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Founded 1909

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In the Radio Club of America

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NEW MEMBERS, ADDRESS CHANGES

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THE RADIO CLUB OF AMERICA, INC.
P.O. Box 2112, Grand Central Station, New York, N.Y. 10017

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The Radio Club of America, Inc.

Price $1.00

BOX 2112, GRAND CENTRAL STATION, NEW YORK, N.Y. 10017

Organized for the interchange of knowledge of the radio art, the promotion of good fellowship among the members thereof, and the advancement of public interest in radio.

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THE PRESIDENT'S MESSAGE

Much has transpired involving the Club since the last issue of the Proceedings earlier this year. Most of the news is good, but with much sadness we have to report the passing along of a number of our respected members which tempers the news. Details on members no longer with us is reported in this issue.

The good information begins with the report that we now enjoy the greatest strength in membership in the history of the Club. Near 600 active members in good standing, with the lowest percentage of delinquent dues obligations we have ever enjoyed. Unfortunately, whether by neglect or error, those very few names not current in dues by the time you read this have been dropped from the membership list. Consequently, if there has been a mixup in the records we want to know about it. We do not want to drop any members if at all possible.

Key moves during the year include a very active program to have the Club establish a Non-Profit Status. Possibly by the time you read this our formal application will be in process and maybe we can announce acceptance of this request by the State and IRS at the Banquet in November. This new status, now sought, will not only provide us with a Non-Profit Tax Exempt situation, but will make it possible for any members or friends desiring to contribute to our efforts in any way to have such contributions be in the tax-exempt category.

Following the unprecedented success of our most recent past annual banquet, of 1973, we once again look forward to another record-breaking affair this year. The Banquet Committee under Jack Poppele has been active in preparing for this event for months, and we believe our guest speaker, Director William Nicol, of the British Home Office in London, will maintain this high level as a Club member worthy of the company he joins: in recent years the highly regarded Senator Barry Goldwater in 1973; Prose Walker of our FCC in 1972; Edgar F. Johnson in 1971; Bill Lear in 1970; and Andrew Inglis in 1969. All these key speakers are members and Fellows of the Club and represent a fine cross-section of our distinguished membership.

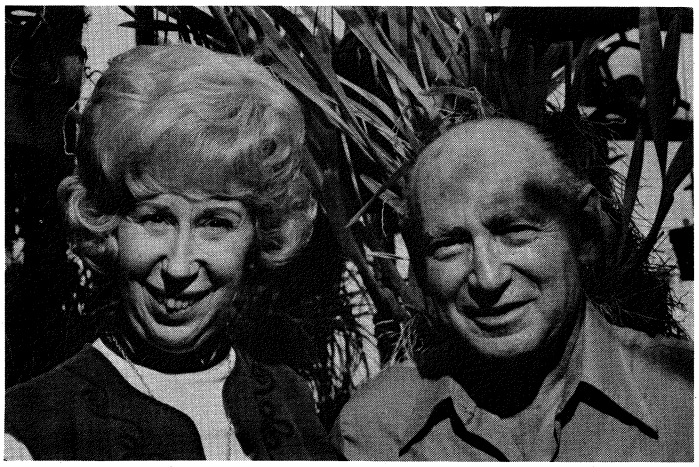
In this past year we have added a number of very prominent people to our membership and I am personally very proud of the quality and position in our industry that these new associates bring to the Club. A look at the list of new members for 1974 will tell the story.

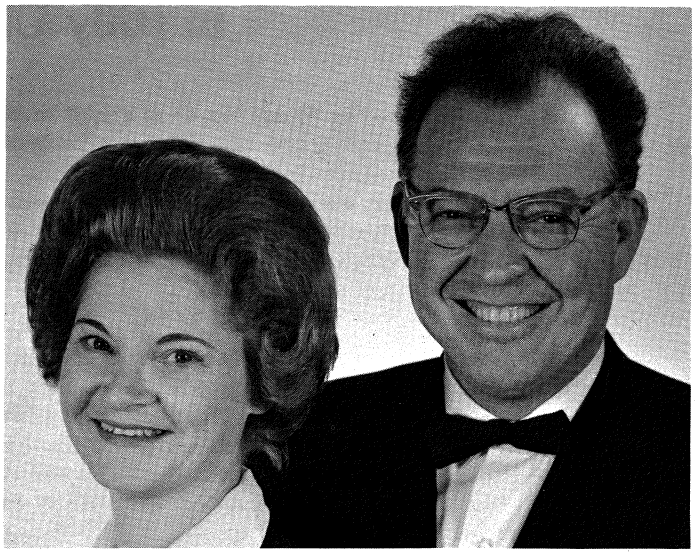
We are proud this year to honor a few of our distinguished members with special awards. This detail is covered in separate items in the Proceedings. In any case my personal best wishes and congratulations in our newly honored Armstrong Medal winner, Dr. Lewis Hull; our Sarnoff Citation winner, Jack Poppele; and our new Honorary Member, our former Director George Bailey. Our congratulations go to all the 20 new Fellows of the Club as well.

The Board of Directors is presently considering a new class of Award. This would be known as the Merit Citation, to be awarded annually to a limited group of prominent members for their contribution to our industry other than in a purely scientific area . . . or in invention. No final decision has been made on this proposal at this time.

A final thought — the Club financial position is in the best position it has been in years, thanks to the cooperation of membership, our many advertising contributors, and our hard-nosed Treasurer, Dave Talley.

CLUB'S FIRST MAN-AND-WIFE TEAMS





Marguerite and David with their orchids, above. LaNeil and Bill Eitel, right.

David and Marguerite Warshaw, of Valley Cottage, N.Y., are the first man and wife to become members of the Club. Both are pioneers in the radio art — Dave was one of the amateurs heard by Paul Godley in the 1921 transatlantic tests, and Marguerite had an educational radio program in Akron, Ohio, in 1933 — and both are following the art today.

Dave went to sea as an operator shortly after the Transatlantic tests. Later transferred to shore work, he operated at a number of stations, including WCG, WSA and WSH in New York. In 1933 he went to work for Mackay Radio, later a part of ITT.

During WWII he began to develop radio propagation forecasts, reporting to the government and his company on the expected best propagation routes for various overseas communications routes. In connection with this work he developed his electronic technique for the detection of solar flares, with which he still works as an avocation. The solar flare has a definite and devastating effect on the reliability of long-distance radio communications, and a knowledge of the occurrence and probable intensity of such a flare is important to world-wide communications networks.

Dave has now designed a late model solar flare detector, using all integrated circuits and a shielded loop. Technical publications are always glad to print stories on such devices and give constructional details, and Dave, a solar flare detection network organizer, and a member of the American Association of Variable Star Observer (our sun is a variable star) is equally anxious to get the word out to all persons who may be interested in following and reporting on solar activity.

Marguerite is one of the pioneers of education on the air. In 1933 she started a junior science radio program, "Have You Heard?" (for instance, "that there are 12 motions of the Earth," or that "there is a water plant that catches fish and eats them?") This program caused her to be invited to a "Radio for Education Institute" convention at Ohio State University, where her demonstration attracted the attention of the U.S. Office of Education. Called to Washington, she created for the Office two nation-wide programs, "Have You Heard?" and "The World Is Yours." Later she moved to New York and continued to write the "Have You Heard" program for NBC. Now in semi-retirement, she has three shows "Video Soapbox," "Lets Talk About" and "The Marguerite Warshaw Show," on the Rockland (NY) Cablevision system.

Aside from her TV work, she devotes herself to two hobbies, orchid-growing and buyer protection. She was introduced to the latter when, a week after moving into her newly built home in the country, she found the roof leaking and the cellar flooded. Finding similar conditions in homes constructed by the same developer, she formed the Quaspeck Park Aggrieved Homeowners Association. This group has been effective enough to compel builders to compensate owners for faulty construction, and is inspiring local laws to protect home buyers not only against shoddy work but also for local laws to bond would-be builders to insure that they fulfill their contracts.

A FAMOUS WEST COAST COUPLE

The Club's second man-and-wife team is Bill and LaNeil Eitel, W6UF/WA7LRU and WB6MRW/WA7LUN, respectively. Oldtimers will remember Bill as the "Ei" in Eimac (Eitel-McCulloch transmitting tubes). Now in semi-retirement, he tells us that though he left Eimac-Varian last January, they still provide him with an office and secretary, and he gets down there about twice a week.

About six years ago, the Eitels started a gradual retirement, buying a ranch in Dayton, Nevada and established a home there. Bill also bought a 14 x 60-foot trailer for ham shack, office, library, instrument calibration and instrument service.

Both the Eitels are high-speed telegraphy enthusiasts, but their amateur activity, especially with the early (OSCAR) amateur satellite program, was interrupted by work with the ranch, and only recently have they got back into activity, assembling an OSCAR station "to put Nevada on the map."

LaNeil has the distinction of making the first ham contact from Nevada via satellite (OSCAR 6) last May 14, when WA7LUN contacted a station in North Carolina. Her hobby of high-speed telegraphy does not get much use in satellite work, where code speeds are often 15 to 25 wpm. However, she handles most of the family's satellite contacts and has given more than 100 hams their first and only contact with Nevada.

LaNeil and Bill have both been in the hospital since the above was written. More information in the Newsletter accompanying this issue.

450 MHz vs 900 MHz Mobile Radio*
In Hilly Urban Terrain

Below is a talk delivered by Stuart Meyer to a joint meeting of the Radio Club of America and the Vehicular Technology Group, IEEE, at the Mechanics Institute, 20 West 44 St., New York, May 21, 1974. The work of reporting on the tests, in which Mr. Meyer participated, was assigned to Frederick A. Barton and Gregory A. Wagner of RCA Mobile Communications Systems, and their report was printed in the Vehicular Technology Conference Record, December, 1973. Readers may obtain greater detail from that publication. Since Mr. Meyer's presentation was a paraphrase of that paper, it is printed here with the permission of the IEEE and under their copyright.

The previously experimental 900-MHz band has been opened — less than three weeks ago — by the FCC. Studies in a number of cities (Chicago, Washington, Philadelphia, New York) have already established the viability of practicable 900-MHz systems. Since the terrain in those studies was relatively flat, it was important to find out how 900-MHz systems behave in more hilly areas.

The rolling hills, deep valleys and thick tree cover of Pittsburgh made it an excellent region for additional study of 900-MHz performance. We made a comparison with the 450-MHz mobile band in terms of:

a. Voice modulation performance (qualitative only)
b. Field strength variation (quantitative)
c. Data message transmission (quantitative)

To compare the two bands fairly, it was necessary to develop 900-MHz transmitters, receivers and antennas with performance equal to those already available in the 450-MHz band.

Fig. 1 is a map of the Pittsburgh area. The average terrain elevation is 1000 feet (156 m) with peak-to-peak variations of 500 feet (156 m). The three rivers are bordered over much of their length by steep 300 to 400-foot cliffs (94 to 125 m). Because of this rough terrain, there is essentially no line-of-sight operation outside the downtown district, and multipath propagation is the rule for most of the area. The concept of open radials and cross streets has no significance here, as terrain eliminates the possibility of any grid-work of streets.

Fig. 1. Map of the Pittsburg area.

Test Equipment Set-Up

The tests and measurements were made with a base station transmitting site on a large apartment building, which was on a 400-foot (125 m) bluff overlooking the city, and was already in use by several other radio systems. A mobile van (Fig. 2) was used for the receiving control and instrumentation equipment. Fig. 3 shows the complete system.

