



PROFESSIONAL
GROUP ON
RADIO
FREQUENCY
INTERFERENCE

NEWSLETTER

NUMBER 3

AUGUST 1958

FOURTH CONFERENCE ON RADIO INTERFERENCE
OCTOBER 1 AND 2, 1958 AT
MUSEUM OF SCIENCE & INDUSTRY, CHICAGO, ILL.

THE FOURTH CONFERENCE ON RADIO INTERFERENCE REDUCTION AND ELECTRONIC COMPATIBILITY WILL BE CONDUCTED BY THE ARMOUR RESEARCH FOUNDATION OF THE ILLINOIS INSTITUTE OF TECHNOLOGY UNDER AGREEMENT WITH THE U.S. ARMY SIGNAL RESEARCH AND DEVELOPMENT LABORATORIES, FT. MONMOUTH, N. J., ON OCTOBER 1 AND 2, 1958 AT THE MUSEUM OF SCIENCE & INDUSTRY, CHICAGO, ILL. THE PROFESSIONAL GROUP ON RADIO FREQUENCY INTERFERENCE WILL CO-OPERATE IN THE PROGRAM.

SEVERAL PAPERS WHICH WILL BE PRESENTED WILL DEAL WITH THE UTILIZATION OF COMPUTER TECHNIQUES IN RELATION TO LARGE SCALE INTERFERENCE PROBLEMS. OTHER PAPERS WILL BE DEVOTED TO INSTRUMENTATION FOR OBTAINING OBJECTIVE MEASUREMENTS OF THE STRENGTH OF INTERFERENCE, AND METHODS OF SUPPRESSING INTERFERENCE IN EQUIPMENT. A TOTAL OF 35 PAPERS DEALING WITH THE MILITARY AND OTHER ASPECTS OF THE PROBLEMS OF RADIO INTERFERENCE REDUCTION WILL ALSO BE PRESENTED.

HAROLD SCHWENK, CHAIRMAN OF PGRFI, WILL BE THE LUNCHEON SPEAKER AND LT. J. P. McNAUL AND W. E. PAKALA HAVE BEEN SELECTED AS SESSION CHAIRMEN.

IF YOUR NAME IS NOT DOWN ON THE LIST TO RECEIVE AN INVITATION AND ALL FURTHER DETAILS WRITE TO MR. I. COHN, ARMOUR RESEARCH FOUNDATION, 3201 S. MICHIGAN AVE., CHICAGO 16, ILL.

Technical Papers Committee Calls for Papers

The Technical Papers Committee is planning publication of a TRANSACTIONS to begin as soon as possible, probably sometime in the fall. Any person in a position to make a contribution to the TRANSACTIONS is encouraged to submit a paper, or preliminary abstract of a possible paper, to the chairman of the Technical Papers Committee at his earliest convenience: R. M. Showers, Moore School of Electrical Engineering, 200 S. 33 Street, Philadelphia 4, Pa.

The Following tentative policy on publication has been established by the Technical Papers Committee:

Papers published in the TRANSACTIONS of the Professional Group on Radio Frequency Interference should be designed to serve the members of the group. This can best be done by:

- maintaining technical standards
- publishing tutorial articles of timely interest
- publishing new developments in the various areas of interest to the group, namely:
 - methods of measurement and control, and related components, instrumentation, and techniques
 - systems considerations, including susceptibility vulnerability, compatibility, frequency allocation problems, related propagation effects, and role of human operators

- studies of the origin of interference: man-made and natural and its characteristics.

More About the Armour Conference:

Approximately 450 persons are expected to attend the Fourth Conference on Radio Interference Reduction. It is only at such meeting that it is possible to meet those engaged in all aspects of interference control and to get answers to many of the questions which are stirring you. Our subject is so new that everybody can have something to contribute. You may have just the answer which somebody else is looking for and he may be able to help you. But we all have to be there.

So, here's seeing you at the Conference. You owe it to your company and yourself to be there.

