



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

Volume 15, No. 2

February 19, 1960

1. Radio - Past, Present and Future
2. Fran Ryan Retires
3. Overseas and High Seas 1959 Service Results
4. TL Microwave Development
5. Motorola Type Acceptance
6. 2182 KC Radiotelephone Alarm Signal News
7. 450 MC Control Provision for Common Carriers
8. Telephone Maintenance Radio at Buffalo
9. ITU Plenipotentiary Conference
10. New TD-2 Route
11. Organization Change
12. Radio Information

Attached - New Notes for the Radiotelephone Distress Call
- Map of Bell System Overseas Telephone Service
- Map of Bell System Television Network Routes

Printed in U.S.A.

1. RADIO - PAST, PRESENT AND FUTURE

Your editor has asked me to write something for RADIO NOTES on the occasion of my retirement from the Bell System. I know it is fashionable at such times to make predictions for the future. Relieved of responsibility for the implementation of these predictions they can be bold and unrestrained. Although this offers a tempting opportunity it seems to me that I would be on safer ground if I confined my remarks, for the most part, to the past and the present.

My interest in radio was first aroused in 1907 when visiting an aunt in Berkeley, California. Next door to her home there was a tall white mast in a back yard. This, I found was the antenna support for an amateur radio station which I was soon invited to visit. It was here that I was smitten with the "radio bug".

Now what was the status of the radio art in 1907? This was the year that "Fighting Bob Evans" undertook to take the great white fleet of American naval vessels around the world. When this fleet steamed in through the Golden Gate into San Francisco harbor a number of the vessels were using experimental arc radiotelephone transmitters of DeForest design. Most radio communication at that time, however, was by telegraphy using spark transmitters. These transmitters radiated a very broad band of frequencies so that it was impossible to carry on more than one radio communication at a time in the same geographic area.

What a different situation we have today. We find now that in many areas thousands of radio communications are in progress simultaneously. It would take more space than RADIO NOTES can spare to list all of the channels of communication that are being accommodated simultaneously in the radio spectrum in the New York area where this is being written. In addition to the thousands of telephone channels in the microwave range there are the similar channels used by the telegraph companies and others. In other parts of the spectrum one finds seven television broadcast stations and dozens of aural broadcast stations. Added to this are the various marine and other mobile services, the overseas services, the amateurs and last but not least, the many government services, particularly those of a defense character. The number of simultaneous communications in progress is truly amazing.

Now what has brought about this tremendous increase in the traffic capacity of the radio spectrum? In part it has been brought about by a widening of the spectrum itself. This has come about as ways have been found to utilize higher and higher frequencies. Another important factor has been the improvements in technique which have narrowed the band of frequencies transmitted and have improved the selective circuits for separating channels. Another, especially important at the higher frequencies, has been the development of highly directive antennas for both transmitting and receiving.

Printed in U.S.A.

Looking back and seeing how much has been accomplished in the past gives one courage for the future. There seems little doubt but that ways will be found to effectively utilize frequencies much higher than those now in use. Moreover, in many portions of the spectrum, there still remains an opportunity for improved frequency utilization. In the period ahead, the part of the common carrier should be of great importance. Such carriers serving a community can bundle together the communication requirements of many. This makes possible the establishment of facilities of substantial capacity. Maximum frequency utilization and maximum economy is only possible by the employment of such facilities and the carriers are uniquely qualified to provide them.

Twenty years ago radio was generally regarded as suitable only for bridging barriers such as oceans and to provide mobile services where the use of wires was not possible. In the past decade it has come to be an important tool in providing domestic over-land long distance telephone facilities and accounts for a steadily increasing percentage of the inter-city circuit mileage of the Bell System. At the same time, radio has taken second place to cables in the overseas service. The situation now is almost the direct opposite of what it was twenty years ago. The possibility of using satellites as repeaters is opening new frontiers to investigation. Will radio regain its position of pre-eminence in the overseas field? I do not know the answer to this question, but I feel certain that the years directly ahead will be challenging and interesting ones for radio engineers.

F. M. Ryan

2. FRAN RYAN RETIRES

On January 28 an Open House for Fran Ryan was held here at 195 to honor him on the occasion of his retirement from 40 years of Bell System service. The following night a Testimonial Dinner was given in his honor attended by more than 80 of Fran's Bell System friends. The accumulation of radio talent at this meeting was indeed impressive.

Mr. Ryan has always been an outstanding personality in the radio field. His far-sightedness and good judgment have been important factors in securing and maintaining a prominent position for the Bell System in the use of radio for public communication.