Both the 450 and 862-MHz transmitters at the base station were operated unattended and were remotely controlled from the mobile van. A 150-MHz control link controlled transmitter carrier on/off and modulation on/off functions. Audio for the test signal was on a broadcast type cartridge tape player fed to both base test transmitters.

A standard-product base station was used as the foundation for the 862-MHz transmitter (Fig. 4). The low-level 150-MHz amplifier drives a 450-MHz tripler stage. The 150-mW (21.8 dBm) output from the tripler drives a parametric transistor doubler to an output of 250 mW (24 dBm) at 862 MHz. The doubler uses an inexpensive CATV transistor and is built with etched inductors on teflon board. Its output is fed to a three-stage thin film hybrid amplifier module which produces the 10 watts (40 dBm) necessary to drive the final amplifier tube.

This multiplication eliminates the need for a high-level varactor multiplier with its undesirable spurious products. Operating at 100 watts (5 dBm) output, the tube cavity amplifier feeds an 8.5 dB omnidirectional vertical colinear antenna, and including feedline losses produces an effective radiated power of 560 watts (57.5 dBm).

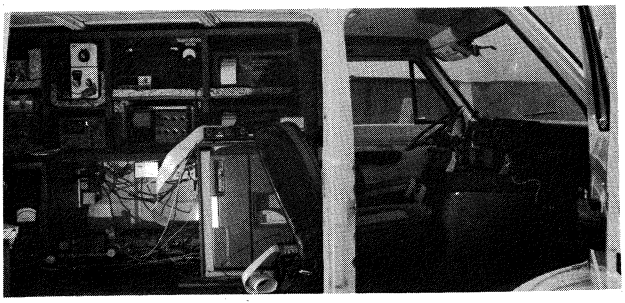


Fig. 2. The van used in the tests.

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A standard-product 450-MHz receiver was modified — using inexpensive and available components — for 862-MHz operation in the mobile van. See Fig. 5. Adding a hot-carrier diode mixer, bipolar RF stage and 862-MHz RF selectivity produced a basic triple-conversion receiver with a sensitivity of 0.4 μV (-116 dBm) for 20 dB quieting. By using the local oscillator multiplier output for two conversions, only one multiplier chain was needed. A single-stage RF preamplifier was added to improve the sensitivity to 0.25 μV (-110 dBm) for 20-dB quieting.

The standard-product 450-MHz receiver for the van had an optional RF preamplifier, producing a sensitivity of 0.25 μV (-119 dBm) for 20 dB quieting. Mobile receiving antennas for both 450 and 862 MHz had 5 dB gain.

Signal strength was recorded on a strip chart recorder for immediate monitoring and on magnetic tape for more detailed analysis later.

The output level of the first stage of the 455-kHz amplifier in the receiver is linear with RF level inputs between 0.1 μV and 10 μV (-87 dBm).

After linear amplification, the 455-kHz signal is rectified in a full-wave detector. A logarithmic amplifier converts the DC output from the detector into a linear dB scale with a 40-dB dynamic range.

Measurement Method

Real-time sampling of signal level data would not be suitable for statistical analysis, as the speed of the van must vary according to local traffic and load conditions. This would cause a false weighting of the data, since the time spent in high traffic or on poor roads would be longer than on other portions of the run. These areas may or may not be high or low signal areas, and would introduce unpreditable uncertainty into the data. Real-distance information, however, is quite appropriate as a sampling mode. A commercial distance measurement unit that produces output pulses at programmable intervals of driven distance was used to provide sampling triggers for analysis.

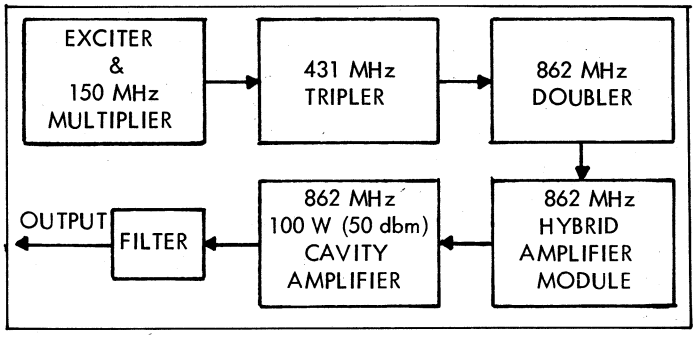


Fig. 4. The 862-MHz transmitter.

Normally programmed to provide outputs at 50-foot (15.6 m) intervals, the distance information was recorded on one event channel of the chart recorder and on a separate channel of the tape recorder. After an analog-to-digital conversion over 50-foot sample and hold intervals, triggered from the distance channel of the tape recorder, the varying DC outputs from the logarithmic amplifiers can be statistically analyzed.

Chan. No.	Type	Information
1	Direct	450-MHz receiver audio output or tape recorded notes
2	Direct	862-Mhz receiver audio output
3	FM	450-MHz signal strength
4	FM	862-MHz signal strength
5	FM	Distance marker signal

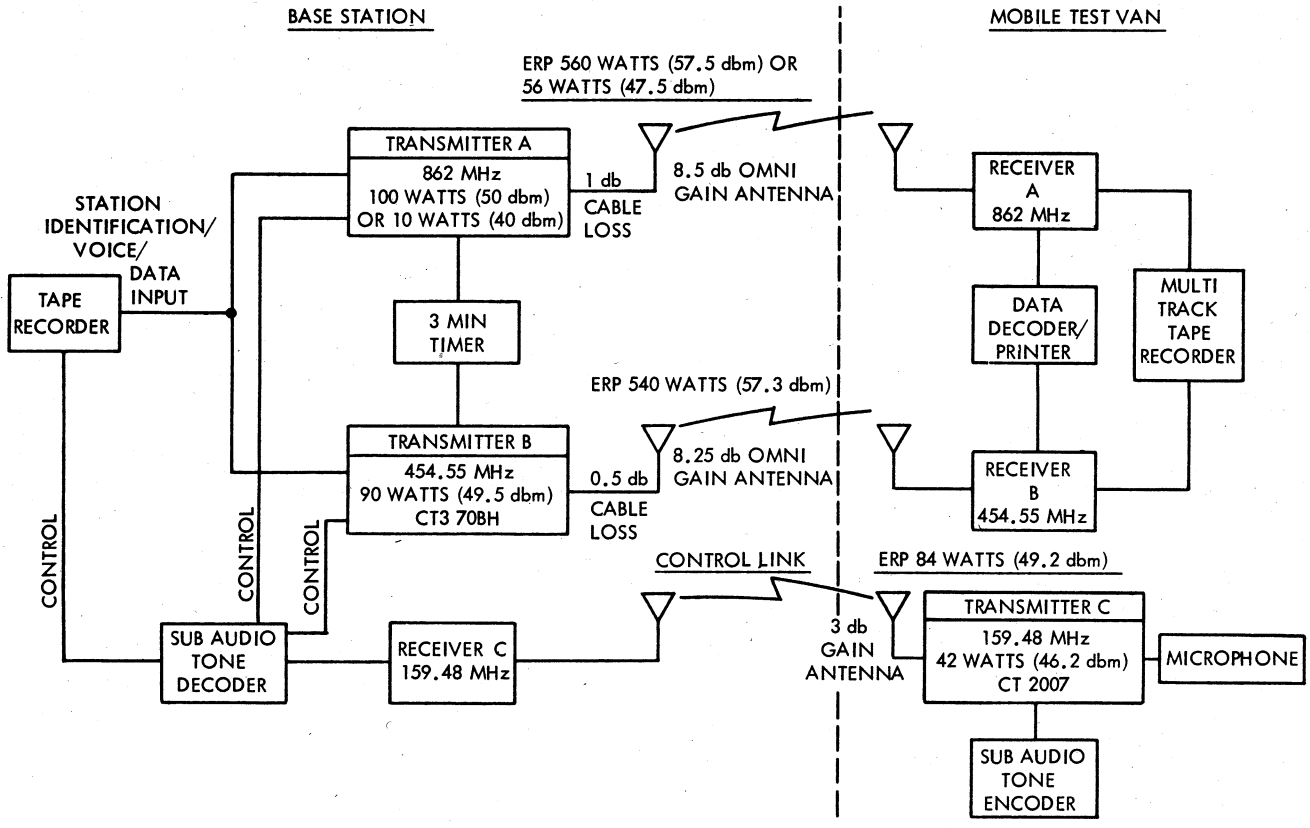


Fig. 3. The complete test setup; including base station and mobile van.

Calculations of the effects of antenna beam width on signals received at various elevations in the area of measurement show that these should not be significant. This has been confirmed in the test measurements. One area, Saw Mill Run Boulevard,

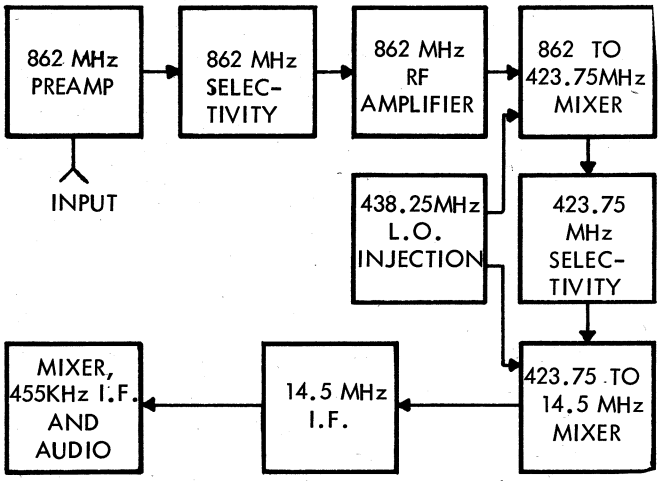


Fig. 5. Receiver for 862 MHz.

which is only 0.8 mile (987 m) from the base station and is in the shadow of a 400-foot (125 m) cliff shows a relatively low but still usable signal at 862 MHz. This is the combined result of vertical beam width and shadow loss and is an extreme example not likely to be encountered in less rugged terrain.

Multipath Propagation Effects

Because of the limited elevation of the base station antenna site and the uneven terrain, the received signal (in both bands) in nearly all locations is the vector sum of a large number of reflected wave fronts of differing path lengths. As the vehicle travels through the composite field the resultant amplitude at the receiver varies cyclically at a rate related to the wavelength of the signal and the angle of motion of the vehicle relative to the field.

This results in the well-known "picket fence" interference effect. Fig. 6 shows the signal strength variations in both bands when the truck was driven at slow speeds alongside the RCA plant at Meadow Lands. The variation in both cases ranges from 20 to 30 dB in amplitude, with the frequency of variation of the 862-MHz signal being approximately twice that at 454.55 MHz.

At 30 miles (48 km) per hour the frequency of the fade rate is approximately 44 times a second at 454.55 MHz and 88 times a second at 862 MHz. The deep fade duration is only a small fraction of the fade cycle, and the average signal strength is only slightly lower than the peak level.

When the average signal strength was 1μV (-107 dBm) or greater, the "picket fence" interference effect was almost negligible.

With an average signal of 0.25μV (-107 dBm) the interference was at an annoying level but had little effect on intelligibility.

As the signal feel below 0.25 μV there was a rapid degradation in intelligibility due to the increased lengths of the bursts of receiver noise.

The data signalling waveform consists of a 1200-Hz burst of tone. Data is encoded by phase-shift modulation of the tone, as shown in Fig. 7.

