lectures and discussions on television circuitry, alignment practise and trouble shooting.

The June 1st meeting will be held in Seattle, at 8:00 P. M., in the Masonic Temple, located at Harvard and East Pine Streets. Distributors sponsoring this meeting include: General Radio, Pringle Radio, Radio Television and Appliance, Wible Radio, Herb Zobrist Company and A. T. Stewart Company.

The June 5th meeting will be held in Portland, at 8:00 P. M., in the Benson Hotel, located at Broadway and Stark. Portland sponsoring distributors include: Lou Johnson, United Radio, Central Distributing and Northwest Radio Supply.

R. G. (Bob) Middleton, senior engineer of Precision's design and application engineering section, will conduct the meeting.

On April 28th the F. C. C. dismissed an application submitted by Paul W. Hand, Millwood, Washington, for an AM station to run 250 watts unlimited operation on 1340 kc.

KALE, RICHLAND, IS NEW AM-FM STATION

KALE, Richland, Washington, came on the air early in April with an AM station running a kilowatt on 900 kc. This was followed a few weeks later by their FM station running 585 watts on 103.9 Mc.

The equipment used at the AM station includes a General Electric 1 kw. transmitter and a 350 foot tower. The FM station equipment includes a Raytheon 250 watt transmitter and a 2 bay Cyl-Ray antenna which is mounted on top of the AM tower.

KALE-FM is the first FM station in eastern Washington. To aid the radio servicemen in that area covered by KALE a special meeting was held May 12th, in Richland for the purpose of teaching service and alignment technique and other information relative to FM reception. The material for this meeting was prepared by Max Bice, chief engineer of KTNT (FM) of Tacoma, and Lloyd Norberg of C & G Radio Supply, also from Tacoma.

KALE-FM, Richland, Washington, recently received a license to replace their construction permit.

Bonneville Microwave

(Continued from Page 3.)

tana where it will connect to the Montana Power Company. Another branch shows the last microwave relay station in northwestern Washington, at Snohomish, joined to the B. C. Electric Railway Co. Ltd., in Canada, via power line carrier.

The Portland-Vancouver area, which represents the heaviest point in the traffic system, shows a future requirement of twelve channels leaving the area headed north, eight channels going south, and twenty extending northeast.

Completion of the first section of the microwave relay system is scheduled for June of 1950. The equipment used for this part of the system is made by Federal Telecommunications Laboratories and operates in the 1700 to 1850 megacycle range. It will join the Portland-Vancouver area with the Covington substation (20 miles southeast of Seattle), the Snohomish substation (25 miles north of Seattle), and the Olympia substation (near Olympia). The Federal equipment uses pulse time modulation and is capable of handling twenty-three voice channels on the same r. f. carrier.

At the Covington substation will be erected a parabolic reflector type of antenna whose height and location will permit line-of-sight contact with the microwave relay station on Squak Mountain, 12 miles distant. The Squak Mountain site will be shared by three services: Bonneville, the Washington State Police and a future radio broadcast station. From the top of a fifty foot tower located on Squak Mountain (elevation 1980 feet) there will be another direct path established to the Snohomish substation, twenty-nine miles away. The Squak Mountain spot will also serve Olympia, Seattle and possibly Tacoma at a later date.

The second section of the microwave link is scheduled for completion during the fall of 1951. This section will join Vancouver-Bonneville-Grand Coulee-Spokane. Philco equipment is to be used for this section and will operate in the 7125 to 7425 megacycle band. The Philco system uses pulse amplitude modulation.

To guard against upward "bending" of the r. f. carrier the minimum distance between any point in the line-

(Continued on Page 10.)

New Northwest Products

A new hi-power, completely portable F-M communication unit was just announced by Radio Specialty Manufacturing Company, Portland. The new unit, known as type 1144, provides a power output of 7.5 watts in the 30 to 40 Mc. range, and 6 watts in the 40 to 50 Mc. range. Provision for "low power" would reduce power output to as low as 1 watt, thereby conserving batteries after contact has once been established.