3. OVERSEAS AND HIGH SEAS 1959 SERVICE RESULTS

During 1959 a record total of 3,004,081 overseas point-to-point telephone messages were handled, representing an increase of about 15 per cent over 1958. About 60 per cent of this total was carried on cable while the remaining 40 per cent was handled on radio facilities. Calls to Alaska and Hawaii accounted for 762,873 messages.

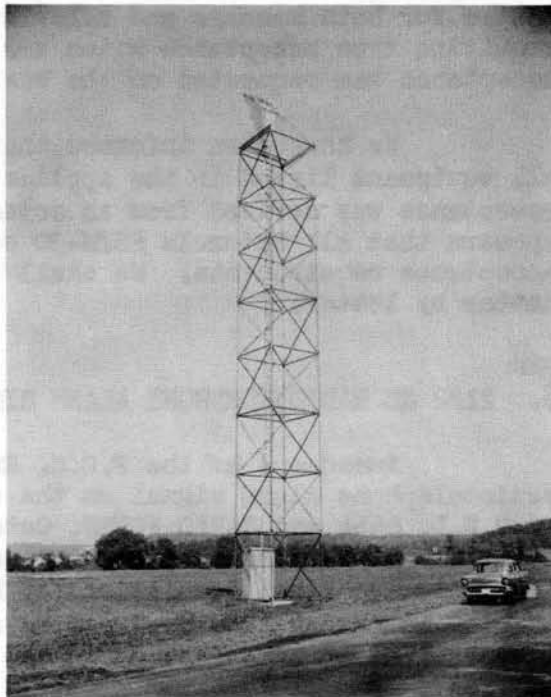
In addition to the above point-to-point totals 43,844 messages were handled to ships in the high seas service.

4. TL MICROWAVE DEVELOPMENT

An experimental model of a simplified microwave radio relay system for very light route telephone applications has been on test at the Holmdel Laboratories for about two years. Features of vital concern to this prototype system were low cost, reliability sufficient for telephone service, and transmission performance adequate for Bell System use. During the test period this system was referred to as Microwave Pole Line or MPL. The photograph shows one terminal of the MPL test.

Development of such a microwave system as a standard Western Electric item is now proceeding on an expedited basis. The first manufactured units are expected in approximately 18 months. The new system has been dubbed "TL Radio System".

As presently conceived, the basic TL system building block will be a pole or tower mountable housing containing a transmitter, receiver, alarm and order wire, power converters and storage batteries. This basic unit would be completely equipped and tested at the factory. At the radio site it should only be necessary to mount the housing, install the batteries and connect the antennas, multiplex and AC power. A repeater would be two such radio terminal units connected by simple means at baseband.



Printed in U.S.A.

The TL system will be initially engineered to carry 48 message channels through nine repeaters for a total distance up to 75 miles with no diversity. The system will operate in the 11 kmc band with a nominal transmitter power output of 100 milliwatts. Provision for battery reserve is planned. The system will be completely transistorized except for klystrons. Because of time considerations, early TL systems will probably use existing carrier equipment such as ON-2 for channelizing. PCM appears attractive for TL use, and studies are currently being made along this line.

Studies are continuing to determine more accurately how TL will best be used. Every effort is being made to keep the overall costs low. Minimum engineering, installation and ordering options are essential to this end. We shall keep the Companies posted as to progress on this interesting project.

5. MOTOROLA TYPE ACCEPTANCE

Last year Motorola submitted to the F.C.C. an application for type acceptance of all older model microwave equipment not listed as type accepted in Part C of the Radio Equipment List. The majority of these equipments were licensed prior to July 1, 1957. The Motorola application includes all "micropackage" and "remote" units of the FSTM-30 series used on common carrier routes for both message and television service. P.E.L. 6594 advises the models requiring type acceptance which are covered in Motorola's application. Type acceptance was requested on the basis of similarity to type accepted models.

We have been informed that type acceptance has been granted for all equipment listed in the application. Since the list requiring type acceptance was derived from an actual survey of the Bell Companies, it now appears that all Motorola FSTM-30 equipments included in this list meet type acceptance requirements. We shall inform the Companies of the details in this matter by letter.

