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CP - 59-91/1

February 2, 1959

The White House

Washington

THE CABINET

The Development of a Unified Federal Civilian Communications System

The attached approved paper is circulated for action by the Director of the Office of Civil and Defense Mobilization and by the staffs of those Departments and Agencies with which the Director will be collaborating in the preparation of the comprehensive communication plan described.

This paper was approved at the Cabinet meeting of January 23, 1959 (RA - 59-125, Item 3).

Necessary minor editorial changes have been made, together with factual corrections in Attachment B.



Robert Gray  
Secretary to the Cabinet

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The Development of a Unified Federal Civilian Communications System

PROBLEM:

Should the Administration adopt and implement a policy to integrate communications systems of the various civilian federal agencies?

DISCUSSION:

1. General

Domestic communication systems utilized by and for Government agencies can be divided in three basic categories:

1. The Telephone System - may be used to transmit voice or with additional terminal equipment record communication (teletype-facsimile).
2. The Telegraph System - may be used to transmit record communications (telegraph or teletype).
3. Radio Systems - may be used to transmit voice and record communications.

The above major systems can be further subdivided as follows:

1. Public Common Carrier Systems
2. Private Leased Systems
3. Private Systems owned and operated by the agency (cies) concerned.



Most private line systems are leased from American Telephone and Telegraph Company and its subsidiaries as well as the Independent companies and Western Union. This paper concerns those private line systems leased by various non-military federal agencies.

For reference purposes telephone circuits will refer to those circuits leased from the A. T. & T. and its subsidiaries and the independent telephone companies, while telegraph circuits will refer to those circuits leased from Western Union. It is recognized that Western Union leases certain voice or telephone circuits from the Bell System. Thus a system leased from Western Union might include both "telephone" and "telegraph" circuits.

Telephone circuits are interconnected to approximately 3000 switching centers throughout the United States. Telegraph circuits are interconnected in about 126 switching centers all of which are located in major cities which are possible targets of enemy attack. Because of the greater number of switching centers with the inherent ability to restore circuits around damaged areas the telephone system is much less vulnerable to enemy attack than the telegraph system. Further, A. T. & T. has expended considerable capital in the construction of bypass routes around possible target cities. Western Union has done likewise but to a lesser extent with telegraph circuits, hence, the disparity in vulnerability is increased. A large percentage of the Western Union circuits are leased from the telephone companies and therefore share in the advantage of the bypass routes, but the location of the Western Union terminal and switching equipment (in target areas) offsets this advantage. Where a Federal agency has provided a radio backup system to the primary telephone or telegraph system, such systems are private facilities provided directly by the agency concerned. A very limited number of agencies employ such backup facilities.

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### 2. Current Federal Non-Military Systems

The existing communications systems of the various federal agencies have been designed to fulfill requirements of the parent agency with two exceptions; namely, the GSA system and the OCDM system.

The GSA system was designed to serve those federal agencies with regional offices in the field whose location and function rendered it feasible and economical. This system is leased from Western Union consisting of telegraph circuits which provide record communications but do not provide voice circuits. It is highly vulnerable to enemy attack.

The OCDM system was designed to serve the needs of the then Federal Civil Defense Administration and those federal agencies' representatives that relocated to the FCDA regional offices in an emergency.

It, likewise, is vulnerable to enemy attack but is less vulnerable than the GSA system since it is engineered over telephone circuits. Only the OCDM system is designed to interconnect political jurisdictions extending from state to OCDM region to OCDM Operational Headquarters. Systems within each state are expedients designed by each separate state assisted by OCDM. The OCDM system financed by federal funds extends from the state civil defense office to the OCDM regional office to the OCDM Operational Headquarters which is in turn connected with the Classified Location and the Federal agencies in the arc by the Interdepartmental Communication System (ICS). Some of the local systems at state level and below are financed on a 50 per cent basis by the Federal Government when the facilities are necessary for the continuity of Government.

All of the systems of the other agencies have one common feature; that is, they were designed to connect the agencies' national headquarters with their regional or district offices. (For description see Attachment B.)

While there is little or no similarity in the regional organization of the various agencies there is a marked similarity in their communication systems. A majority of the systems either terminate in or connect the following cities: Boston, Massachusetts; Washington, D. C.; Atlanta, Georgia; Dallas, Texas; Denver, Colorado; Seattle, Washington; San Francisco, California and Los Angeles, California. (See Attachment C.)

Both GSA and OCDM are currently planning improvements to their systems to render them less vulnerable to enemy attack. GSA has relocated certain major switching centers outside possible target areas and plans to proceed with this program. OCDM plans to convert its existing NACOM #1 system to full period circuits which will bypass possible target areas, and install radio backup from National Headquarters to OCDM regional headquarters and to states.

