PRIVATE LINE SERVICE - TELEGRAPH

DEPARTMENT OF COMMERCE -

CIVIL AERONAUTICS ADMINISTRATION

ORGANIZATION AND SPECIAL FEATURES ASSOCIATED WITH THE CUSTOMER'S TELETYPEWRITER SERVICES AND STATION EQUIPMENT

1. GENERAL

1.01 This appendix is issued for the purpose of incorporating matters related to the CAA organizational structure and general information pertaining to special features associated with CAA Teletypewriter Services and Station Equipment into one appendix in an outline form only. Complete details may be obtained from Section E12.758 Appendix 1 if such information is required.

2. CIRCUIT GROUPINGS

2.01 The CAA circuits are divided by the customer into 3 groups in accordance with the nature of the traffic handled. One group is known as the "Service A" network which primarily handles hourly weather information. The second group, known as the "Service B" network handles aircraft movement and traffic control information, while the third group, known as "Service O," handles weather information of a selective nature, principally from outside of the United States.

3. CAA ORGANIZATION

3.01 For supervisory reasons, the CAA field organization in the United States consists of 7 regions with the administrative and staff organization being located in Washington, D.C. Attachment 1

of this appendix shows the territory of Regional Areas 1 to 7, inclusive, as well as the location of the Regional Headquarters.

3.02 There are CAA Washington and Regional Offices representatives who periodically visit CAA stations throughout the country for inspection and supervisory purposes. These people in the course of their normal work assignment will have occasion to contact Telephone Company serving testrooms or maintenance personnel.

3.03 Actual maintenance of CAA teletypewriter equipment is performed by Maintenance Technicians, each of the larger stations having one or more Technicians assigned to the station. The smaller stations are geographically grouped within a sector, and a Maintenance Technician is assigned to each such sector. These Maintenance Technicians will contact the Telephone Company serving testrooms in connection with the performance of their normal routine maintenance tests.

3.04 CAA Aircraft Communicators handle the actual operation of the teletypewriter equipment and, therefore, the greater number of reports of circuit irregularities will be made to the testrooms by them.

4. SPECIAL FEATURES ASSOCIATED WITH CAA TELETYPEWRITER SERVICES AND STATION EQUIPMENT

(A) Automatic Station Identification Device

4.01 The CAA has provided automatic station identification devices associated with standard transmitter-distributors at their stations on all networks. These devices are normally referred to by the CAA as the "ASID." The "ASID" automatically transmits one of the four following patterns:

(1) LETTERS (Station Identification) Space
(2) LETTERS (CR) (LF) (Station Identification) Space
(3) LETTERS (CR) (LF) (Station Identification) Figures Space
(4) (CR) (LF) LETTERS (Station Identification) Space

4.02 Transmission of any one of the above patterns is automatically accomplished by means of a relay character circuit within the "ASID" and signals produced by this equipment are transmitted directly into the line. The "ASID" equipment is so arranged, whereby, upon completion of its transmission, the transmitter-distributor associated with the "ASID" will automatically cut in and transmit the remaining message text.

(B) Automatic Message Diversion Equipment

4.03 The CAA has provided an Automatic Message Diversion System, normally referred to as the "MEDIS" at seven major relay centers on the Service "A" network.

These centers are located at Atlanta, Cleveland, Denver, Ft. Worth, Kansas City, New York and Salt Lake City. This system automatically selects the sequence weather reports received at the relay center and diverts them to the proper outgoing operating position.

(C) Sequential Control Equipment

4.04 The CAA has provided Sequential Control Equipment, normally referred to as "SECO," on three of the Service "A" network circuits 8002, 8004 and 8005. Eventually all Service "A" circuits will be equipped with the "SECO" apparatus. This equipment provides for the automatic sequence collection of weather report messages from the various secondary "SECO" Stations on the circuit under the control of a Master Primary "SECO" Station. Where this equipment is provided, the sequence combinations described in (A) covering the "ASID" equipment are inserted automatically by the "SECO" apparatus. In addition, an end of transmission signal consisting of (FIGURES) (CR) (LETTERS) is inserted at the end of a transmission at a given station.

"SECO" equipment may be operated either on an automatic or manual basis and when operated manually, the station identification selections are sent locally by the "ASID" equipment previously described.