6. 2182 KC RADIOTELEPHONE ALARM SIGNAL NEWS

Amendment of the F.C.C. Rules (Parts 7 and 8) to permit use of a radiotelephone alarm signal on the safety-calling frequency was announced by P.E.L. 6554 and RADIO NOTES, October 19, 1959. As mentioned then, we still do not know how rapidly this alarm signal usage may develop. However, the Radio Technical Commission for Marine Services (RTCM) with which we are working is making some progress on a program to encourage and recommend early introduction of this feature in the United States maritime radiotelephone service.

In this connection, we thought you might be interested in the attached leaflet prepared by the Alarm Signal Ad Hoc Committee of RTCM. Members of our Mobile Radio Group are participating in the work of this committee which designed the leaflet. Many of the 50,000 copies printed in Washington were handed out at the recent New York Boat Show. Distribution

was done by the United States Power Squadron who have sent copies to their various squadrons. It is planned to make these leaflets available for future marine shows and assemblies.

Another activity of the Ad Hoc Committee has been to arrange through the Coast Guard for a tape recording of the alarm. This was used for demonstration purposes at the boat show. The Committee now is drawing up terms of reference or ground rules for a proposed RTCM Special Committee. The purpose of this special committee will be to formulate a suitable program for the introduction and expansion of 2182 kc alarm signal use in the United States.

Although we do not know of any commercially available alarm equipment in this country, the Coast Guard has a transistorized transmitting-receiving device under development. The alarm signal is on trial in certain European waters. As plans for this feature materialize, we shall keep the Companies advised.

7. 450 MC CONTROL PROVISION FOR COMMON CARRIERS

The F.C.C. proposes to amend its Domestic Public Radio Service Rules (Part 21) to restore the provision for assignment of 450-460 megacycle frequencies for control stations operating in the Domestic Public Land Mobile service and expand the use for order wire and alarm facilities used in conjunction with Point-to-Point Microwave Radio Services. Use of frequencies for control stations in the Land Mobile Service was contained in earlier rules but deleted in 1956 when the 890-940 mc frequency band became available for this use. Recent loss of the 890-940 megacycle band by non-government services prompted the F.C.C. to announce the proposed rule making.

When common carrier radio rules were revised in 1956, licensees of control stations on 450-460 mc frequencies authorized before September 4, 1956, were "grandfathered in" so that operations could continue until April 1, 1961.

The Commission pointed out that use of the 450-460 mc frequencies for control purposes may be affected to some extent by the air-ground radio-telephone operations as recently proposed by the F.C.C. Also, it was noted, that the use of the 450-460 mc frequencies for control purposes will be on a secondary basis to common carrier land mobile radio use. We plan to comment on behalf of the Bell System Companies in this rule making.

Printed in U.S.A.

8. TELEPHONE MAINTENANCE RADIO AT BUFFALO

The first telephone maintenance radio system in the Upstate New York territory of the New York Telephone Company was placed in service at Buffalo, New York on December 7, 1959. Already the system has proven itself a valuable tool in the restoration of service after a sleet storm and a major cable break.

The system operates on a two-frequency basis in the 450 mc band and is comprised of one base station, one master control, six dispatch consoles and 30 mobile units. Equipment made surplus from discontinued Private Mobile Systems is being reused for this application. The base station is arranged for retransmission of received signals to provide mobile-to-mobile operation. Good two-way communication is provided out to a range of 20 to 25 miles from the base station which is located at a height of about 220 ft. on top the Telephone Building.

The system is used primarily by construction forces for dispatching trouble crews. A few units are on trial by the district and motor vehicle repair forces to determine the field of usage in these areas. As experience is gained and the need indicated additional mobile stations and dispatch points will be added.

9. ITU PLENIPOTENTIARY CONFERENCE

The Plenipotentiary Conference of the International Telecommunication Union (ITU) (RADIO NOTES - October 19, 1959) ended December 21 with signing of a new Telecommunication Convention and Final Protocol to be known as Geneva, 1959. The Convention when ratified by member countries becomes a treaty by which they are formally bound.

The Plenipotentiary Conference is the supreme organ of the Union. In addition to responsibility for the Convention, it also reviews the organization and operations of the other bodies of the Union, which include:

The Administrative Conferences - responsible for the Telegraph, Telephone and Radio Regulations;

The International Frequency Registration Board (IFRB) - responsible for orderly use of radio frequencies on a world-wide basis;

The International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR) which deal primarily with technical questions and issue recommendations concerning them;

The Administrative Council and the General Secretariat which run the affairs of the Union between Plenipotentiary Conferences.