A study of the systems and the various agencies' operational and administrative requirements indicates that it is feasible to integrate most of the systems into a common system. Certain of the systems, by virtue of their complexity or of their use, would not appear on initial study to lend themselves to realignment. Examples are the C. A. A. system, the Weather Bureau system, and the F. B. I. system. This would not preclude the interconnection of these systems with an integrated system for emergency traffic. Such interconnection would be of mutual benefit to all concerned.



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The threat posed by thermonuclear war involving the continent imposes a tremendous challenge to the communications systems of the nation. The intensity and complexity of such a war will place even greater demands on the communications systems circuit capacity and flexibility of operations. Aside from the emergency traffic involving command and control basic to the prosecution of such a war and the post-attack rehabilitation requirements, three new communication demands will have to be provided for:

- a. The transmission of nuclear detonation intelligence as rapidly as possible.
- b. The transmission of damage assessment data.
- c. The transmission of radiological fallout data.

The effects of thermonuclear attacks of varying weights upon the United States have been studied. These studies reveal that there is no non-military communications system or combination of systems in being capable of fulfilling the demands that will be placed upon it immediately following even a moderate thermonuclear attack.

Existing systems are primarily deficient in two respects, namely;

- a. Circuit capacity and operational flexibility.
- b. They are vulnerable to attack (blast, thermal and radiological). Such damage will further serve to reduce circuit capacity.



The ultimate objective therefore must be the development of a system which will have adequate capacity and which will be invulnerable to attack to the extent that the system remaining after the attack will serve the emergency needs of government.

3. A Proposed National Communication System

The advanced stage of development of communication systems and related terminal equipment which has been achieved by the communication industries makes it possible to design a system utilizing equipment now in production that will fulfill the emergency requirements of non-military agencies. Such a system has been designed by the OCDM staff. The following principles were incorporated in its design:

a. Invulnerability:

Automatic switching centers capable of functioning without manual attendance and located at a safe distance from probable target areas provide the bases for circuit terminals.

b. Flexibility:

Circuit switching based on the grid system will result in the most economical use of circuits as well as provide failsafe features.

c. Circuitry:

Leased voice circuits would be utilized, providing record as well as voice communications. Since most of the circuits would consist of microwave which is less vulnerable than wire, invulnerability would be enhanced. Multi-channel leasing would make possible cheaper rates.

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d. Common Usage:

To reduce the message rate cost of such a system, common usage of communication facilities and equipment by all civil agencies of government is mandatory. It is recognized that various agencies will have specific operational requirements for communications requiring individual systems, as well as connections to the common integrated system. It is necessary that these requirements be met by a maximum common usage of the integrated system.

e. Economy:

The cost of such a system is high and cannot be justified on the basis of a system for use by a single agency or by all agencies only in emergencies, but can be readily defended if the system is designed to serve normal needs of all non-military federal agencies as well as to provide effective means of communications in an emergency.

f. Interconnection to Military Systems:

The system will be compatible with, and have the capability of, interconnection with appropriate present and proposed military systems.

It is recognized that any agency would be reluctant to concur with any plans that would result in that agency's losing control of its communications. Such is not necessary nor is it envisioned in the design of the system. The ultimate system would provide a common arterial trunk connecting national and regional headquarters. Terminal equipment would be in the custody of and controlled by the parent agency.

Should such a system be authorized for implementation approximately three years would elapse after funds were made available before the system would be operational. Therefore, interim measures should be considered.

4. Interim Measures to Improve Communications

The existing communication systems can be rendered more efficient and less vulnerable to enemy attack by certain measures which are relatively inexpensive and which can be rapidly implemented.

- a. Current plans for improvement of OCDM and GSA systems for which funds are being sought in the FY 1960 budget request should proceed on schedule.
- b. Existing systems should be interconnected both at national and regional level where feasible. OCDM is completing arrangements at this time to interconnect with the Weather Bureau system, the FCC system, and the Army ACAN system at regional level. Interconnection provides alternate routes to be used in emergencies which increases the chances of transmitting a message to its destination.
- c. Standardized procedures, standardized reporting forms, instruction in message format and other such measures can serve to reduce the volume of traffic existing systems will have to carry.
- d. The use of high speed terminal equipment and transmission techniques can increase the over-all capacity of a system many times. (600 words per minute teletype versus the present 60 or 75 wpm.) Each agency should study its projected emergency requirements with a view toward utilizing such improved techniques and equipment in order to obtain the utmost service from the least possible number of circuits.

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5. Responsibility

A communication plan of the scope envisioned by this paper must have central direction if it is to result in an integrated unit. It is considered appropriate that the Director of the Office of Civil and Defense Mobilization be responsible for preparing and submitting for approval a comprehensive National Communication Plan.