The weight of the unit (complete with light duty batteries) is only 19 pounds 8 ounces. Medium duty batteries, which will last approximately 72 hours, would increase the overall weight to 28 pounds 2 ounces. Dimensions are 6½" x 12½" x 11¼".

Automatic squelch is included to keep the unit quiet during stand-by operation. Either loudspeaker or headphones may be switched into the circuit. All controls are located on top for easy access. Can be used with portable or fixed antenna.

When the unit may be in prolonged service an external power supply or extra heavy duty long life batteries may be "plugged in" to supplement the light weight self contained batteries.

N.. W. RADIO MANUFACTURER GETS BONNEVILLE CONTRACT

The Bonneville Power Administration announced, May 19th, it has awarded Radio Specialty Manufacturing Company, Portland, a contract for mobile radio telephone equipment. Contract amount is $10,895.

KNEW, Spokane, modified their directional antenna array, changing from two to four towers and shifting frequency from 1430 kc to 790 kc. The station is running different directional patterns day and night. Fisher towers were installed and Johnson antenna control equipment.

The Washington State Association of Broadcasters met on April 29th at Wenatchee, Washington. One of the most interesting developments was a resolution asking the state superintendent of public instruction and/or the courts to decide that "the State High School Athletic Association has no authority to sell school contest broadcasting rights."

The latest Seattle survey showed 29,000 television receivers in KING-TV area homes.

Bonneville Microwave

(Continued from Page 8.)

of-sight path and tree-top will be one hundred feet. To prevent another microwave frequency offender, phase distortion (created by multiple signal paths), there will be diversity reception provided over the longer hops. This will mean dual antennas and receivers with the antennas pointed on different paths which the microwave signal will travel. Then if "flutter' or "slow fade" occur due to one of the paths being affected (such as by abnormal variations in the atmosphere) the other receiver will provide constant level reception. Flutter, which may be visibly seen on television received signals, is produced by the changing phase of a secondary signal being received on another reflection path as the reflecting object increases or decreases the time lag of this signal. It is a resultant varying phase of this secondary signal with the constant phase of the primary signal that causes the additive and subtractive effect in total combined signal level received.

The Bonneville system is being planned in such a manner that all important circuits form closed loops. Then, if any station is completely cut off, the communication services to all others can still be maintained. To prevent any "off-the-air" situations from arising, each relay point has substitute power facilities which are automatically cut in if the a. c. line fails. Upon power line failure, the equipment is switched via relay to battery operation. If the battery is in use for a prolonged period of time a gas-engine driven generator starts up to relieve the battery of the load. To prevent loss of a few cycles during the relay cut-over period there is a three unit motor-generator set operating constantly. It normally gets its power from the a. c. line. When a power failure occurs the generator is turning over at the correct frequency and "coasts" through the three or four cycle delay while the battery power (125 volt battery) is cut into the circuit. Then the battery continues to run the m-g on d. c. until the a. c. line is once again restored.

When choosing the mountain sites for the relay stations the high point decided upon must be readily available during all seasons of the year (which eliminates many mountain peaks) and the sites must allow an economically short line voltage run.

NO T-V FOR THE DRIVER

The State of Virginia approved a bill making it unlawful to install TV in a car, truck or bus where the driver may see it. Other states also approving this measure are New Jersey and Massachusetts. States vetoing such a bill were New York and Kentucky.

Blackfoot, Idaho, new AM station granted to Blackfoot Broadcasting Company which will run 250 watts unlimited on 1490 kc.

Raymond, Washington, new AM station granted to Pacific Broadcasting Corporation. Will run 250 watts unlimited on 1340 kc. Estimated construction cost is $7,300.

North Bend, Oregon, AM station permit filed for 1340 kc. 250 watts unlimited. Estimated construction cost is $17,760.

SHELDON SACKETT CONTROLS KRSC, SEATTLE

P. K. Leberman, Robert E. Priebe and John E. Ryan, Jr. (Radio Sales Corporation) received Commission approval April 21st on the transferring of station KRSC to Sheldon Sackett for $112,500.