Where "SECO" equipment is provided, circuits are normally operated on an automatic basis during the sequential collection of weather reports and on a manual basis for all other transmission.

4.05 One primary "SECO" station is capable of controlling the transmissions of 75 secondary stations on its circuit. Each set of primary "SECO" equipment is so designed that it will stop the operation of the equipment whenever the line runs open for a period of 170 milliseconds or longer and operate an audible and visual signal at the station sending to call the operator's attention to the open line condition.

(D) Push Key Cabinet

4.06 The CAA provides a "Push Key Cabinet" instead of the usual loop jack switchboard at most of their stations, for switching teletypewriters between different loops. Although owned, operated and maintained by the customer, trouble in the board may affect the circuits; therefore, knowledge of the boards' characteristics and operation is of value to the maintenance personnel.

Two general types are provided: a twenty key cabinet for rack mounting and a six key arrangement in a metal cabinet. Detailed information is ccvered in Appendix 8 of this Section.

Attached:
Attachment #1 - 1 Page

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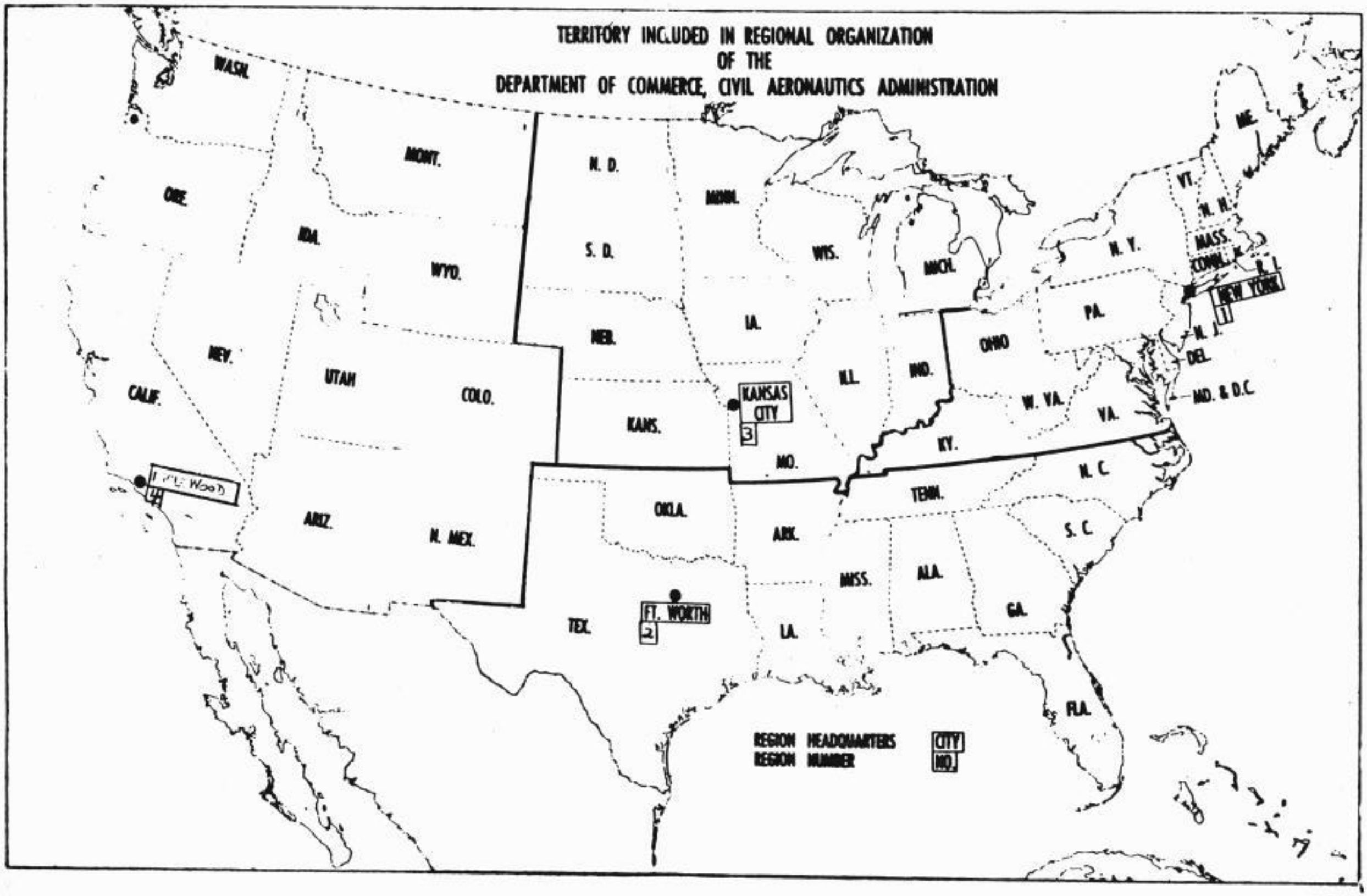