RECOMMENDATIONS:

1. It shall be the policy of the United States Government to integrate and unify the various Federal civilian agency communications systems to the extent that there will be provided a suitable national intercommunication capability among offices including field offices, of the Federal Government agencies during a national emergency, and further to the extent that this unification shall provide, in a manner consistent with reasonable economics, a peacetime capability sufficient to enable the agencies of the Federal Government to discharge their normal responsibilities.
2. Implementation of the above statement of policy shall be contingent upon the preparation and approval of a comprehensive communication plan as described in "IMPLEMENTATION" below.
3. In order that the competence of industry may be utilized to the fullest extent, the practice of using leased communication services will be continued by the Government in the implementation of the foregoing policy under paragraph 1 above excepting where security measures dictate to the contrary.

IMPLEMENTATION:

1. That the Director of OCDM working with the appropriate agencies will prepare for Cabinet consideration by June 1, 1959 a comprehensive communication plan. This plan will include, but not necessarily be limited to:
  - a. Interim measures to improve the emergency operational communication capability of the Government.
  - b. A proposed National Communication System (including extensions to the territories) incorporating the requirements specified herein.
  - c. Preliminary fiscal cost estimates for the initial installation and subsequent annual recurring charges.
  - d. The time phasing of the implementation of the interim plan and final plan.
2. At the appropriate time the Government will solicit industry participation in the construction and operation of the system.
3. Subject to action taken on item one above, detailed budget estimates for appropriation of funds necessary to implement the system (s) and provide for its continued use will be requested.
4. If required, necessary legislation will be prepared and submitted to the Congress through appropriate channels to provide the authorities necessary to administer the program.

ATTACHMENTS:

- A. Recommendation H of Cabinet Evaluation dated October 9, 1958.
- B. Summation of types of existing communication systems of Federal agencies.
- C. Summation of major points of termination of existing Federal agency communication systems

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Attachment "A"

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OPERATION ALERT 1958

Cabinet Evaluation, October 9, 1958

Based on the conclusions presented in the Report of the Round Table Discussion and Seminar Group Reports, and on the Report of the Operational Capability Task Group, the following recommendations are offered for the concurrence of the Cabinet:

- H. That the various, separate Federal civilian agency communications systems be studied to ascertain the extent to which they can be unified in order best to serve over-all emergency needs; that the Director of OCDM, working with the interested agencies, prepare for Cabinet consideration by January 1, 1959, an interim Report which would propose a statement of national policy and which would propose methods for implementation of this policy.

**ACTION:**

Recommendation H was approved, it being understood that the serious questions which this study will raise will be given the most careful consideration.



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Summation of Types of Existing Communications Systems of Federal Agencies

1. Department of Agriculture

- a. Market News Leased Service to 123 Field Offices Teletypewriter
- b. Commodity Credit Leased Service to 11 Field Offices Teletypewriter
- Additional Communications Facilities GSA Telephone  
GSA Teletypewriter  
TWX  
Western Union  
Commercial Telephone

2. Atomic Energy Commission

- To 8 Field Offices Leased Telephone
- Additional Communications Facilities TWX  
TELEX - Teletypewriter  
Army ACAN  
Western Union  
Government HF Radio
- Backup for Emergency Operation

3. Central Intelligence Agency

- To Field Offices GSA Telephone  
GSA Teletypewriter  
TWX  
Army ACAN  
Western Union
- State and Other Government Agency Networks Commercial Telephone



4. Civil Service Commission

- To Regional Offices GSA Telephone  
GSA Teletypewriter  
Western Union  
TWX  
Commercial Telephone

5. Department of Commerce

- To Field Offices GSA Telephone  
GSA Teletypewriter  
Western Union  
TWX  
Commercial Telephone
- a. Weather Bureau
- To Field Offices 75 WPM Teletypewriter
- Connections to Armed Forces System Teletypewriter
- Connections to FAA Weather Network Teletypewriter

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b. Federal Aviation Agency

- (1) Service A \* Teletypewriter  
458 FAA send-receive, and  
38 Military send-receive drops,  
1600 receive-only drops, 48,839  
miles circuits (A.T.&T.)
  - (2) Service B \* Teletypewriter  
544 send-receive drops  
44,360 miles leased circuitry -  
A.T.&T. and Western Union
  - (3) Service C \* Teletypewriter  
200 FAA send-receive  
400 receive-only civil and military  
drops, 23,622 miles leased  
circuitry - Western Union
  - (4) Service F Leased Full Period Voice  
6,000 send-receive drops to civil  
and military stations  
135,000 miles leased circuitry -  
A.T.&T
  - (5) Service O \* Teletypewriter  
24 FAA send-receive and 220  
receive-only civil and military  
drops, 14,072 miles leased circuitry -  
A.T.&T.
  - (6) GSA, TWX and Commercial cable lines are used extensively  
for the handling of administrative traffic which is restricted  
from operational circuits.
- (\* All send-receive drops Government owned equipment.