KMED, MEDFORD, BEING SOLD

KMED, Medford, Oregon, is awaiting an F. C. C. decision on the sale of the station by Mrs. W. J. Virgin to Radio Medford, Inc., for $290,000.

KLIX, Twin Falls, Idaho, filed for modification of their construction permit to change from 1310 kc. 1 kilowatt unlimited operation to 1310 kc. 5 kilowatt day operation and 1 kilowatt nights.

KAST, Astoria, Oregon has been granted permission to modify their license from the use of a directional antenna both day and night to a non directional antenna days and directional nights provided they can satisfy complaints of blanket interference occuring within the 250 mv/m contour.

KFIO, Spokane, was sold to Louis Wasmer by Arthur L. Smith (Spokane Broadcasting Company) for the sum of $30,000. Mr. Wasmer, who recently sold KGA, Spokane, to Gonzago University, also has 43% interest in KOL, Seattle, and 22% interest in KXLL, Missoula. The Commisison granted the transfer May 18th.

SPOKANE STATION SHIFTS

KREM, Spokane independent station, had been granted permission to increase its power from 250 to 1000 watts with a shift from 1340 to 970 kc.

President Cole E. Wylie, states he has purchased property on Moran prairie, Spokane's Radio Hill. Construction of a new transmission building and erection of two directional-ray towers wil begin immediately. The present down-town studios and offices will remain in the Realty Building.

The station now carries the Western International League baseball games.

KBRC, Mt. Vernon, Washington, which has been running 500 watts on 1430 kc daytime operation, is adding another tower for night operation and has installed Western Electric control equipment.

KBND, Bend, Oregon, has just completed the installation of a two-tower directional antenna array. Towers are Blaw-Knox and the antenna control equipment is Johnson. This change was made when KBND increased power from 250 watts to 1 kilowatt.

SCREWDRIVER MECHANICS GOODBYE

Mr. Walt Howe, television department head of North Idaho Junior College, mentioned in a recent letter . . . "The course is difficult. There just isn't room, anymore, in the technical field for the screwdriver mechanic. We do not intend to mass-produce radio operators or radio servicemen." Further paragraphs mentioned the recognized high college level of the school and its dissimilarity to a trade school. Also mentioned were the school's plans to start construction of their "second" television camera.

CLASSIFIED

WANTED—All kinds of radio parts, tubes, sets and equipment. Distressed or overstocks. Gordon Luther Co., 106 Prefontaine Place, Seattle 4, phone MAin 7233.

WANTED—RCA Magic Wave transformers Nos. 9849, 9814, 9813. Pay net plus 15% for postage. Move that obsolete stock now. Norwest Radio, Shelby, Montana.

FOR SALE—Presto 6-N Portable Recorder. 85-E Amplifier and Preamplifier with microphone and accessories. Best offer. H. C. McClain, 9603 Roosevelt Way, Seattle. VErmont 2280.

Seattle's F-M Outlook Brighter

Seattle, Wash.

I have just read with great interest your story on FM in the May 1st issue of "The Northwest Electronic World."

I was very pleased to see you take the stand you did on FM but I must take issue with you on one point . . . KISW FM's recent curtailment of operating hours. "KISW (FM), a small independent located in the North end of Seattle, is still fighting but it is being forced to trim its staff down to the barest skeleton" is the paragraph I particularly refer to.

True we are still fighting but we feel and have proof that it now is a down hill struggle. Things are beginning to look good. We were NOT forced to trim our staff down to the barest skeleton except for one condition—management. A new, permanent staff is now being built and soon, posibly within two months, KISW-FM will again be operating a minimum schedule of 14 hours per day. Our original plan still holds and we are looking forward to the day KISW-FM will bring, good music, news, drama and BETTER PROGRAMMING on a 24 hour basis.

. . . .Mail response to some of our live as well as transcribed programs is received daily from such places as Tacoma, Olympia, Toledo, Enumclaw, North Bend, Everett, Oak Harbor, Tenino, Puyallup and Caslte Rock as well as Seattle and the immediate vicinity.