In both bands it was found that correct data messages were consistently received if the average signal strength was 1 μV (-107 dBm) or greater. Further tests and analyses are under way, and a supplementary report is in preparation.

Signal Strength Prediction

Fig. 8 is an elevation profile of the 19-mile (30.4-km) path from the base station to the Meadow Lands plant.

The table below compares Bullington and Okumura predictions with measured median signal strength over the path.

Frequency	Predicted		Measured
	Bullington Method	Okumura Method	
454.55 MHz	1.6 μV (-103 dBm)	1.9 μV (-101.5 dBm)	3μV (- 97.5 dBm)
862 MHz	1.1 μV (-106 dBm)	1.5 μV (-103.5 dBm)	1μV (-107 dBm)

The 11-mile path from the base station to Hammarville alongside the Allegheny River is even rougher. Dropping abruptly from the base station to about 700 feet, it then climbs irregularly to another peak at 1150 feet in about 5 miles, drops again to 700 and comes back up to 1150 feet in the next 2½ miles, a third drop to 850 and a final highest peak at 1200 feet almost at the receiving position 500 feet lower.

Frequency	Predicted		Measured
	Bullington Method	Okumura Method	
454.55 MHz	4.5 μV (-94 dBm)	2.7 μV (- 98.4 dBm)	5 μV (-93 dBm)
862 MHz	3.2 μV (-97 dBm)	2.1 μV (-100.6 dBm)	3 μV (97.5 dBm)

In both locations reasonable agreement with the prediction methods is demonstrated.

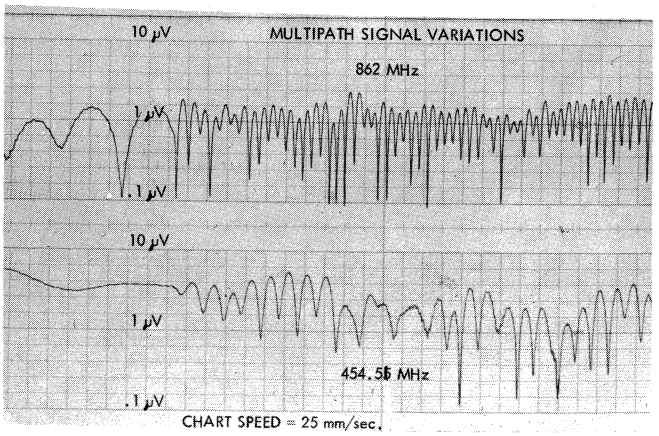


Fig. 6. The "picket-fence" signal variations.

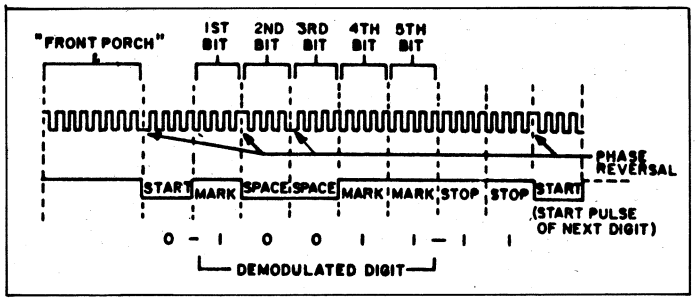


Fig. 7. Message format of the test data.

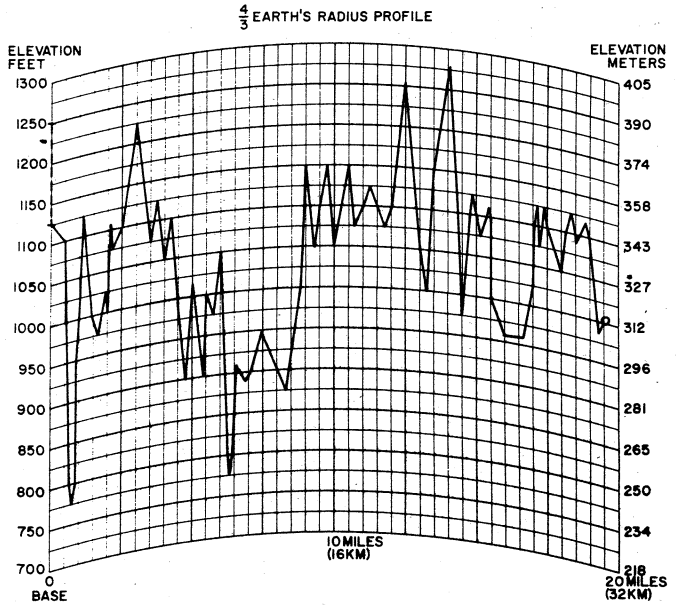


Fig. 8. Elevation profile, Pittsburgh — Meadow Lands.

Area Signal Coverage

The two belt measurement runs shown in Fig. 1 traversed the full gamut of terrain features characteristic of the Pittsburgh area and it is assumed that a signal quality analysis of these belts will provide a conservative estimate of the signal variation pattern to be expected in the area enclosed within the belts.

The analysis method consisted of dividing the belts into four equal quadrants, and in turn dividing the quadrants into approximately 50 equal intervals. The minimum average signal strength in each interval was classified as belonging in one of three categories:

Good	greater than	1.0 μV (-107 dBm)
Usable	between 0.25 μV and 1.0 μV	
Not usable	less than	0.25 μV (-119 dBm)

Table I shows the results of this analysis.

The south-east quadrant has much steeper sided valleys than the rest of the area and has resulted in worse coverage in both bands; the Inner Belt (B2) which travelled over the narrowest valleys of all being rather worse than the Outer Belt (B1). The shadowing effect depends on rate of change of elevation rather than the absolute changes involved. The latter changes are in fact fairly uniform over the whole area.

OUTER BELT (B1)

	PERCENT OF QUADRANT READINGS								PERCENT OF BELT READINGS	
	N.E.		S.E.		S.W.		N.W.			
	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz
Good	73	54	83	52	Measurements		80	55	79	54
Usable	21	30	15	42	not		18	32	18	35
Not Usable	6	16	2	6	completed		2	13	3	11

INNER BELT (B2)

	PERCENT OF QUADRANT READINGS								PERCENT OF BELT READINGS	
	N.E.		S.E.		S.W.		N.W.			
	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz	450 MHz	862 MHz
Good	94	58	70	46	Measurements		100	85	85	62
Usable	6	42	28	43	not		0	15	14	34
Not Usable	0	0	2	10	completed		0	0	1	4

Table I. **Base to mobile measurements.**

Mobile To Base Predictions

Predictions of the 862-MHz coverage to be expected on the inner belt (B2) using mobile transmitter powers of 10 watts (48 dBm) and 33 watts (45 dBm) are given in Table II. The classification of signal quality was revised for reductions in signal strength of 10 dB and 5 dB respectively.

Reducing the power level from 100 watts (50 dBm) to 33 watts has changed coverage (good and usable signals) from 96 % to 90%; a further reduction to 10 watts (40 dBm) results in a drop to only 63% coverage.

For reasonable mobile-to-base coverage a minimum mobile power of 30 watts (44.5 dBm) would be desirable for systems in this type of terrain.

Tunnel Propagation

There are three major highway tunnels in Pittsburgh: Fort Pitt, 1200 yards (1097 m) long, 400 feet (125 m) from (underneath) the base station; Liberty, 2000 yards (1829 M) long and 1.4 miles away; and Squirrel Hill, 1370 yards (1253 m) long, 5.5 miles from the base station. Minimum signal strength in Fort Pitt was 0.5 μV (-113 dBm) at 450 MHz and 1.0 μV (-107 dBm) at 862 MHz. In Liberty the figures were 0.8 μV (-109 dBm) at 450 and 0.5 μV (-113 dBm) at 862 MHz. In Squirrel Hill tunnel the minimum 450-MHz signal was 0.3 μV (-117.5 dBm) and the minimum 900-MHz signal 1.5 μV (9-103 dBm).

There was a solid usable 862-MHz signal throughout the length of these three quite differently located tunnel systems. The 450-MHz signal was as much as 15 dB lower than the one at 862 MHz, By rapidly changing the 150-MHz control signalling functions, loss of communication was shown within 500 to 1000 feet (156-312 m) of entering and leaving the Fort Pitt tunnels.

The remarkable improvement in tunnel propagation at 862 MHz is attributed to a more highly scattered signal illumination at the tunnel entrance and multiple reflections along the tunnel walls.

Wind Effects

On still days when parked at the Meadow Lands plant in an area with no other traffic movement the received signal strength on both channels showed little variation over a period of several minutes.

On days with high gusty winds in excess of 20 miles per hour, a $\pm$3 dB variation at 862 MHz and $\pm$1 dB variation at 450 MHz was observed at roughly half a second cyclic rate. Base station or mobile antenna motion under these conditions does not appear to be great enough to account for the magnitude of the signal variation. The phenomenon may be due to patterns of foilage movement with wind gusts.

10 WATT (40 dbm) MOBILE AT 862 MHz – INNER BELT (B2)

	Percent of Quadrant Readings				Percent of Belt Readings
	N.E.	S.E.	S.W.	N.W.	
Good	29	8	Measure-	47	25
Usable	29	42	ments not	38	38
Not Usable	42	50	complete	15	37

33 WATT (45 dbm) MOBILE AT 862 MHz – INNER BELT (B2)

	Percent of Quadrant Readings				Percent of Belt Readings
	N.E.	S.E.	S.W.	N.W.	
Good	42	12	Measure-	0	34
Usable	48	70	ments not	42	56
Not Usable	10	18	complete	58	10

Table II. **Mobile to base**

Interference

During hundreds of miles of measurements, degradation of audio output in weak signal areas due to ignition interference from either our own or other vehicles could not be positively identified on either the 862 or the 450 MHz band. This is due to the fact that when in motion the multipath fade effects closely resemble impulse noise.

To obtain a better quantitative picture the test van was parked in a busy downtown street for an hour. The RF inputs to the receivers were initially terminated in 50 ohms, with signal generator inputs provided by a high-attenuation T coupler. The signal generators were adjusted to provide a 10-dB quieting input corresponding to approximately 0.15 μV (-125.5 dBm) quieting signal. The antennas were then substituted for the 50-ohm load and degradation in quieting observed as various vehicles drove by.

Significant quieting degradation at 450 MHz was observed with some vehicles (particularly certain motorcycles). This degradation typically reduced quieting to 8 dB. At 862 MHz, although no measurable effects were observed on a Ballantine meter, some mild audible clicks were observed.

Observation of the noise spectrum appearing on a spectrum analyzer connected in turn to both 450-MHz and 862-MHz antennas confirmed that vehicle interference frequency components could be identified up to approximately 600 MHz but not above.

Conclusions

Our preliminary measurements have confirmed findings of previous investigators that:

1. 900-MHz city-wide mobile dispatch systems will be practicable in the near future, notably in level areas but also in more undulating terrain such as Pittsburgh's.
2. The propagation effects of changes in elevation due to either natural or man-made obstruction will closely follow those already experienced in 450-MHz systems, with approximately 8 dB increased propagation loss.
3. 900-MHz multipath effects on both voice and data communication will also be comparable to those in the 450-MHz band.