ITEMS OF INTEREST FROM OUTSIDE SOURCES

Electrical Interference, An Article About:

An article, which discusses the fundamentals of interference reduction, titled, "Electrical Interference" and written by Dr. James Coe, Army Electronic Proving Ground, Fort Huachuca, Arizona appears on pages 1046-1049 in the June 1958 issue of INSTRUMENTATION AND AUTOMATION.

Some paragraph headings are: Magnetic fields, electrostatic field radio-frequency interference; interference generated by instrumentation; detecting interference; reducing the cause; neutralizing transfer; shielding, grounds, corrective action and filtering.

Reducing Radio Interference to Missiles:

MILITARY ELECTRONICS, June 1958, page 30, carries a two-page article by Leonard W. Thomas, Electronic Design & Development Division, U. S. Navy Bureau of Ships, under the above title. Subheadings are: Definition of interference; silencing procedure, analysis phases.

Jamming Nomograph

A two-page nomograph on jamming starts on page 83 of ELECTRONIC engineering edition, June 20, 1958. It was prepared by George I. Operations Research Dept., Engineering Research Institute, University of Michigan, Ann Arbor, Mich. It is described as a "Radar free-space noise jamming susceptibility nomograph which determines susceptibility of radar to noise jamming rather than effectiveness of the jamming...."

Metal-Graphite and Radio Interference Noise Levels:

The Stackpole Carbon Co., St. Mary's, Pa., has page 30 in its catalog 12A devoted to results of tests on suitable contact materials to reduce radio interference caused by moving contacts.

Atmospheric Radio Noise:

A report is available on the above subject as follows: Investigation of Atmospheric Radio Noise, by P. N. Nawrocki, Engineering and Industrial Experiment Station, Nov. 1956, 40 pp. microfilm \$3.00 photocopy \$6.30. Order PB 126602 from Library of Congress, Washington 25, D. C.

Atmospheric Angels Mimic Radar Echoes:

ELECTRONIC engineering edition, March 14, 1958, page 140, carries an article by Vernon G. Plank, Air Force Cambridge Research Center, Bedford, Mass., with the above title. It describes spurious indications on a radar screen of an object in space when nothing is visible.

Transparent Electrically Conductive Coating:

ELECTRICAL MANUFACTURING, March 1958, page 143, has an article with the above title by E. R. Olson and E. H. Lougher, of Battelle Memorial Institute, Columbus, Ohio. It describes a new transparent conductive coating developed for the Air Force primarily for the purpose of preventing formation of fog, frost and ice on aircraft windshields and side panels. A suggested possible use is as an anti-static coating for electrical instrument windows.

Television Interference, Its Causes and Cures:

Philip S. Rand has brought out a book, under the above title, as a sort of television interference handbook. It is 56 pages and is published and distributed by the Nelson Publishing Company, Redding Ridge, Conn. for \$1.75.

Frequency - Diversity Radar:

ELECTROMECHANICAL DESIGN, March 1958, carries an article under the above title which deals with improved radar displays. It describes several solutions found by the Compagnie Generale de Telegraphie sans Fil of France under the following headings: Improvement of signal-to-noise ratio by operating in frequency diversity or by means of devices that correlate the useful signals; suppression of fixed echoes (or signals from targets having a definite radial velocity) by means of eliminators using memory tubes; and elimination of spurious signals by an equipment designed to deal with the random nature of background noise.

Radar Effects on Electronic Circuits:

W. G. Egan, Ford Instrument Co., has written an article, under the above title, in the March 19, 1958 issue of ELECTRONIC DESIGN, page 52. The article states "High power radar transmitters have considerable effect on electronic circuits... When used near operating radar equipment, they are subject to serious error. Digital computers and nuclear scalars are also subject to triggering from radar pulses."

Calculating Noise in Electrical Resistors, A Nomogram:

A. E. Maine, DeHavilland Aircraft of Canada, Ltd., has prepared a one-page nomogram in the March 1958 issue of ELECTRONICS INDUSTRIES, page 70. The introduction states "Johnson noise for a given amplifier can be quickly determined given the value of input resistance and ambient temperature of operation."