Some of the more interesting conclusions of the recent Plenipotentiary Conference are as follows:

1. The Administrative Council will consist of 25 instead of 18 member countries, with appropriate geographical distribution as before. In this connection an African region and an Asian and Australasian region were recognized, to cover the countries previously designated under "Other".
2. The Secretary-General and Deputy Secretary-General are henceforth to be elected by the Plenipotentiary Conference instead of the Administrative Council. Their terms will be from one Plenipotentiary Conference to the next, with the possibility of re-election.

Mr. Gerald C. Gross of the U.S.A. who has been Acting Secretary-General since the death of Dr. Andrada in 1958, was elected Secretary-General and Dr. M. B. Sarwate of India was elected Deputy Secretary-General.
3. A consolidated budget was approved. Heretofore the expenses of many meetings, including those of the CCI's (International Consultative Committees), have been separate from the general budget, and only those countries and organizations which participated in them contributed toward their cost. Now all countries, members of the Union, will contribute to all costs of the CCI's. It is thought that this may encourage participation on the part of some countries which have not previously been active in CCI work.
4. In accordance with a proposal introduced by Mexico, the CCI's were directed to study plans for a telecommunication network in Latin American countries. Previously they had studied networks in the Mediterranean Basin, Southern Asia and the Middle East, and more recently in the Far East.
5. Russian was included as a fourth language for which interpretation will be provided at ITU expense at all conferences. This should help relations with Russia, which heretofore has had to pay for its own interpretation facilities.

The following features remain substantially unchanged in spite of strong efforts on the part of some countries to change them:

1. The number of members of the IFRB (International Frequency Registration Board) and its general functions and stature were not reduced. In fact, some additional tasks were given to the IFRB by the Radio Conference, and the increase in staff necessary to perform the work satisfactorily was authorized.

2. Directors of the CCI's will continue to be elected by their Plenary Assemblies. They will, therefore, continue to be responsible primarily to their respective CCI's rather than to the Administrative Council or the Secretary-General.
3. Plenary meetings of the CCI's will continue to be held normally at 3 year intervals. A provision was added, however, that an interval of at least 8 months should elapse between a Plenary Assembly of a CCI and a corresponding Administrative Conference.

10. NEW TD-2 ROUTE

A new TD-2 route will be constructed between Salt Lake City Junction and Turquoise, California, a junction point on the Amarillo-Los Angeles route. Initially two channels will be provided in each direction for television service and protection. Additional channels between Turquoise and Los Angeles will permit feeding television service over the new route in order to release channels west of Salt Lake City for additional telephone circuits.

Applications have been made for construction permits for this 17-hop, 512-mile route. TJ microwave equipment will be launched on 6 hops of the route for order wire and alarm circuits.

11. ORGANIZATION CHANGE

Mr. A. E. Fernald (A1) has accepted the position of Special Projects Radio Engineer effective February 21, 1960. A1 is from the New England Company where he was Chief Engineer - Rhode Island.

12. RADIO INFORMATION

The following have been forwarded since the last issue of RADIO NOTES:

BSPM 703	-
BSPM 702B	-
BSPM 703A	-
BSPM 704	RL00.210, Issue 1 - Antenna Supporting Structures for VHF Point-to-Point and Mobile Service Applications AG25.100,
	AA266.073, Issue 2 - TH Radio - FM Terminal Equipment - Toll Systems



"MAYDAY, MAYDAY"

NEW NOTES
FOR THE
RADIOTELEPHONE
DISTRESS CALL

Mr. Boatowner, have you recently listened or tried to make radio contact on 2182 kc? At the same time, have you imagined your plight if you were in a distress situation needing immediate help?

We all admit it's sweet music to our ears when something is being done to make 2182 kc a better safety channel. Now real music may precede and alert your distress call of the future.

Yes, as you may know, the F.C.C. Rules, as of October 26, 1959, permit voluntary use of a two-tone radiotelephone alarm signal. We who are interested in marine radio are trying to spread the word. We also are looking at ways for making inexpensive devices available so this feature may be put into use.

You may ask "What is this alarm signal?", and "Why is it a good thing?". Indeed, these are logical questions from today's boat owner who is plagued with the costs of more and more gadgets.

First, the alarm signal consists of two audible tones. These 1300 and 2200 cycle tones are used alternately to modulate the 2182 kc transmission at the start of a distress call. The distinctive nature of the tones makes them easily distinguished on a loudspeaker and also makes them suitable for actuating automatic receiving devices.

In answer to the second question, this feature is good because it is added insurance that your distress call will be heard. Tone modulation normally gives greater transmission coverage than a voice-modulated signal from the same station. Furthermore, ship stations may readily recognize the distinctive tones through interference, and coast stations may have positive means of receiving your distress call through automatic receiving devices.