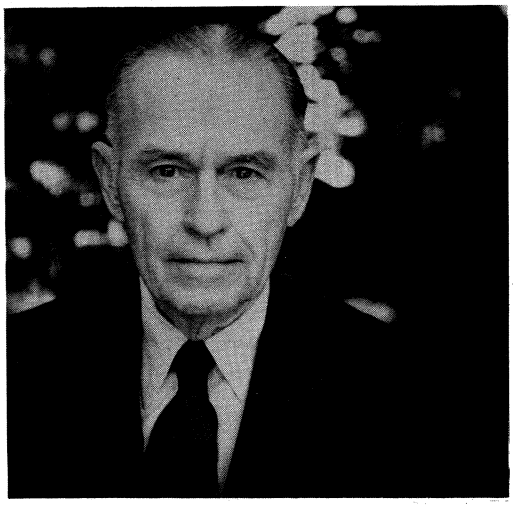
In addition, it appears that the 900-MHz band may offer some significant advantages over the lower band in such areas a long tunnels and under elevated roads and railroads.

Another marked improvement in coverage in the heavily noise-polluted downtown areas should result from the uniquely low noise levels generated in this band.

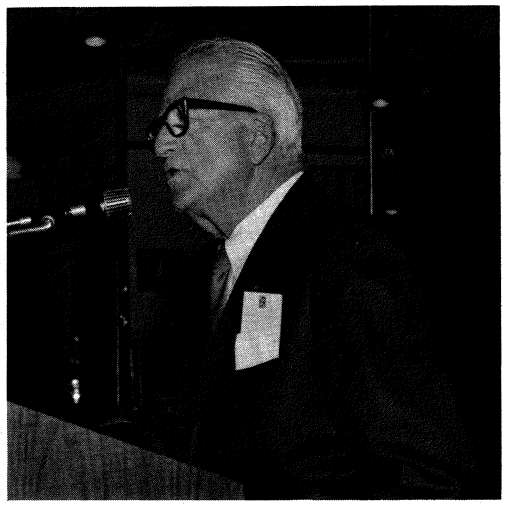
Owing to the wide range of propagation losses in terrain similar to Pittsburgh, the channel reuse pattern in cellular systems will require extreme care in design to avoid intolerable interference between cells sharing common channels.

Looking ahead to the hardware requirements for the new band, recent component technology developments have made practicable the design of mobile and base stations comparable in performance to existing 450-MHz equipment.

This Year's Awards Go To:



DR. LEWIS M. HULL



JACK R. POPPELE

Dr. Lewis Hull, of Boonton, NJ, was selected to receive the Armstrong Award this year. Dr. Hull's early background includes an amateur interest in radio dating back to 1911 and professional experience with the Signal Corps in World War I.

Organizer of the Radio Frequency Laboratories in 1922, he has been responsible for a number of important innovations and advances in radio and instrumentation, including single control for radio receivers, automatic volume and noise control, early signal generator, and Q-meter.

Dr. Hull and his staff made what were possibly even greater contributions to aircraft radio, including antennas, interference shielding and complete command sets. Practically every combat plane in the early part of World War II was equipped with one of Dr. Hull's radios.

He was active in professional organizations and was president of the IRE in 1933.

The Armstrong medal has been given to only 19 persons since it was established in 1935. It was originated by the Board of Directors of the Club as an honor to Edwin Howard Armstrong, and an illuminated scroll announcing the establishment of the Award was given to him at the presentation of his paper, *Frequency Modulation*, December 19, 1935. In the words of the scroll, the Armstrong Medal is:

". . . to be bestowed by the Board of Directors of the Radio Club of America upon any person within its membership who shall have made, in the opinion of the Board of Directors, and within the spirit of the Club, an important contribution to Radio Art and Science."

In recent years a feeling arose that there should be some recognition of persons whose contributions were not confined to the technical field. It was pointed out that while no one doubted the overwhelming contribution that David Sarnoff, for instance, had made to the advancement of radio, he did not qualify under the terms of the Award.

Consequently a new award, "for significant contributions in electronic communications" was established in 1973, and given the name "David Sarnoff Citation." The first of these was given to Barry Goldwater, K7UGA and K3UIG, at the Annual Banquet November 16, 1973. This year the citation will be awarded to Jack R. Poppele.

It has recently been suggested that a new recognition, in the form of a Merit Citation, Certificate of Achievement or Honor Award, be awarded annually to a limited number of members for contributions to the industry. More on this in the President's Message.

This year's Sarnoff Citation recipient is Jack Poppele, more than 30 years a Fellow of the Club, and a Director for the past several years. Jack is also president of the Veteran Wireless Operators Association and of the de Forest Pioneers.

He received his radiotelegraph license in 1915 and operated at sea for a number of years. A pioneer in radio broadcasting, he was one of the two engineers who built WOR, one of the earliest broadcast stations. He was Chief Engineer of the station from 1922 to 1952, becoming a vice president of the station and later a director of the Mutual Broadcasting System. WOR was also one of the first stations to use a directional antenna, which he designed.

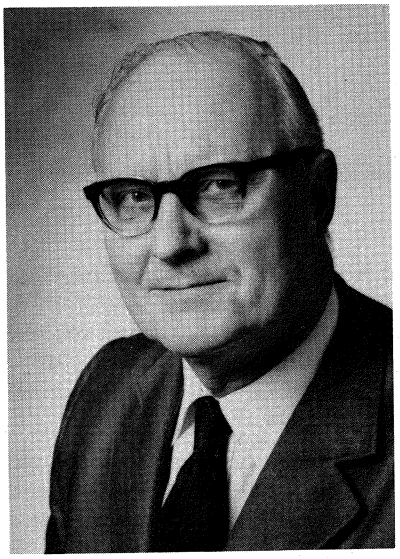
In 1927, when scientists were speculating on the possibility of life on Mars, Poppele and engineers at WOR transmitted radio pulses in the direction of that planet, to invite response if it should contain an advanced form of life.

An early proponent of FM, he was a founder and was the first president of the FM Broadcasting Association. Later he was a founder and served seven years as president of the Television Broadcasters Association, participating in drafting the engineering rules and channel allocations that are the basis for today's TV broadcasting. In 1954 he was appointed Director of the Voice of America. Last, he is the man who is responsible for the success of our last several Annual Meetings and Banquets.

The Annual Meeting is November 15 at the Plaza Hotel

59th and Fifth, New York City
Cocktails 5:30 — Dinner 7:00

Guest of Honor



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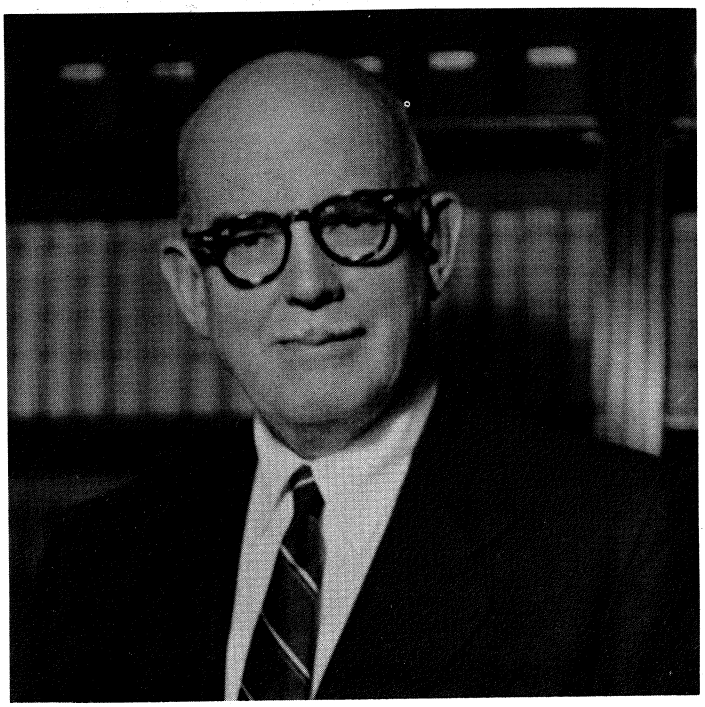

DR. GEORGE W. BAILEY

Dr. George W. Bailey is possibly best known as an amateur — the world's leading "ham." His stations W1KH and W2KH were known the world over. In 1933, he installed a radiotelephone in his automobile, and in 1935 was the first amateur to be heard in Europe on the 5-meter band. For twelve years (1930-1941) he was the liaison station with the Grenfel Mission in Labrador; its only contact for six months of the year. He was also the first amateur to contact all states on-single sideband. From 1940 to 1952 he was the President of the American Radio Relay League (ARRL) and the International Amateur Radio Union (IARU) thus being effectively the head of all the world's amateurs.

In 1941 he was called to Washington by the National Research Council, serving and its Chairman of the Research Section, Office of Scientific Personnel until 1943. From 1944 through 1946 he was Chief of the Scientific Personnel Office of the Office of Scientific Research and Development, under Dr. Vannevar Bush. At the same time he acted as chairman or member of a number of other defense-oriented committees and agencies. For his wartime work he was awarded the Certificate of Merit by President Truman.

In 1945, Dr. Bailey was appointed Executive Secretary of the Institute of Radio Engineers (IRE) serving until it became the Institute of Electrical and Electronic Engineers (IEEE) in 1963. He then became the Institute's Executive Consultant until his retirement from the IEEE in 1966.

In addition, Dr. Bailey is an honorary life member of the Veteran Wireless Operators Association and of the Quarter Century Wireless Association, a Fellow of the IEEE, Fellow of the Club since 1948, a director of the Braille Technical Press, member of the Broadcast Pioneers and member emeritus of the New York Academy of Sciences, as well as a number of other associations, and is the holder of numerous citations and awards.

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Some Views on Deregulation
of the Safety and Special Radio Services

by Charles A. Higginbotham
Fellow, Radio Club of America

Chief, Safety and Special Radio Services Bureau, Federal Communications Commission

This paper was prepared by Mr. Higginbotham for delivery at the joint Club-AFCEA-ARRL-QCWA luncheon March 26. He planned to deliver the paper himself, but was prevented at the last moment. It was therefore presented by Richard Everett, Assistant Chief of the Bureau.

It is a pleasure to be with you today and discuss the Safety and Special Radio Services, including possibilities of de-regulation. As most of you know, the Safety and Special Radio Services bureau is made up five divisions, charged with regulatory and licensing responsibility for Amateur Radio, Citizens Band, Private Land Mobile (Public Safety, industrial and land transportation), Aviation Radio and Marine Radio, as well as one division devoted almost entirely to enforcement.

The safety and special services have been experiencing unprecedented growth during the last decade and we have been hard pressed to maintain reasonable application processing speeds. In fact, in our efforts to handle the application workload, *our rule-making activities have been neglected to some extent* and our rules, many of which were structured and organized many years ago, *have not kept abreast of the state of the radio art.* Further, we have been working under an ever-growing and seemingly endless enforcement workload that further reduces the amount of manpower we can devote to the development of licensing and regulatory structures that are in pace with the times. It has been charged that our regulatory practices actually discourage new and innovative use of radio and I believe that there is support for this statement.