Bridge Method of Measuring Noise in Low-Noise Devices at Radio Frequencies:

In the PROCEEDINGS OF THE IRE, April 1958, page 779 is a letter by Keith S. Champlin, Dept. of E. E. Univ. of Minnesota, describing a system used for accurately measuring the noise of junction diodes biased in the forward direction. A schematic of a noise bridge circuit is given.

Theory of Stronger-Signal Capture in FM Reception:

In the PROCEEDINGS OF THE IRE, April 1958, page 728, is an article by Elie J. Baghdady, Dept. of E. E., M. I. T., Cambridge, Mass., under the above title. The characteristics of the FM disturbance that is caused by two-signal interference are pointed out and compared with the characteristics message modulation. The comparison suggests a new role for the amplitude limiter in FM receivers.

Harvard Observatory Cosmic Noise Maps Available:

A series of eight grid cosmic noise maps, with two pairs of transparent overlay radio noise maps of the sky, has been published by the Harvard College Observatory, Cambridge 38, Mass. at a cost of \$.00 plus postage.

Each pair of maps represents the radio sky as it would appear to an observer with an antenna of half-power beamwidth 20° , at a frequency of 10 mc sec-1. The second pair shows the sky for an antenna of half-power beamwidth 10° at frequency 200 mc sec-1. Each map thus consists of two parts; one covering the northern celestial hemisphere, north to declination -20° ; and the other covering the southern hemisphere.

sphere, north to declination -20° . The maps employ equatorial coordinates on the polar stereographic projection.

Interference Reduction Program of the U. S. Army Signal Corps:
The April 1958 issue of SIGNAL carries an article under the above title by J. J. O'Neil, Deputy Chief, Suppression & General Engineering Branch, Communications Dept. U. S. Army Signal Engineering Labs., Fort Monmouth, N. J. The article states that a booklet entitled "Suppliers of Radio Interference Suppression Components" is periodically prepared and distributed to all Army contractors to assist in procuring components approved under specifications MIL-C-12889 & 11693; MIL-F-15733 and MIL-S-12944.

Interference Problems on Small Boats:

RADIO & TV NEWS, May 1957, carried an article by Elbert Robbers under the above title. It describes the various suppression methods now in use and the short-comings of each. It also mentions other sources of interference on a small boat which are often blamed on the ignition of the motor. (Also reprinted in BuShips Journal for July 1958).

Radio Fading Seen Caused by Gas Layer:

Hugh Odishaw, executive secretary of the U. S. National Committee for the International Geophysical Year, made a report before the American Association for the Advancement of Science, in January 1958 that IGY scientists have obtained tentative confirmation of a theory that the earth is sometimes encircled in the high atmosphere by an "electric jet" current of several hundred thousand amperes. There may also be "magnetic fields" in space similar to the one surrounding the earth.

Conclusive evidence has been obtained from rocket experiments that radio fadeouts are caused by a kind of base-layer of electrically-charged gas extending at certain times some 12 miles below the normal lowest level of the ionosphere.

Solderless Grounding for Braided Shields:

ELECTRONIC EQUIPMENT ENGINEERING, June 1958, pages 48-50, has an article, under the above title, discussing the many problems arising from the poor grounding of braided shield and coaxial cables and tests which have been made with solderless connectors.

Atmospheric Noise Interference to Short-Wave Broadcasting:

The March 1958 issue of the PROCEEDINGS OF THE IRE carries an article by S. V. Chandrasekar under the above title.

Russian Translations:

ELECTRONIC DESIGN, May 14, 1958, page 170 carries the following information about Russian translations:

Consultants Bureau, Inc., 227 W. 17th St., New York 11, New York translates "Automation and Telemechanics" regularly.