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Attachment #1 TELEGRAPH
Page 1A

PRIVATE LINE SERVICE-TELEGRAPH

DEPARTMENT OF COMMERCE -

CIVIL AERONAUTICS ADMINISTRATION

TELEGRAPH TERMINAL APPARATUS, ARRANGEMENT,

INSTALLATION AND EQUIPMENT HOUSING

1. GENERAL

1.00 This issue supersedes Issue A in its entirety. This Appendix is reissued for the purpose of including matters pertaining to the arrangement, installation and housing of telegraph terminal apparatus in CAA stations, which was formerly contained in Appendix 7. The information formerly outlined in Appendix 2 relating to the provision of a demarcation strip for the purpose of providing a dividing line between circuits and equipment of the Telephone Company and circuits and equipment of the CAA, now appears in Appendix 5.

1.01 This appendix describes the telegraph apparatus cabinet arrangements required for the installation at CAA stations.

1.02 All Telephone Company owned telegraph terminating apparatus installed at a CAA station shall be housed in a floor mounted, inclosed metal cabinet or standard open type relay rack in accordance with the rules and regulations governing CAA station installations as outlined in Appendix 5 of this Section.

1.03 The type and amount of telegraph apparatus to be provided at a given CAA station varies considerable depending upon the method of circuit operation used, the number of circuits involved, the requirement for receiving only extension service and other factors. The choice of a cabinet or relay rack to mount this terminal apparatus is therefore dependent upon local requirements and a knowledge of local conditions at each station. The requirements for a particular station should be accordingly determined locally and the installation made under the general supervision of the field forces concerned.

1.04 In the selection of a cabinet or cabinets consideration should be given to providing the next larger size cabinet rather than providing two or more of the smaller cabinets.

All cabinets selected for a given installation shall be finished in a color similar or equal to the standard Gray-Green Winkle Finish. Items constructed of wood, such as the base of mounting cabinets on the floor shall be finished in a color similar or equal to the Gray-Green Smooth Finish.

1.05 Whenever possible both telephone and telegraph terminating equipment should be installed in a common cabinet to conserve floor space and reduce overall costs. Where the Long Lines provides the telegraph equipment for its services, telephone equipment used with an Associated or Connecting Company Service "F" interphone network or other local service may be installed in spare space in the Long Lines cabinet. However, the Long Lines should not make space available by providing a cabinet larger than necessary for its telegraph requirements. In cases where spare space is not available in a Long Lines cabinet, but use of a larger common cabinet is feasible, mutually agreeable arrangements for joint use should be made, if possible, by the Long Lines and the Associated or Connecting Company concerned.

1.06 Mounting arrangements have been developed for the various types of telegraph auxiliary equipment in apparatus cabinets and are covered later in this appendix. In general, these arrangements have been so designed as to be interchangeable between the various types of cabinets available and except for the heavier and more bulky apparatus such as 128B2 subscriber sets and rectifiers, the units are mounted on standard 19 or 23 inch mounting plates.

2. CABINETS

2.01 Cabinets in four different sizes are available for housing the telegraph terminal apparatus. These cabinets will be referred to as A, B, C and D and have dimensions as follows:

Cabinet	Inches Deep	Inches Wide	Inches High	Mounting Plate Spaces
A	11	22	12	4
B	11	26-1/4	23-1/8	11
C	11	26-1/4	35-1/4	18
D	17	26-1/4	84	45

2.02 The A, B and C cabinets have swinging gates upon which the apparatus is mounted, thereby giving access to both sides of the equipment. The A cabinet is designed for 19 inch mounting plates, and in this application 19 inch plates are normally used with the B and C types. When the D cabinet is used, additional floor space is required to permit access to both front and rear. It is designed for 23 inch mounting plates but can be arranged to handle 19 inch as well. A wooden baseboard is available for mounting cabinets B and C on the floor. A metal stand 3 feet high is also available for mounting the A and B cabinets.