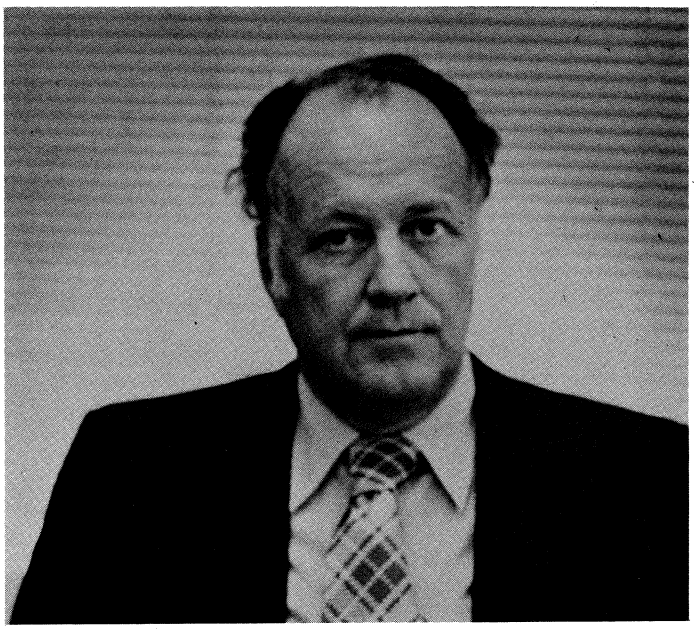
Our application load continues to grow and we are examining our procedures to determine if steps can be taken to improve them, and thus improve our service to our licensees and prospective licensees. We are looking at our forms and the supplemental application filings required by our rules and have commenced an in-house management study to look at our application processing procedures. While we are interested in eliminating and revising requirements, we will not continue long-standing practices of eliminating information solely to shorten application procedures if such action would reduce our ability to provide essential data for these services. In fact, we would anticipate that, based on our experimental spectrum management operation in Chicago, a useful and readily available land mobile data base will assist industry and the commission in more effectively utilizing the radio spectrum. *But where it appears data are no longer required to support application filings, we will take action such as our recent rule changes relating to applications for amateur repeater stations.*

But applications are just one area of our de-regulation efforts and, while we will continue to examine our procedures to ensure that they are reasonable, we are also looking at our rules to keep them current and to ensure that new and more effective uses of radio are encouraged.

Some Probable Revisions

Now to cover some specific areas that I believe will be of interest to most of you.

In the amateur area, we are moving ahead with some further revision of our repeater rules. The first of probably several proposed rule changes concerning repeaters will look at revision of the control operator rule. We believe that many of the problems of misuse that led to these requirements are disappearing and this may lead to some relaxation in our requirements. In any event, I would expect action by the Commission at an early date. (Docket 20112).



Our rule revisions that would reduce the code requirements for amateur licenses in the upper VHF frequencies are almost complete and you should be looking at our proposals very soon, along with some changes in our license structure that we hope will encourage the growth of amateur radio.

I would point out that we will be asking for your comments and suggestions. As these proceedings progress, we will be looking at other rule requirements, such as log keeping and station identification, easier procedures for special event call signs, exploration of possibilities for the assignment of counterpart calls (subject, of course, to availability) and exploration of possibilities for lifetime licenses for extra class.

Possibilities in the Citizens Band

In the citizens radio area, we will continue to expand our enforcement activity but, at the same time, will be looking at possible changes in our rules with a view towards elimination or modification in areas where we find they are too restrictive. This is not to say that we will eliminate rules simply because we have enforcement problems, but we will examine our rules to determine that they are needed. Where the rules appear to serve no useful purpose, they will be revised.

We have been hard at work on a *point-of-sale licensing system* for citizens radio and we are optimistic that this can be worked out satisfactorily. We believe it would largely eliminate unlicensed operation and would permit new users to operate immediately. In this same vein, we would also like to implement a system that would permit new amateurs to begin operation as soon as they pass their Commission-supervised examination. Citizens radio will receive attention in other areas. We know the service is congested: more than 850,000 licensed users for 23 channels. We will attempt to decide the Class-E RULE MAKING EXPEDITIOUSLY BUT THERE ARE PROBLEMS THAT MUST BE RESOLVED.

In the land-mobile area, the so-called PSIT services, we have underway a project of consolidation of parts 89, 91 and 93. This will complete an effort that commenced with our proposed part 94, private microwave rules for all the safety and special radio services. The goal here will be simplification and elimination of unneeded rules but we will not be combining services. In other words, the Police, Fire, Power, Railroad and all the other land mobile services would be continued, but in a single rule part. We think there is merit to having only two rule parts for the private land mobile and point-to-point microwave services.

Communications at Sea

One area under the jurisdiction of our Bureau, where we believe significant and encouraging progress has been made — and is being made — is that of improving radio communications in the Maritime Mobile service.

It has long been our objective to move most short-range (about 25 miles) communications between ships and between ships and coast stations to the VHF Maritime Band (156-162 MHz) where the channels are more plentiful and where the superior frequency modulation (FM) signal is used.

These efforts have been accelerated since the Maritime World Administrative Radio Conference in Geneva in 1967. We have made numerous rule changes to implement the agreements made at that conference and to terminate the use of the medium and high frequencies for short distance maritime radio communications. At the same time, we have provided for the change-over in the long-range communications from double sideband to single sideband.

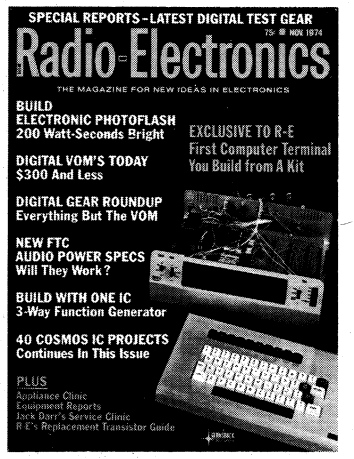
With respect to ship stations, we are now in a transitional period during which vessels are changing over to VHF. Generally, MF and HF double sideband equipment has not been authorized in new installations since January 1, 1972, and must be discontinued entirely by U.S. stations by 1977. The numbers of VHF vessels, particularly recreational boats, is growing by leaps and bounds.

For communicating with points on shore by ships, we have in the past 3 to 5 years authorized more public coast VHF stations by several times, than in all of our prior years of regulatory activity. Today, practically every boating community in U.S. waters has a VHF public correspondence radio service.

We are now studying proposals and preparing others for the improvement of the long range maritime service. The advent of a maritime satellite service of very limited scope by the end of 1974 is expected. We are continuing discussions in the international arena for the establishment of more complete maritime satellite communications. We are anticipating the promulgation of new rules that will limit the numbers of public coast radiotelegraph stations and at the same time define a more rigorous set of technical and operational specifications under which the service will operate. A prototype automatic, direct dialing VHF radiotelephone service on the Great Lakes has been authorized and will see service this year. We are studying a proposal for a unique radiotelephone system for the Mississippi River system. These systems will also provide for the introduction of printer and facsimile in the marine service.

In conclusion, I would summarize by saying that our objectives in de-regulation will be to eliminate, simplify, clarify and consolidate rules and procedures. We will review each rule and determine whether it is necessary. We will attempt to structure our rules in a straightforward and understandable manner and where it appears feasible we will consolidate and restructure.

Thank you.



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Vivian A. Carr Is Membership Chairman

Our new Membership Committee Chairman, Vivian Carr, was also the first woman member of the Club [November 1973]. [Although the Club's Constitution stated for many years "A member shall be a male or female person not less than 17 years of age . . ." the organization apparently remained all-male from the beginning.] Ms. Carr was also the first woman to become a member of the Engineers Club of New York, and the first female member of its Board of Directors. She is also a member of the IEEE, and vice chairman of its New York Section.

Now Supervisor of Corporate Planning — AT&T Executive Department — Corporate Planning Division, Ms. Carr received her engineering training at Stevens Institute of Technology and Iowa State University. She worked with Bell Labs until 1954, and with AT&T since. Much of her work has been in switching, and more recently in publications and planning. She was editor of *Time Sharing Minutes and Systems Planning Newsletter,* **and has prepared numbers of in-company documents and training course materials.**

CORRECTION

In the article "First Transatlantic Message on 200 Meters," **[Proceedings,** March, 1974, page 3), station 2ARY, of Brooklyn, was incorrectly listed as 1ARY. The situation was further confused by the face that 1ARY was also heard on the tests.

This error is attested to by our new member, Dave Warshaw, who was operating 2ARY at the time and is therefore in full possession of the facts!

Citations to New Fellows

Hugh S. Allen, Jr. *Vice President, Sales, Gotham Audio Corp., 1710 La Brea Avenue, Hollywood, CA, 90046.*

For his many years association with radio and electronics and his contributions to the audio industry.

S. S. Ashton, Jr. *Official LEAA, Systems Development Div., US Dept. of Justice, 1100 Vermont, Wash. DC 31231.*

For contributions to military communications in 20 years with the Signal Corps, and later leadership in the Law Enforcement Assistance program.

Henri Busignies *Senior V.P. and Chief Scientist, ITT. 320 Park Avenue, New York, N.Y. 10022.*

For substantial contributions, domestic and international, to the radio, communications and radio navigation fields.

Norman L. Chalfin *Patent Attorney, JPL, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91103.*

Contributor of numerous electronic publications for over 40 years.

Arnold B. Covey *Retired. 5 Heights Road, Ridgewood, N.J. 07450.*

Contributions in the field of telephony, communications and video facilities.

Harry J. Dannals *President ARRL. 16 Arbor Lane, Dix Hills, New York, NY 11746.*

Contributions to the radio and communications field through leadership in Amateur Radio.

Donald deNeuf *Retired, former President of Press Wireless, 602-B Heritage Village, Southbury, CN 06448.*

Leadership in communications over the past 50 years.

Frank Grimm *Technical Director, Pye Communications Ltd. Newmarket Road, Cambridge, England CB5 8PD.*

Contributions in research, design and application of radio and electronics.

Thomas F. Jones *President, University of South Carolina [on leave].*

Contributions in the fields of communication and education, and personal achievement in competitive life.

Sam Lane *Deputy Communications Director, Los Angeles Co. 4015 Ramitas Road, Santa Barbara, CA 93110.*

Contributions in land mobile radio, and industry leadership through IEEE/VTG.

Leland Larsen *President, Larsen Antennas, Box 1686, Vancouver, WA 98663.*

Contributions in the field of communications, and specifically in that of antenna design and production.

Nils Lindenblad *44 Shady Brook Lane, Princeton, NJ 08540.*

Numerous inventions and developments in the radio and electronics fields.

James McLeod *VP Page Communications Engineers, Vienna, VA 22180*

Contributions to the art of long-range communications.

Dearl Morrison *252 Cambridge Drive, Mt. Clemens, MI 48043.*

Extensive activity in public safety communications.

John Neubauer *Consultant, 1013 Lakeshore Drive, Collingswood, NJ 08108.*

Contributions in the development and implementation of military and civilian communications, and work with IEEE/VTG.

Clarence Pfeifer *53 Warren St., NY 10007.*

Pioneering work in wireless communications dating back to 1908, and dedicated interest in radio, both amateur and commercial.

Alvin Reiner *Division Chief, Microwave Group, FCC, Washington, DC 20554.*

Contributions to the field of communications through leadership and work in the FCC.

Joseph Rose, *4203 Sandhurst Court, Annandale, VA 22003.*

For design, supervisory and organizational work in communications, particularly in the field of special antennas.

Chan Rypinski *President, Rydax Corp., 76 Belvedere St. San Rafael, CA 94901.*

In recognition of his inventive contributions in the field of digital communications.

Gerald F. J. Tyne *40 Kline Place, Berkeley Heights, NJ 07922.*

Contributions to the history of radio, and especially of the vacuum tube and its place in communications.