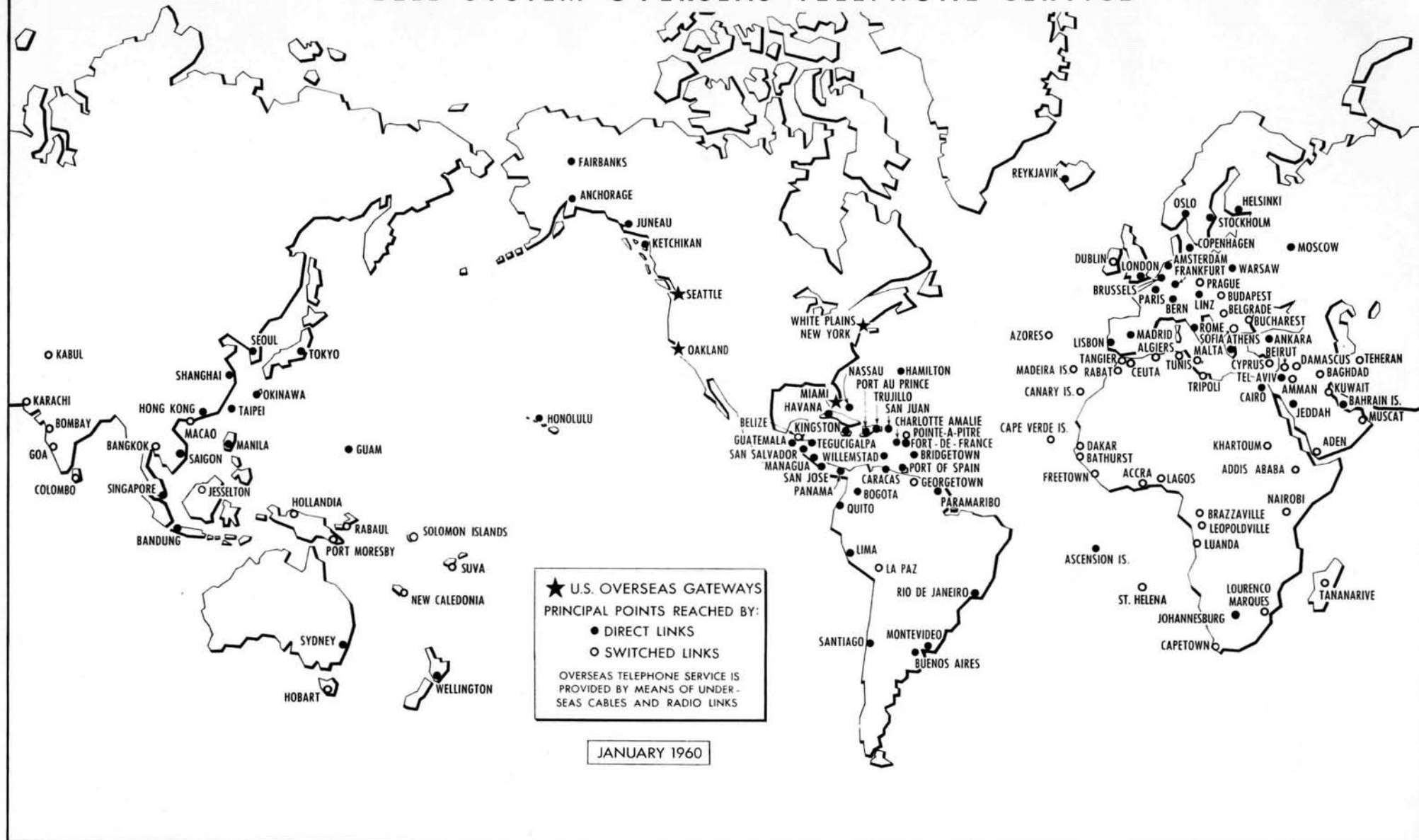
You may want to refer to Part 8 of the F.C.C. Rules for additional details. Meantime, keep your eyes and ears open for future developments.

*Your "Radio Technical Commission
for Marine Services"*

P.S. - If you're musically inclined, try playing the musical notes at the top of the page which are approximations of how the alarm signal sounds.

TCI Library- <http://www.telephonecollectors.info/>

BELL SYSTEM OVERSEAS TELEPHONE SERVICE



BELL SYSTEM TELEVISION NETWORK ROUTES