Sincerely,
Ellwood W. Lippincott,
Owner, KISW-FM.

(Ed. note — Sorry about the misleading statement. Best of luck on your good intentions.)

KBPS, Benson Polytechnic School, Portland, was granted increased station hours from 10:30 A. M. - 6:30 P. M. to 10:00 A. M. - 10:00 P. M. Monday through Friday and an increase in power from 100 watts to 250 watts on 1450 kc.

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25c Each—5 for $1.00

1626—15c Each 1629—10c Each

810's—$5.50, while they last 813's—$6.50 and up

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12SK7	1633	5U4G	25L6G
12SR7	1634	6SC7	6K7G
12SF7	955	6V6G	6K8G
12K8	12A6	VR-150-30	6B8G
12SH7	7C7	7C5	7F7
EF-50	7W7	7Z4	7A4
E-1148			

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MASTER RADIO SERVICEMEN UNANIMOUS ON TV SERVICE RATES

At the May meeting of the Master Radio Servicemen's Association it was quickly determined by majority opinion that TV servicing should be based upon a scale of $5.00 an hour. The rate for service calls would begin at $5.75 for the first twenty minutes and continue on at the $5.00 per hour rate.

Efforts to "break down" the television servicing charges by receiver troubles proved to be unsatisfactory. Members and non-members were surprised to see the servicing rates used by different shops so close to the $5.00 an hour figure that there was little opposition to standardizing on that figure. Members were not required to use this scale. It was merely arrived at for their guidance.

The chart of radio service rates (page 15) originated in Spokane, Washington, and has been adopted by the majority of radio service shops in that area. This chart is one of four which are classed as: Home Service Calls (including pickup and delivery charges), Home Radio Bench Rate, Phonograph Record Changer Bench Rate and Auto Radio Rate. Once again, in reference to our March issue published "Seattle" rates, these service charges should be considered for a comparative measuring stick by those technicians whose shops are located in more rural areas where shop overhead is lower. The March issue chart, and this one also, should merely provide you with the information necessary to set up your own standards for your own locality.

This information was sent in by Frank C. Baxter, N. 11 Browne, Spokane, and represents the standard servicing charges used by the following shops: Spokane area: Baxter Radio, Zoerb Radio Service, Brown-Johnston Co., Commercial Service Co., Crawford Electric, Lonnies Radio and Television, Modern Radio, Riegel Brothers, Orens Radio and Electric, Spokane Appliance Repair, Holmes Radio. Lee's Radio and Key, Wilco Radio, Acme Electric, Excell Radio, Washington Electric, Hughes Radio, Earl Goble Service and Cook's Radio and Appliance. Other shops using these rates are Ritzville Electric, Ritzville, Washington, and Carrick Radio, Couer d'Alene, Idaho. This represents a "non-associated" group.

RADIO SERVICE RATES

(Based upon the Spokane service charges)

BENCH RATE FOR HOME RADIOS

The following listings are arranged in the manner of servicing step-by-step procedure.