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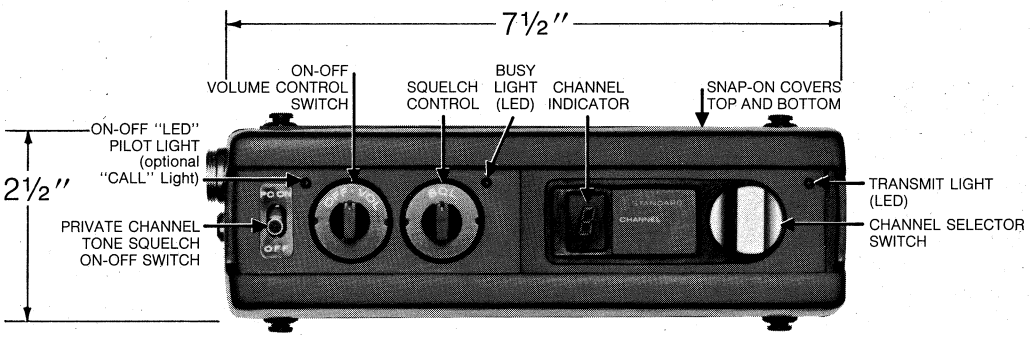
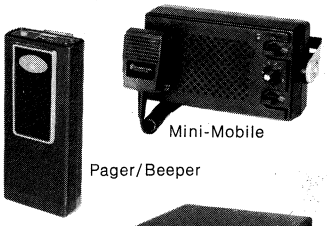
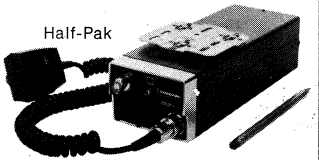
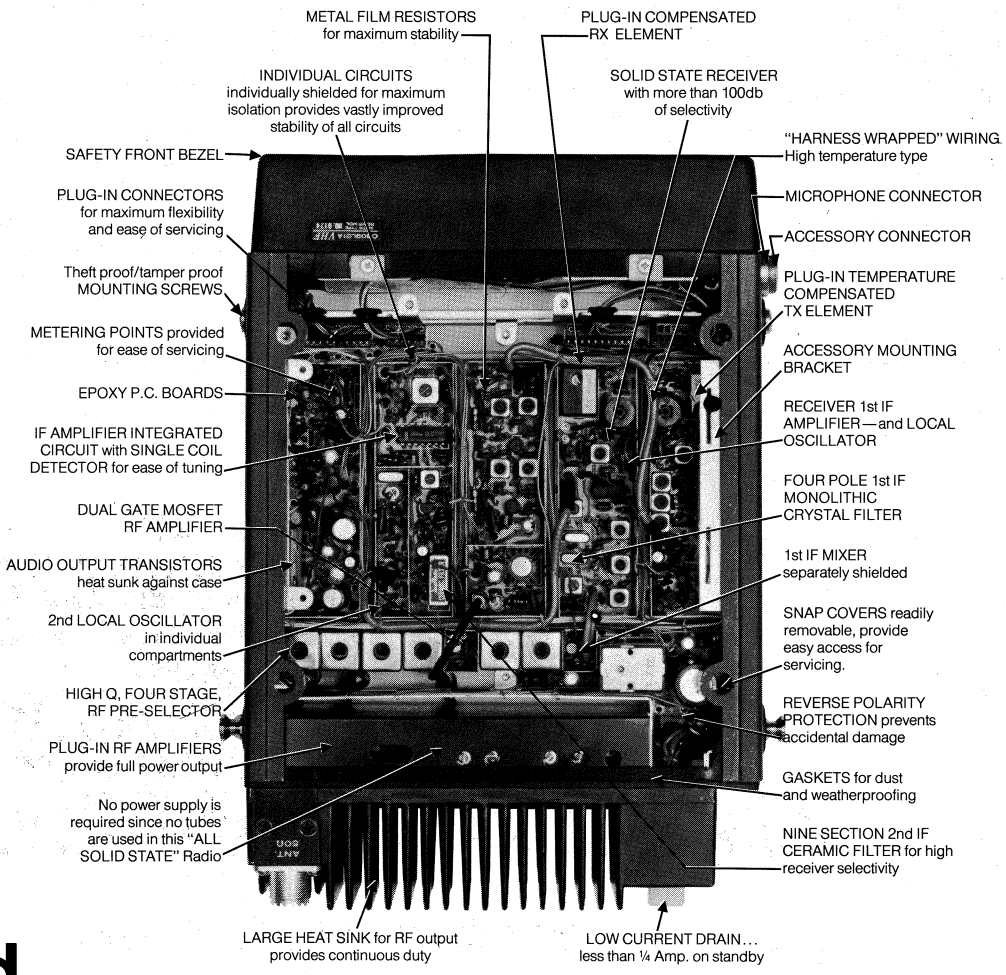


The 809/859 Base Mobile Transceiver







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Tesla Honored In Own Country

Nikoa Tesla, one of the most important figures in the development of today's electronic age, is also one of the least known. Now his countrymen are moving to rectify that situation.

The man who established the alternating current electrical system on which our civilization is based has long been a victim of neglect. A few devoted disciples have formed Tesla societies to keep his memory alive, and journalists have written articles about the great genius, only to find that they arouse hardly a spark of interest in a generation that cannot believe the story of his accomplishments (or else why wouldn't they have heard of them in their engineering classes?).

Now, in Beograd, the capital city of his native Yugoslavia, a film of Tesla's life is planned. It is to be completed in 1976, the 120th anniversary of Tesla's birth. Much of the movie will be filmed in New York, where he worked most of his life. Beograd has had a Tesla Museum since 1955. Here his ashes are preserved and some of his laboratories have been reproduced. Last spring a scientific film festival was held in his honor, with entries on such subjects as lasers, solar technology energy, pollution and oceanography, from France, Poland, the Soviet Union and the United States.

One of the most recent and effective presentations of Tesla's life and works was the six-page story "Tesla — World's Greatest Engineer," by E.J. Quinby, which was the main article in the Fall, 1971, issue of the *Proceedings*. Drawing from his early boyhood memory of seeing Tesla's demonstration of radio control of model vessels (given at Madison Square Garden *75 years ago*] his conversations with Hugo Gernsback — possibly Tesla's last friend — and wide reading, he presented Tesla's life sympathetically and in complete detail.

More recently, a western Tesla enthusiast, Nick Basura of 3414 Alice St., Los Angeles, CA 90065, has assembled a collection of available reprints of articles on Tesla, which he is offering for $5.00 postpaid to all persons interested in the "World's Greatest Engineer."

Stuart Meyer to Chair 1975 ARRL Convention

The Board of Directors of the American Radio Relay League has approved the request of the Northern Virginia Amateur Radio Council (NOVARC) to sponsor the 1975 ARRL National Convention.

This convention will be held over the week end of September 12, 13 & 14, 1975 at the Sheraton Inn & International Conference Center located in Reston, Virginia. Reston is located near Dulles International Airport and the convention site features plenty of free parking in a suburban location close to Washington, D.C.

For further details, contact; Stuart Meyer, W2GHK/4, General Chairman, 1975 ARRL National Convention, 2417 Newton Street, Vienna, Virginia, 22180. Phone (703) 281-3806.

New England Museum Holds 10th Anniversary Meeting

A talk, "The History of the Armstrong FM Patent," by Dana M. Raymond, formerly attorney for Mrs. Armstrong, highlighted the 10th Anniversary Meet of the New England Wireless and Steam Museum September 7. It was followed by Bruce Kelley's impressive show, "An American Inventor," Edwin Howard Armstrong.

The museum, at East Greenwich, Rhode Island, has been directed by our Fellow member Robert W. Merriam and his wife since its inception in 1964.

The evening discussion closed an all-day program that included a morning equipment sale of items donated to the museum to raise funds for the library, an ancient equipment contest and a number of demonstrations, talks and quizzes.

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500 CYCLE TONE FROM 60 CYCLE TRANSMITTER
— How We Did It Back In 1913 —

by E. J. QUINBY

Early in the history of radio we appreciated the superior readability of the dots and dashes from the new 500-cycle spark transmitters. But such equipment was beyond the reach of most amateurs. We struggled along with our 60-cycle equipment. The introduction of the rotary spark gap was helpful, raising the pitch from a deep growl to a low-pitched hum. There seemed to be a practical limit above which we could not raise the speed of the motor driving our non-synchronous rotary spark gap.

Then came the inspiration to design this device so that the frequency of its discharges could be raised without increasing the speed of rotation. This was done by employing the principle of *precession.* With a rotor having a small EVEN number of electrodes revolving in a stator having a larger ODD number of electrodes, the spark discharges occurred in swifter sequence, racing around the device many times faster than the actual speed of its physical rotation. Thus, with a rotor having four sets of electrodes and a stator having eleven sets, 44 discharges per revolution were possible, all spaced 98 degrees about the stator. Using a 60-cycle motor driving the rotor at 1370 rpm, a 500-cycle tone was produced. This was all explained in Hugo Gernsback's pioneer radio magazine *Modern Electrics* in 1913.

The sequence of discharges was, as the four armature arms turned:

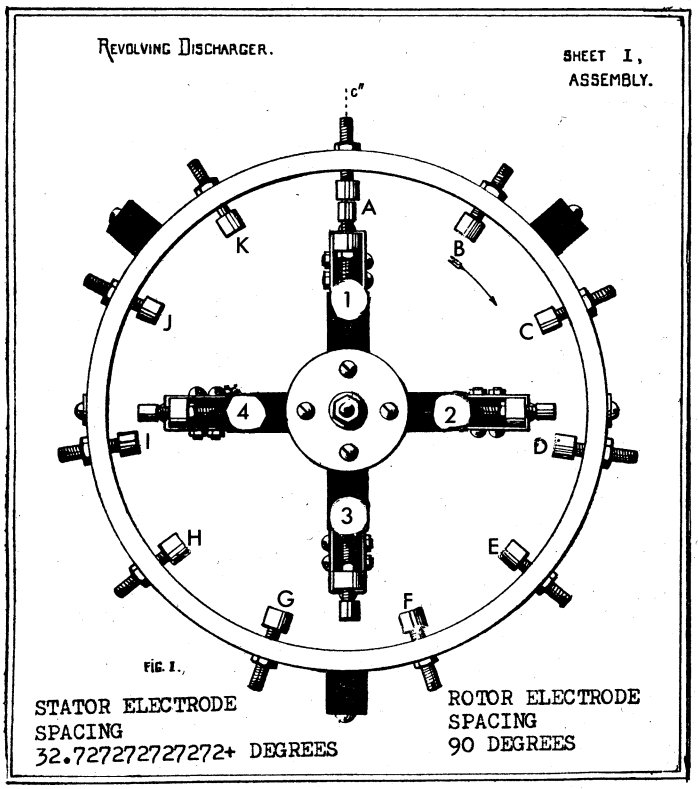
1-A, 2-D, 3-G, 4-J; 1-B, 2-E, 3-H, 4-K; 1-C, 2-F, 3-I, 4-A; 1-D, 2-G, 3-J, 4-B; 1-E, 2-H, 3-K, 4-C; 1-F, 2-I, 3-A, 4-D; 1-G, 2-J, 3-B, 4-E; 1-H, 2-K, 3-C, 4-F; 1-I, 2-A, 3-D, 4-G; 1-J, 2-B, 3-E, 4-H; 1-K, 2-C, 3-F, 4-I. Total 44.

The spacing of the electrodes on the stator (see below) and on the rotor (90 degrees) was carefully indicated on the original drawings.