Pergamon Press, 122 East 57th St., New York 22, N. Y., is preparing translations of "Radio Engineering", "Radio Engineering and Electronics" and "Electrical Communications".

Readers interested in specific Russian journals can obtain more information by writing directly to one of these publishers.

The following translation from the Russian is also mentioned:

Mutual Interference Between Circuits of High Frequency Cables of Symmetrical Construction, by V. O. Shvartsman, EC 8/57, pp 39-49, 7 figs., (Translated by Pergamon Press).

Speech Intelligibility Meter Developed:

A Speech Intelligibility meter has been developed by General Electronics Laboratories, Inc., Cambridge, Mass. It gives valid readings with many types of disturbances of non-linearities in the signal chamber under test, such as: noise or tone interference, clipping, fast interruptions and frequency distortion. A special RMS voltmeter for speech and noise measurements is included in the equipment.

Noise Figure vs Frequency Curve of Transistors Discussed:

ELECTRONIC DESIGN, July 9, 1958, pages 7-8, discusses the noise figure of present-day transistors for the range of frequencies for which thermal noise is the predominant component. A typical noise figure vs frequency curve is shown in Fig. 2.

MEETING OF ADMINISTRATIVE COMMITTEE, March 24, 1958

A meeting of the IRE-PGRFI was held at the IRE Headquarters, 5 E. 79th St., N. Y. C. on the first day of the IRE Convention, Monday, March 24th, 1958. The meeting was called to order at 9:15 AM by Chairman Schwenk.

1. Roll Call

The first order of business was a roll call. Present were the following: Members of Admin. Comm: Messrs. Fairweather, Grobowski, Kall, Kant, McNaul, Milton, Pakala, Schenker, Schwenk, Showers. Absent: Burruano, Chrichlow.

Other IRE or PGRFI members: Messrs. Daniels, Jarva, Kugler, Schreiber, Vasaka, and Emberson (for IRE Headquarters).

2. Minutes of Previous Meeting were read and approved.

3. Correspondence with Dr. Baker on Disputed Item of Scope "Frequency Allocations" was read.

4. Committee Appointments

Of the 11 committees specified by our By-Laws, Chairman Schwenk has appointed nine.

Technical Papers Committee: Dr. R. M. Showers, 200 South 33 St., Philadelphia 4, Pa.

Technical Advisory Committee: A. R. Kall, 431 West Tabor Road, Phila. 20, Pa.

Liaison Committee: L. Milton, Filtron Co., Inc., 131-05 Fowler Ave. Flushing 55, New York

Constitution and By-Laws Committee: M. Kant, Sperry Gyroscope Co. Mail Station I-37, Great Neck, New York

Newsletter Committee: R. Daniels, Interference T & R Lab., Inc. 150 Causeway St., Boston 14, Mass.

Chapter Activity Committee: Z. V. Grobowski, Jansky & Bailey, 1339 Wisconsin Ave., N.W. Wash., D.C.

Publications Committee: O. P. Schreiber, 424 Howard Ave., Middlesex, N. J.

Membership Committee: R. W. Fairweather, 318 Colony St., West Hempstead, N. Y.

Meetings Committee: 1st Lt. J. P. McNaul, Ass't Project Officer, Project Monmouth, Signal Eng., Lab., Fort Monmouth, N. J.

5. Report on Professional Groups Committee Meeting, February 18, 1958

It was recommended that PG TRANSACTIONS be sent to colleges and that meetings be held with foreign countries. Other items from this meeting were a review of an ad hoc committee. It was concluded that as long as a professional group can support itself it will exist. Dr. Showers questioned whether this referred to financial solvency and Mr. Emberson defined the point as successful publications of TRANSACTIONS. It is desirable, on this point, that all PG's use the same format, but this is likely to be expensive.