6. Federal Bureau of Investigation

To 47 Field Offices	Leased Line	Teletypewriter
Emergency Communications System		Radio Telegraph

7. Federal Deposit Insurance Corporation

To Regional Offices	Western Union
	Commercial Telephone
	TWX

8. Federal Home Loan Bank Board

To Field Offices	GSA	Teletypewriter
		Western Union
	Commercial Telephone	
		TWX

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9. Federal Power Commission

To Field Offices

GSA Teletypewriter  
Western Union  
Commercial Telephone  
TWX

10. Federal Reserve Board

To 37 Field Offices

A T & T Leased Teletype

Additional Communications  
Facilities

GSA Teletypewriter  
Western Union  
Commercial Telephone  
TWX

11. General Services Administration

To 57 Field Offices

Leased Teletypewriter  
Leased Telephone

12. Department of Health, Education, and Welfare

To Field Offices

GSA Teletypewriter  
Telephone  
Western Union  
Commercial Telephone  
TWX



13. Housing and Home Finance Agency

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone

14. Department of Interior

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone  
TWX

Limited Local Facilities  
Limited Facilities

Government Mobile Radio  
Government Microwave

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15. International Cooperation Administration

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone  
TWX

Utilizes State Department Facilities to Overseas

16. Interstate Commerce Commission

To Field Offices, Leased Lines

Commercial Telephone

GSA Teletypewriter  
GSA Telephone  
Western Union

17. Department of Justice

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone

Limited Facilities, Gov't HF Radio to Border Areas  
Limited Facilities, Local Police Networks

18. Department of Labor

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone  
TWX

19. Department of Post Office

To Field Offices

GSA Teletypewriter  
GSA Telephone  
Western Union  
Commercial Telephone  
TWX



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20. Selective Service System

To Field Offices	GSA Teletypewriter
	GSA Telephone
	Western Union
	Commercial Telephone
To 62 Field Offices	Crypto System
Utilizes Commercial Refile and Army - ACAN	

21. Department of State

Communications Facilities to Field Offices

In the United States	GSA Teletypewriter
	GSA Telephone
	Western Union
	Commercial Telephone
	TELEX-Teletypewriter
	TWX

To Mexico and Havana	Leased Teletypewriter
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Connections to Overseas Radio



22. Veterans Administration

Communications Facilities	
To 250 Field Offices	Leased Teletypewriter
	TWX

7 Small Area Systems Connecting into Army - ACAN

GSA Teletypewriter
GSA Telephone
Western Union
Commercial Telephone

23. American National Red Cross

To 245 Field Offices	Leased Teletypewriter
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Western Union
Commercial Telephone
TWX

24. Federal Communications Commission

To 19 Field Offices	Radio - Telegraph
	Leased Teletypewriter

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25. Office of Civil and Defense Mobilization

a. NAWAS

To 276 Warning Points

Leased Telephone

b. NACOM I

To 58 Regional and State  
Offices

Leased Teletypewriter  
Leased Telephone

c. NACOM II

To 56 Regional and State  
Offices

Gov't HF Radio

d. RACES

To Areas, Counties and  
Municipalities

Amateur Radio

e. Additional Communications  
Facilities

Western Union  
TWX  
Commercial Telephone



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ATTACHMENT "C"

SUMMARY OF MAJOR POINTS OF TERMINATION OF EXISTING FEDERAL  
AGENCY COMMUNICATION SYSTEMS

	Washington, D. C.	Boston, Mass.	Atlanta, Ga.	Dallas, Texas	Denver, Colo.	San Francisco, California	Chicago, Illinois	Seattle Wash.
American National Red Cross	X	X	X	X	X	X	X	X
Atomic Energy Commission	X	X	X	X	X	X	X	X
Department of Agriculture	X	X	X	X	X	X	X	X
Dept. of Commerce Federal Airways	X	X	X	X	X	X	X	X
Federal Aeronautics Authority Syc. C.	X	X	X	X	X	X	X	X
Federal Aeronautics Authority Syc. A.	X	X	X	X	X	X	X	X
Federal Bureau of Investigation	X	X	X	X	X	X	X	X
Federal Communications Commission	X	X	X	X	X	X	X	X
Federal Reserve Board	X	X	X	X	X	X	X	X
General Services Administration	X	X	X	X	X	X	X	X
OCDI - Code and Tie Line	X	X	X	X	X	X	X	X
OCDI - DEJNET	X	X	X	X	X	X	X	X
OCDI - NACOM	X	X	X	X	X	X	X	X
OCDI - HAMES	X	X	X	X	X	X	X	X
Veterans Administration	X	X	X	X	X	X	X	X
Weather Bureau	X	X	X	X	X	X	X	X

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