1. Remove, clean, check, estimate and reinstall chassis.	
A. Simple small chassis	$2.00
B. Simple large chassis	4.00
For multiple units, add each	1.50
C. Complex mount	6.00
For multiple units, add each	1.50
2. Checking tubes (over six)	1.00
3. Check, repair or replace power cord or switch	1.00
Add cost of parts	
4. Volume or tone controls	
A. Lube and clean	1.50
B. Replace, standard control	4.75
C. Replace, special control	6.50
If switch is used with B or C add cost of switch	
5. Dial drive replacement	
A. Simple cord	2.00
B. Complex Cord	3.50
C. Special drive mechanisms (add cost of parts)	4.00
6. Dial pointer or scale	
A. Simple replacement, add cost of parts	2.00
B. Special replacement, add cost of parts	3.50
7. Tuning condenser repair or replacement (add cost of part if replacement). Per each section	1.50
8. By-pass or coupling condensers, paper or mica	3.50
Each additional unit	1.50
9. Resistor replacement	
A. 2 watt capacity or less	3.50
Each additional replacement	1.50
B. If power capacity exceeds 2 watts (add part cost)	4.00
10. Filter condensers	
A. Single unit, 250 W. V. or less, add cost of part	4.00
For additional sections, add each	1.00
B. Single section, over 250 W. V. rating, add cost	6.00
For additional sections, add each	1.50
11. Switches, band and pushbutton types	
A. Clean and adjust, per each button or section	.75
B. Replace and adjust section, add part cost	3.00
C. Replace and adjust push button	1.50
12. Coils, r. f., i. f., oscillator, loop or trap	
A. Repair standard	3.00
B. Replace standard, add cost of part	5.00
C. Replace special, add cost of part	6.50
13. Alignment	
A. I. F., simple AM receiver	1.50
B. I. F., complex AM receiver	3.00
C. Detector Oscillator, simple AM receiver	1.50
For each additional band	1.50
14. Transformer-choke replacement	
A. Audio, output transformers or filter choke, add cost	5.00
B. Power transformer, mounting (add part cost)	5.00
C. Connections cost, per each lead	.25
15. Speaker	
A. Centering cone	1.50
B. Replacement, 6" or under (add cost)	2.00
C. Replacement, over 6" (add cost)	3.00
Add 1.00 to above for special replacements	
16. Phonograph or headphone connections	
A. Simple installation, plus cost of parts	4.00
B. Complex installation, plus cost of parts	6.00
17. Relays and Tuning Motors	
A. Adjust each	2.00
B. Replace each, plus part cost	3.00
18. Tube socket replacement	
A. Mounting charge	2.00
B. Charge for wiring, per terminal	.25

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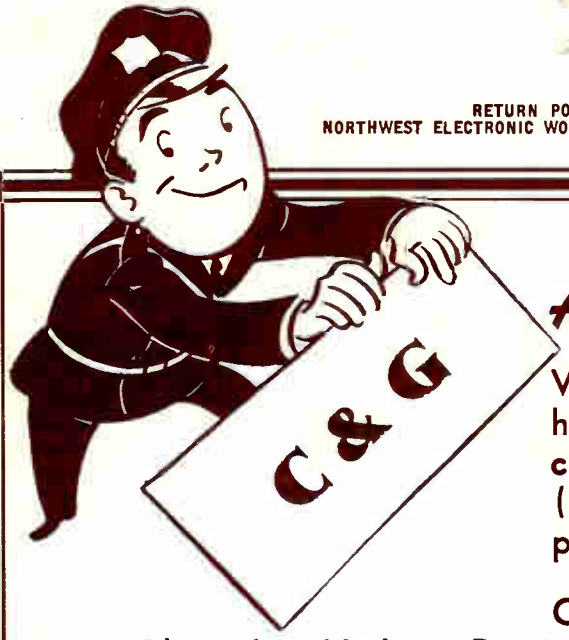

Announcement!

We at C & G Radio Supply Company are happy to announce our appointment as Exclusive Washington Distributor for Colonial (Sylvania) Auto Radio and Television replacement and warranty parts.

Colonial is now building Ford, Lincoln, Mercury, Chevrolet, Hudson, Pontiac and Oldsmobile auto radios. Parts are obtainable for Ford Detrola and others from this same source.

If you are interested in factory authorized warranty service on any of Colonial (Sylvania) manufacture, please send full particulars to us and we will arrange to have a factory man call on you.

—C & G RADIO SUPPLY CO.

We will ship on or about June 1st Place your orders now—

Standard "A" base, 4-prong vibrators . . . equal to Radiart 5301.

Quantity	Net Each
1-9	1.35
10-49	1.30
50-99	1.25
100 or more	1.20

Standard "F" base, 4-prong (wide spaced) . . .equal to Radiart 5335.

Quantity	Net Each
1-9	$1.50
10-49	1.45
50-99	1.40
100 or more	1.35

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