Today, scanning the construction drawings accompanying that piece, I am amused at the youthful author's unsuccessful struggle with the problem of dividing a circle into eleven equal parts, which seems to have left him slightly confused. Today he would dodge the issue by simply specifying eleven equal divisions, leaving the reader to discover that the electrodes on the stator should be spaced 32.72727272 + degrees! The diminutive remainder could then be disposed of in the nearest waste-basket!

Construction of the Revolving Discharger of the Non-Synchronous Type

By E. Jay Quinby



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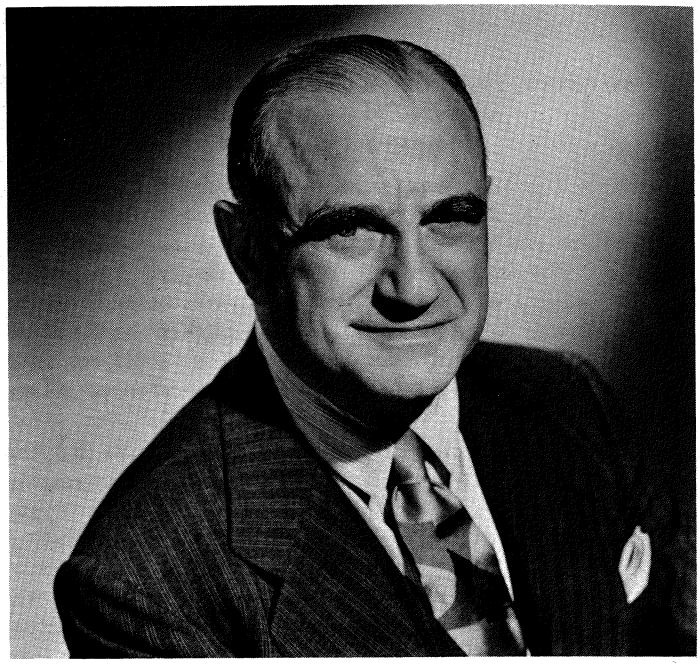
NOTED FIGURES PASS ON

Dr. Alfred N. Goldsmith died in St. Petersburg, FL, on July 1. A member of the Club from 1915, and an Honorary Member from 1922, he was one of the great figures on the century in electronics, with pioneering inventions in radio, television, medical electronics and sound motion pictures.

Dr. Goldsmith received his B.S. City College of New York in 1907, starting immediately as an instructor there. In 1915 he became a consulting engineer for General Electric Co., and in 1917 director of research for Marconi. When Marconi merged with RCA in 1919, he continued as Director of Research, and at the time of his death was Senior Technical Advisor and Honorary Vice President of RCA.

Possibly Goldsmith's most famous patent is that on the shadow-mask television tube, but his earlier work in radio was just as important at the time. He was a co-founder, director and life member of the IRE (and incidentally was the last surviving founder.) He was IRE president in 1928, and was Editor Emeritus and Director from 1912. He was a Fellow of the AIEE till its merger with the IRE, and became a Fellow, Editor Emeritus and Director of the IEEE. In all, he was Fellow of a half dozen societies (including the International College of Surgeons) and Honorary Member of as many more.



ALFRED N. GOLDSMITH

Murray Crosby, another great figure in communications, member from 1939 and Fellow from 1940, died June 8. An amateur from the early days (9AOX and W2CSY), he worked at communications research in the RCA Labs from 1927 to 1944, then after a brief period with Paul Godley, founded his own laboratory. His multiplex stereo system was considered by most audio experts to be superior to the one adopted by the FCC. He held over 200 patents.

Edward A. Amerman (M 1938, F 1953) died July 31. An electronic design engineer, he was also a graduate of the U.S. Army Officers Communications School, and was active with the New Jersey National Guard as a communications advisor.

Leon Adelman (F 1950) died April 8. An active amateur since 1917, he received recently a special award as a licensed amateur for 50 years — W2AFS since 1923. He was radio editor of a number of early magazines, including *Science and Invention* and *The Experimenter*, and was technical editor of *Radio News*.

F. Summer Hall (M 1949, F 1957) was an audio engineer, with special experience in broadcast control-room and field engineering. He was a Fellow and Past President of the AES.

Thomas A. Regan (M 1970, F 1972) died August 10. Communications Officer for the Long Island State Parkway police, he held a degree in Law from St. John's University and Law School since 1940. He was a member of the State Police from 1932 to 1947, when he began with the Parkway Police.

Three Good Meetings

The Club has had three successful technical meetings during the year. The first, held in conjunction with the AFCEA, ARRL and QCWA, was a luncheon meeting at the Engineers Club in New York City March 26. A discussion by Charles Higginbotham, Chief, Safety and Special Radio Services Bureau, FCC, was delivered by Richard Everett, Assistant Chief, Amateur and Citizens Division, since Mr. Higginbotham was unable to be present. The paper appears in this issue. A Fellow Certificate, which was to have been presented to Mr. Higginbotham, was accepted by Mr. Everett in his behalf.

Automotive electronics was the subject of the next meeting, April 21. John Vergoz of ITT was the speaker, and also presented a striking film of ITT's new electronic anti-skid device.

On May 21, Stuart Meyer, a Director of the Club, presented the paper described on page 4 and succeeding pages. Mr. Meyer took part in the tests, but the actual writing of the paper was the work of two other RCA men, Frederick A. Barton and Gregory A. Wagner.

At the March 26 meeting. Left to right: Frank A. Gunther, Jack Poppele, David Talley, Fred M. Link, John A. Osterman and Nathaniel Pfeffer, 2AIM.

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ADDRESS CHANGES

These new addresses can be pasted directly over the listings in the 1973 Directory [1973 members on the listing on page 26 of the March issue].

Bailey, George (M 1948, F 1953, L 1970), c/o L.H. Montgomery, 131 Taggart Avenue, Nashville, TN 37205

Best, Lewis E. (M 1971), 1786 Cardel Way, San Jose, CA 95124

Bradshaw, Carl J. (M 1972, F 1973), Oak Industries, Inc. Crystal Lake, IL 60014.

Burton, Jan (M 1970), Motorola Comms & Electronics, Suite 201, 222 West Osborn Road, Phoenix, AZ 85013

Cote, Andre F. (M 1972), 1901 North Moore St., Suite 602, Arlington, VA 22209

Diehl, Wm. F. (M 1920, F 1926, L 1971), 6851 Roswell Rd. N.E. Apt. F-4, Atlanta, GA 30328

Crabb, Robert C. (M 1973), 4321 Clear Valley Drive, Encino, CA 91316

Cramer, Bruce D. (M 1955), P.O. Box 2542, Menlo Park, CA 94025

Dahlen, Phillip S. (1972), Rural Route 3, Elk River, MN 55330

Diamond, Nicholas (M 1973), 38 Old Stage Road, Chelmsford, MA 01824

Elliott, Max (M 1973), P.O. Box 55, Oak Run, CA 96069

Felch, Edwin P. (M 1939, F 1942) 109 Fairmount Ave., Chatham, NJ 07928

Gartsman, Harry S. (M 1970), 9921 Sunset Blvd., Beverly Hills, CA 90210

Grim, W. Manning (M 1926, F 1938, L 1971), c/o Minogue, Somers, NY 10589

Helms, Clegg (M 1971), Apt. 310, Forbes Bldg., 9 Forbes Place, Dunedin Beach, FL 33528

Kahn, Leonard R. (M 1953, F 1961), 74 North Main St., Freeport, NY 11520

Kaye, Robert K. (M 1972), 177 Worcester St., Suite 103, Wellesley, MA 02181

Kihchel, Oliver D. (M 1970), RD 2, Woodlawn, Jeannette, PA 15644

King, Patrick J. (M 1972), 6219 Lands End Lane, Indianapolis, IN 46220

Lundahl, Tore (M 1959), 5213 Elvira, Laguna Hills, CA 92653.

Lessig, Linwood G. (M 1971), 422 San Sebastian Prado, Altamonte Springs, FL 32701

Lynch, Arthur H. (M 1921, F 1929, L 1971), 152 Eagle Point, Punta Gorda, FL 33950

Miller, C.C. (M 1970, F 1972), 103 Dale Drive, San Jose, CA 95127

McKenzie, Alexander A. (M 1949, F 1953, L 1970), P.O. Box 38, Eaton Center, NH 03832

Palmer, Jack M. Sr. (M 1970), 830 E, Park Crestwood Drive, Crestwood, MO 63126

Prystup, Edward (M 1970), 1133 Old Bayshore Hwy., San Jose, CA 95112

Richter, Allen R (M 1969), Villa 139, 129 Lebane Terrace, North Palm Beach, FL 33408

Rietzke, Eugene H. (M 1969, F 1970), 7301 Georgetown Pike, McLean, VA 22101

Rivkin, David H. (M 1970), 473 Long Hill Short Hills, NJ 07078

Runyon, John B. (M 1935), 39 Locust Point Road, Locust, NJ 07760

Samuels, Ruel P. (M 1972), 42 Lords Road, Kingston 5, Jamaica, W.I.

Shand, William (M 1970), Atlantic Research Inc., 5390 Cherokee Ave., Alexandria VA 22314

Skipper, Lionel C. (M 1946, F 1973), Hofstra County Estates, 451 Fulton Ave., Hempstead, NY 11550

Stockton, Charles (M 1970), 555 West Middlefield Rd., Mountain View CA 94040

Stodola, E. King (M 1958, F 1964), 7816 Heritage Circle, Manlius, NY 13104

Swigart, James F. (M 1972), 7181 Grandoaks, Stanton, CA 90680

Thompson, John R. (M 1972), P.O. Box 132, Wexford Run Road, Bradford Woods, PA 15015

Wand, Hal F. (M 1969), 5131 North 40th St., Phoenix, AZ 85018

Walker, Robert E. (M 1971), 524 West Tharpe St., Tallahassee, FL 32303

Williams, Dorsey (M 1971, L 1972), 1631 S.W. 83rd Avenue, Miami FL 33155

VWOA Celebrates Its Golden Anniversary

On February 22, 1975, the Veteran Wireless Operators Association will celebrate its 50th Anniversary with a banquet and the giving of awards. Members of the Radio Club of America are invited to attend, as are all other old-timers in the communications field. The affair will be held at the

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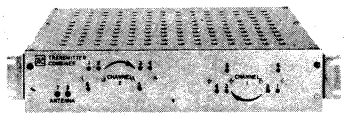

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NEW MEMBERS

Since the last supplement to the Directory was published in the March issue, 40 new members have joined the Club. This list updates the Directory to November 1, 1974.