A collateral point arose on advertising in group TRANSACTIONS as a source of revenue. It was stated at the meeting that advertising rates in a PG TRANSACTIONS cost three times that of the regular IRE TRANSACTIONS. (Mr. Schreiber said that two times was a better estimate.) Some PG's are in favor of advertising in TRANSACTIONS, others opposed. Mr. Emberson explained the higher rate as a defensive measure, to prevent too heavy a cut into ads in the main IRE PROCEEDINGS. Mr. Schreiber commented that some advertisers don't want too general an audience and would rather advertise in PG TRANSACTIONS.

6. Treasurer's Report

Lt. McNaul, Treasurer, gave his report as follows:
For the period 10/10/57 to 2/28/58:

Income	Total Assessments	\$253.00
	IRE Matched Funds	253.00
	Total Receipts.....	\$506.00

Expenses	Membership Service Charges	\$44.68
	Luncheon Ticket Printing	1.97
	Total Expenses.....	\$46.64
	Balance as 2/28/58	\$459.35

Mr. Grobowski questioned the term "Membership Service Charge". Lt. McNaul said this is an IRE charge for billing. Mr. Schwenk suggested the use of the term "fee" instead of "assessment".

7. Reports from Committees

a) Membership Committee:

Mr. Fairweather, Chairman, reported that no meeting of his committee had yet been held. He reported that we have 150 paid-up members. Mr. Fairweather brought up the question of Group affiliate. He has a list of some 30 possible Groups, which he will weed out.

Mr. Milton observed that we have not publicized ourselves enough. Many people to whom he has spoken have read or heard nothing of PGRFI since our first meeting (Asbury Park, 11/20/57).

Dr. Showers noted that we have no publicity committee. Mr. Schreiber replied that this is a function of the Membership Committee to publicize the Group, and each Committee is to publicize its own activities.

b) Meetings Committee:

Lt. McNaul, Chairman, had asked four men to serve and has received two acceptances.

c) Technical Papers Committee:

Dr. Showers, Chairman, sent out appointment notices last week. Functioning of this committee, he said, will depend on the Meeting Committee's functions. He suggested the idea of a "paper bank", accumulation of technical papers which can be drawn from as requested (See request of Dr. Showers for technical papers for TRANSACTIONS on page 6).

d) Newsletter Committee:

Mr. Daniels, Chairman, reported that the second newsletter on PGRFI is in process and he urged those present to contribute news items. Mr. Kugler asked whether "Quasies and Peaks" will still be published. Mr. Daniels replied that it would not.

e) Publication Committee:

Mr. Schreiber, Chairman, had consulted on technical details with Mrs. Duffy. For a predicted membership of 500, we will need to 1500 copies of our publications:

500 for members
700 for companies and libraries (paid subscribers)
200 stock of back issues
100 extra cushion
1500

Mr. Schreiber urged that we print papers only once and use only first material. He suggested that we publish twice a year. He has recommended appointments to his committee.

f) Chapter Activities Committee:

Mr. Grobowski, Chairman, reported that 10 have been nominated to his committee, with 5 more to be nominated for a total of 15. None are members of the Administrative Committee.

g) Nominations Committee:

No appointments yet. No report.

h) Constitution and By-Laws Committee:

Mr. Kant, Chairman, Discussion will be under "New Business".

i) Awards Committee:

No appointments yet. No report.

j) Liaison Committee:

Mr. Milton, Chairman, announced the composition of this committee, as follows:

<u>Name</u>	<u>Liaison with</u>
Grobowski	CIC
Pakala	ASA-C63
Showers	IRE
Schenker	EIA (formerly RETMA)
Pakala	AIEE
Kant	AIA
Milton	CISPR
Randall	Military
Schwenk, Ex-officio	

k) Technical Advisory Committee:

Mr. Schwenk at this present meeting announced his appointment of Mr. Kall as Chairman and gave him a list of suggested members.

8. Nominations

At Mr. Grobowski's suggestion, Mr. Kall re-read the section of the minutes of the last meeting dealing with nominations, for the benefit of new members present.