3. APPARATUS

3.01 Line Test Jack Unit. A line test jack unit shall be provided at each station with one of the above cabinets. This unit is provided to

expedite testing and to permit interchange of conductors. In the past a demarcation strip was also furnished as a part of this unit, however, in accordance with arrangements covered in Appendix 5 of this section, a demarcation strip is now furnished by the CAA and is mounted externally to the Telephone Company cabinets. The terminal strip mounted on the Line Test Jack unit will no longer be required or furnished for future installations. Wiring information omitting this strip is covered in new sections listed later in this Appendix. Existing installations need not be modified to agree with the new wiring information.

3.02 Wave Shaping Equipment. Wave shaping equipment should be provided in accordance with standard practices, except that the units that make up the equipment should be mounted as covered in new Bell System Sections listed later in this appendix.

3.03 13Z1 and 13Z2 Repeaters. Information on the 13Z1 and 13Z2 repeaters is covered later in this appendix. The 13Z1 repeater should not be used in future CAA installations.

3.04 Rectifiers. On the provision of rectifiers some thought should be given to providing adequate reserve for both protection, future growth and economy of operation. In general, where one or two circuits are involved individual .200 ampere rectifiers should be provided for each circuit, however, in larger offices consideration should be given to the provision of larger rectifiers depending upon local requirements.

3.05 128-B-2 Subscriber Set. Only the C and D cabinets have sufficient space for housing the 128-B-2 set. The "C" cabinet can house 2 complete units including rectifiers, as illustrated in Figures 3 and 4 of Attachment 1. Four complete units may be mounted in the D cabinet. When the D cabinet is used provision for sufficient floor space to permit access to both the front and rear must be arranged. Ordering, assembly and wiring information is covered later in this appendix.

At the time of issuance of this appendix, to avoid relay troubles with the 128-B-2 set when used in conjunction with the KS-5663 List 4 or 5 rectifier, it is necessary to modify the 128-B-2 set in accordance with drawing SD-70220-01 Issue 8-B or later.

4. INSTALLATION

4.01 The circuits of the CAA operate on a 24 hour basis with a release period daily as covered in Bell System Practices Section E12.758, Appendix 4. In placing the equipment in service it will be necessary to plan the work so that service is not interrupted. Lack of space at most CAA stations necessitates assembling and wiring the equipment and cabinets on Telephone Company premises and moving and placing it in the CAA station as a complete unit. The Telephone Company shall be responsible for making proper arrangements with the CAA to select a mutually satisfactory location for the equipment and for its installation and placing in service.

It is expected that 2 trips to the CAA station will be required, the first to determine a mutually satisfactory location for the equipment and the second to actually install it. The CAA Regional Office will arrange for a representative of the CAA to accompany the Telephone Company representative in choosing the equipment location. He will also arrange for any work that has to be done by the CAA in connection with the installation project.

4.02 Aside from the factors mentioned heretofore in connection with the selection of the proper type of apparatus cabinet, future growth at a given station should be considered in order to avoid the necessity of replacing the cabinet at some future date with a larger unit. In this connection the type of station and its location determine the probability of future growth. A weather observing station at a remote location without a landing field probably will never employ a 13Z type receiving only extension repeater and is not likely to have much circuit growth. It does not appear advisable to choose a cabinet for such locations much in excess of present requirements. A station at a commercial airport, however,

may expect future growth, particularly in extension service. This possibility should be given weight in choosing the cabinet.

4.03 The apparatus cabinet or cabinets shall be installed in the CAA station in accordance with the rules and regulations governing installations at CAA stations as outlined in Appendix 5 of this section.

The cabinet shall be so located that it is not subjected to avoidable physical hazards such as under open windows, against radiators or other heating appliances etc. The location selected must be mutually agreeable to the CAA and to the Telephone Company.

4.04 In connection with installations at new CAA Type "S" Watch Houses, the equipment protection cabinet and apparatus cabinet locations as well as the conduit runs as shown on the current CAA Drawing D-21175 which may be seen at the CAA station involved, shall be utilized for all Telephone Company wiring and apparatus.