Belenski, John (M 1974) Communications, Engineer (Supervisor) The Boeing Co., Army Systems Div. Seattle, WA. P.O. Box 8808, Seattle, WA 98188

Bloor, Robert E. (M 1974) Senior Engineer, Ohio Telephone Co., Cleveland, OH. 24338 Smith Avenue, Westlake, OH 44145

Bryant, John A. (M 1974) Manager, Communications Evaluation, Texas Gas Transmission Corp., Owensboro, KY. 1542 Linden Avenue, Owensboro, KY 42301

Burgess, Edward S. (M 1974) Radio Systems Design, Sales and Service. 101 Morse Avenue, Rutherford, NJ 07070

Busignies, Henri G. (M 1974, F 1974) Chief Scientist and Senior Vice President ITT, New York, NY. 71 Melrose Place, Montclair, NJ 07042

Cassidy, Hugh (M 1974) Sectional Center Manager, US Postal Service, San Rafael, CA. Publisher, West Coast DX Bulletin. 77 Coleman Drive, San Rafael CA 94901

Chupp, James W. (M 1974) Chief Communications Technician, Suffolk County Police Dept., Hauppauge, NY. 7 Holly Drive, Bayshore, NY 11706

Colaguori, Victor J. (M 1974) Retired. (Previously 34 years with the US Army Electronics Command). 240 South Lincoln Avenue, Oakhurst, NJ 07755

Couch, Richard H. (M 1974) President, GTE International Systems Corp. 140 First Avenue, Waltham, MA 02154

Daly, Eugene F. (M 1974) President, The Communicators, 250 South B. St., San Mateo, CA 94401

Deitz, Sydney L. (M 1974) Senior Electronic Technician, Naval Air Propulsion Test Center, W. Trenton, NJ. 14 Wickford Avenue, Trenton, NJ 08618

Eitel, LaNeil (M 1974) Partner, Sutro Ranch and Laboratory, Dayton, NV. Active in the amateur satellite program. P.O. Box G., Dayton, NV 89403

Eitel, William W. (M 1974) semi-retired, founder of Eimac (tubes) in 1934, now active in the amateur satellite program. P.O. Box G., Dayton, NV 89403

Elder, William E. (M 1974) Chief, Telecommunications, American Trucking Associations Inc., Washington, DC 3322 Albion Court, Fairfax, VA 22030

Ganzenhuber, John H. (M 1974) President, Hughey & Phillips, Inc., 3050 No. California St., Burbank, CA 91505

Gumport, Stephen L., M.D. (M 1974) Professor of Surgery, NYU Medical Center, New York, NY. 244 East 68 St., New York, NY 10016

Hively, Robert R. (M 1974) Director of Communications, County of San Diego, CA. 2643 Soderblom Avenue, San Diego, CA 92122

Jarvis, Frank H. (M 1974) Military Communications Coordinator, New York Telephone Co., Military Communications, 1095 Avenue of the Americas, New York, NY 10036

Jones, Carl Don (M 1974) District Manager, E.F. Johnson Co., Glen Burnie, MD. Box 13, RD No. 3, Volant, PA 16156

Kaemmerer, Harry(M 1974) Staff Supervisor, CCTV Planning, AT&T Co., New York, NY. 6 Patton Drive, Somerset, NJ 08873

Karr, Bruce M. (M 1974) Consultant, Communications Systems,, 4202 Chapman Way, Lake Oswego, OR 97034

Lindenblad, Nils E. (M 1974, F 1974) Retired (RCA engineering and research 1920 to 1965). 44 Shady Brook Lane, Princeton, NJ 08540

Lotz, Walter E., Jr. (M 1974) Lieutenant-General, U.S. Army, Retired. 912 Dalebrook Drive, Alexandria, VA

Miller, William L. (M 1974) Director, Communications Division, Chicago Police Dept., 1121 South State St., Chicago, IL 60605.

Morgan, Eugene L. (M 1974) Communications Engineer, HY-Gain Electronics Corp., Lincoln, NB. 4811 South 45th, Lincoln, NB 68505

Munro, John A. (M 1974) Manager, Southeastern Area Sales, RCA Mobile Communications Systems, Atlanta, GA 2660 Frontier Trail, Chamblee, GA 30341

McKenney, Paul K., Jr. (M 1974) President, Repco, Inc., P.O. Box 7065, Orlando, FL 32804

McLeod, James S. (M 1974, F 1974) Senior Vice President, Page Communications Engineers, Inc., 801 Follin Lane, Vienna, VA 22180

Oliver, Benjamin H. (M 1974) Retired, former Executive VP, AT&T; former President, AFCEA. 9100 Burning Tree Road, Bethesda, MD 20034

Prior, William A. (M 1974) President, Aerotron, Inc., US Highway One North, Raleigh, NC 27608

Puett, J.W.F. (M 1974) Proprietor, Puett Electronics, Mesquite, TX; maintains antique radio museum. 3008 Abston Drive, Mesquite, TX 75149

Rockwell, Paul D. (M 1974) Independent Consulting Engineer, telecommunications. 500 Hillburne Way, Chevy Chase, MD 20015

Root, L. Eugene (M 1974) Retired, formerly group vice president, Lockheed Aircraft Corp., president Lockheed Missiles & Space Corp. 1340 Hillview Drive, Menlo Park, CA 94025

Rose, Joseph (M 1974, F 1974) Deputy Manager, National Communications System, Washington, DC. 4203 Sandhurst Court, Annandale, VA 22003

Sessions, Ken W. Jr., (M 1974) Executive Editor, TAB Books, Blue Ridge Summit, PA 300 Donnybrook Drive, Hagerstown, MD 21740

Shafer, John F. (M 1974) Physicist, Law Enforcement Laboratory, U.S. Bureau of Standards. 941 Teller Circle, Boulder, CO 80302.

Stevens, Thomas W. (M 1974) District Sales Manager, Mobile Radio Dept., General Electric Co., Edmond, OK. P.O. Box 976, Edmond, OK 73034

Stone, W. R. (M 1974) Executive Vice President, E.F. Johnson Co., 299 10th Avenue S.W. Waseca, MN 56093

Sudia, Andrew T. (M 1974) Self-employed, electronics engineering, marketing. 1556 Putty Hill Avenue, Towson, MD 21204

Tary, John J. (M 1974) Electronic Engineer, U.S. Dept. of Commerce. 7739 Spring Drive, Boulder, CO 80303

Thompson, Robert W. (M 1974) Manufacturers Representative — Electronics. 14715 Eastview Drive, Los Gatos, CA 95030

Warshaw, David (M 1974) Retired, formerly Technical Supervisor, ITT for 35 years. Specialist in propagation predictions, solar flares. 141 Quaspeck Blvd., Valley Cottage, NY 10989

Warshaw, Marguerite E. (M 1974) Writer and moderator of three cable TV programs weekly. 141 Quaspeck Blvd., Valley Cottage, NY 10989

Waite, Amory H. Jr. (M 1974) Retired US Government Research Engineer, Ft. Monmouth, NJ. Lecturer on Arctic/Antarctic. 40 Monmouth Blvd. Oceanport, NJ 07757

Williams, Grant L. (M 1974) Retired, formerly Signal Officer and Communications Officer of various military organizations, including Signal Officer First Army for the Normandy landing, 1944. 12-P, Northgate Apts., Camden, NJ 08102

A 30-year Anniversary

Three of our newer members — Victor Colaguori, Amory Waite, and Col. Grant Williams — were linked up just 30 years ago in one of the most important communications projects of the century — the hookup between Britain and France at the invasion of Normandy in 1944.

Col. Williams was Signal Officer of the First Army during the invasion, and directed the project. Civilians Colaguori and Waite manned the stations on Normandy Beach and the Isle of Wight.

Colaguori was the man who went ashore at Normandy Beach. Though Amory Waite insisted that his experience in the Navy and the National Guard in the '20's fitted him better to take part in and to survive active combat operations, Colaguori refused to see the point, and they tossed a coin to break the deadlock.

Military experience may have proved useful. As is well known today, the Army had trouble clearing the beach, and the communications crew were held off-shore in their landing craft for 24 hours. In any case, Vic got ashore on D-2 day, moved to a slightly elevated area inland, set up an antenna and started sending with a Link 70-100 MHz FM rig. "I heard him the first time he pushed the key down," says Waite.

After the war, Col. Williams continued an adventurous career in communications, with such jobs as managing a missile tracking station in the Bahamas, working for RCA on the BMEWS in Alaska and in Yorkshire, and on the Autodin project for computerized communications for the Air Force.

Amory Waite went back to the Arctic and Antarctic work in which he had been engaged since 1933 (he was one of three who rescued Admiral Byrd in 1934) and to developing remote-control and other electronic devices for military and Polar use. His depth-measuring equipment can measure ice to 14,000 feet with 20 watts.

Victor Colaguori remained with the Army Electronics Command at Fort Monmouth. This summer, after 34 years engaged in developing communications equipment for tactical use, he retired. Col. Williams, Amory Waite and Fred Link were invited to the farewell party given in his honor, some of them meeting for the first time since World War II.

Radio Club Professional Directory

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QUINTEN G. CUMERALTO, PE
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313-765-9335

W. G. H. FINCH, PE
PE & Reg. Patent Attorney
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Oak Park, IL 60302
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Woodland Hills, CA 91364
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R. W. JOHNSON (W6MUR)
Professional Consulting Engineer
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Ben Lomond, CA 95005

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Scottsdale, AZ 85251
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San Diego, CA 92111

RAMSEY McDONALD
Dial Paging Consultant
159 Beacon Lane J.I.C.
Jupiter, FL 33458
305-746-0954

LOREN McQUEEN
Communications Consultant
2633 South Bascom Avenue
Campbell, CA 95008
408-377-2900

STUART MEYER (W2GHK/4)
Chmn. 1975 ARRL National Convention
2417 Newton St.
Vienna, VA 22180
703-281-3806

ANTHONY NATOLI
Comms. Systems Consultant
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F. H. SHEPARD, Jr. PE
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Electronic, Electromechanical Systems
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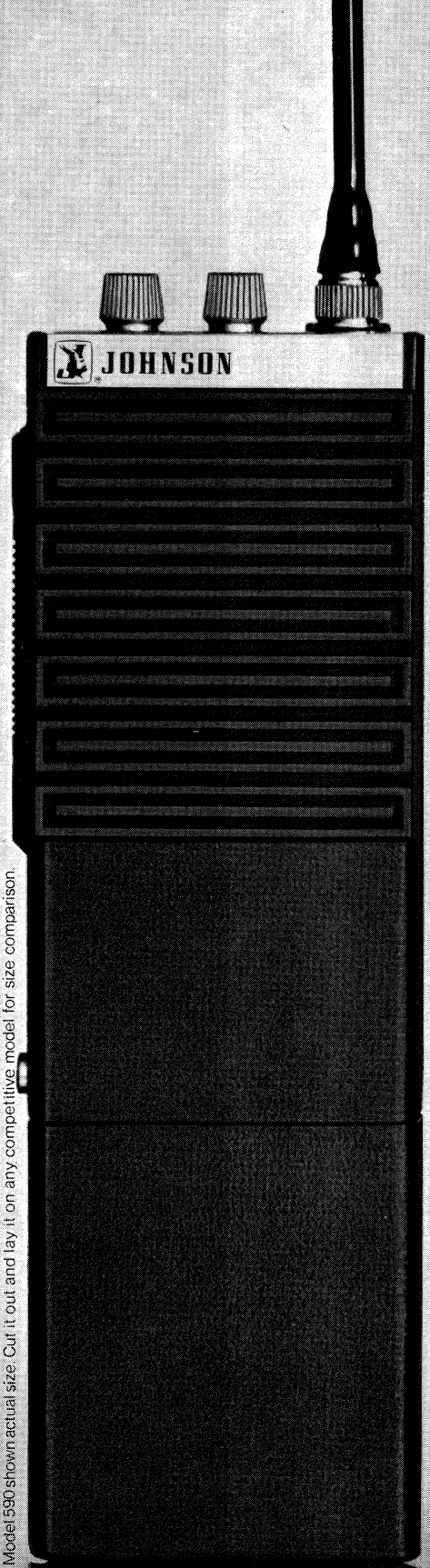

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