9. Unfinished Old Business

No word from Dr. Baker

10. New Business: Constitution and By-Laws

1. Constitution

(a) There was some discussion on 12 vs 15 Administrative Committee members. Mr. Milton suggested a maximum of 15. Mr. Grobowski said we should hold to 12 now. The motion was made and seconded that the Administrative Committee formally be constituted at 15 members, with 3 positions left vacant until the next period (beginning July 1st, 1958). Passed unanimously.

(b) Art. III, Sec. 2. Dr. Showers suggests we change the word "interference" to "conflict".

Art. V, Sec. 7. Dr. Showers claimed this conflicts with Art. I, Sec. 4 of the By-Laws. Lt. McNaul and Mr. Kant explained that special committees are "ad hoc" appointments. To clarify this point, Dr. Showers moved that the second line be changed to read: "Special committees authorized by the Administrative Committee shall be appointed by the Chairman." Mr. Schenker seconded. Passed unanimously.

(c) Mr. Grobowski brought up the subject of re-elections of Administrative Committee members. Mr. Emberson said that some groups have a provision that Administrative Committee members must have a one-year lapse after serving three years, but they still allow the chairman, whose normal term is one year, to be re-elected for a total of three years.

Dr. Showers proposed that no office be held for more than two successive terms. Mr. Grobowski moved that Art. V, Sec. 2 of the Constitution be amended as follows: "A member of the Administrative Committee cannot be re-elected to the Administrative Committee without a lapse of at least one year." Dr. Showers seconded. There was then considerable discussion. The original motion was then voted on and passed unanimously.

1) Art. V, Sec. 3. Mr. Grobowski suggested adding to the indicated sentence: ".....with an officer not to be elected for more than two successive terms." Lt. McNaul moved that this change be made. Mr. Grobowski seconded. Passed unanimously.

II. By-Laws

a) Mr. Kant, on notes submitted by Mr. Schenker (incorporated herein by reference), made three suggestions which were put in the form of motions by Mr. Schenker:

Art. VI, Sec. 3: in the first sentence "At the Annual Meeting, the coming hold-over members of the Administrative Committee shall elect the members to fill the vacancies on the Administrative Committee" the words "the coming hold-over members" should be stricken out. (Paragraph 3 of the Suggested By-Laws, Appendix C of the IRE

PG Manual has no such restriction) Lt. McNaul seconded. Passed unanimously.

The other two suggestions were relatively minor ones on grammatical construction. A fourth related to the Constitution, Art. VII, Sec. 5 and recommended that 8 members constitute a quorum.

(b) Dr. Showers: Art. III, Sec. 2. Suggested that the committees make this consistent with IRE policies and our Administrative Committee.

Dr. Showers: Art IV, Sec. 3. Suggested that item 12 be stricken.

(c) Mr. Pakala: Art. II, Sec. 15. Suggested that last sentence begin "The name of this representative shall be....."

Because of the large number of proposed Constitution and By-Law changes, it was suggested that Mr. Kant re-write the Constitution and By-Laws (knowing the intent of the Administrative Committee on all the proposed changes) and make a package presentation to the IRE Executive Secretary.

Dr. Showers added the following additional comments:

Art. VI, Sec. 2: in the fifth line, change the number of members from 25 to 10.

Art. I, Sec. 3: in the 6th line, delete the words "or all". The present reading is too restrictive on the committee chairmen's functions.

Mr. Kant said that these suggestions would be included in his re-writing.

Dr. Showers now moved that the Constitution and By-Laws be approved as amended today, subject to our approval of an editorial version (with indicated amendments and editorial changes). Mr. Kant seconded. Passed unanimously.

Mr. Schwenk had observed that the Constitution and By-Laws must be in effect by the end of April.

11. New Business - Armour Conference

Mr. Schwenk read a letter from Armour Research Foundation stating that a Symposium on RFL, sponsored by USASEL, will be held October 1-3, 1958 at the Chicago Museum of Science and Industry, and suggesting cooperation by PGRFL.

There was then varied comment from the group.

The meeting was adjourned at approximately 1:30 P. M.