4.05 Wiring between the cabinet and the entrance terminal box shall be shielded by conduit, lead covered cable or other shields to reduce to a minimum interference to the CAA high gain short wave radio receivers. The CAA has agreed that the wiring which they provide between their "Demarcation Strip" and equipment will also be suitably shielded.

Standard practices shall be followed for wiring the equipment in the cabinet. All power wiring and fittings shall meet the standard underwriters requirements and local electrical codes.

4.06 All equipment in the cabinet shall be identified by stencil markings, designations or other suitable means. A schematic and wiring drawing shall be prepared to cover any apparatus or wiring installed but not covered by BSP Sections specified herein. At least one copy of all such drawings or BSP sections shall be kept in the cabinet and kept up to date at all times in sufficient detail to enable any maintenance men or installer to locate and identify all apparatus and wiring.

5. REFERENCES

5.01 The following information is provided for use as required:

Subject	BSP Section or Drawing	
Cabinet A	AA381.315	ED-91472-01
Cabinet B	AA381.315	ED-91194-01
Cabinet C	AA381.315	ED-91180-01
Cabinet D		ED-91981-01
128-B-2	P31.240	SD-70220-01
	P95.001	
* 13-Z-1	P31.917	20295-T-113
	P30.908 App. 4	20295-SD-124
13-Z-2	P31.917	20480-T-113
	P30.908 App. 4	20480-SD-124
Two 128-B-2 in C Cabinet	P91.931	
Two 128-B-2 in D cabinet	P31.936	
Wave shapers, Line Jack Unit, etc.	P91.930	

* Should not be used for future installations.

Attached
Attachment #1 - 6 pages

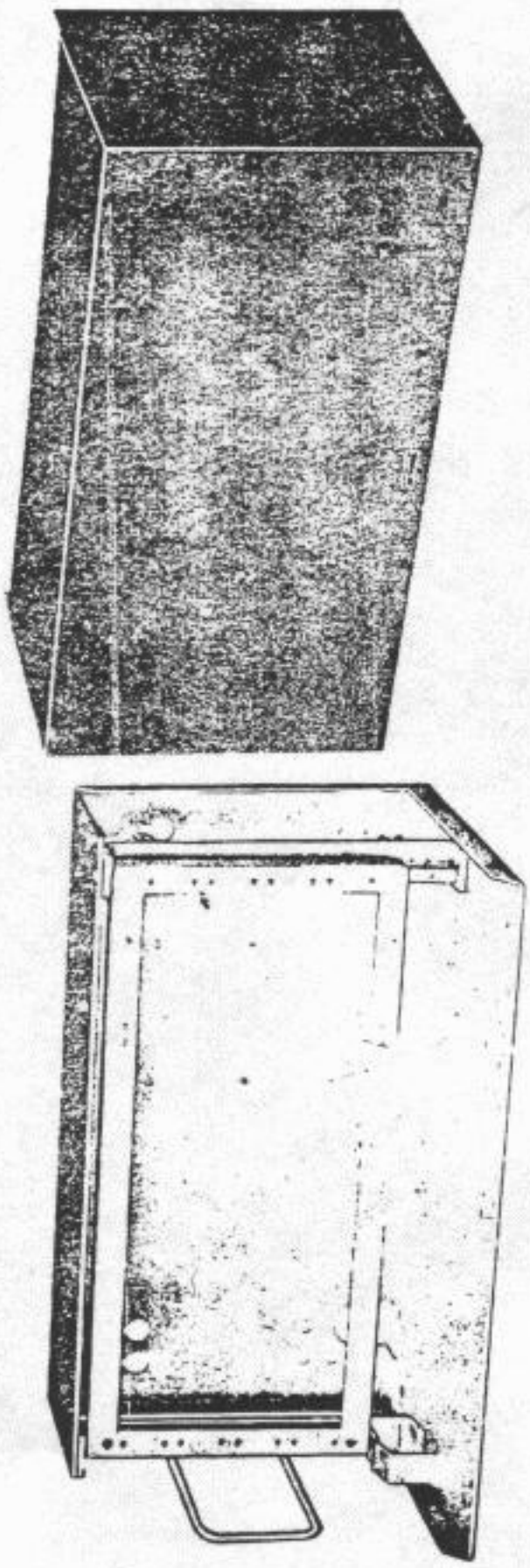

Fig. 1-4 Plate Cabinet Type A-Cover Removed

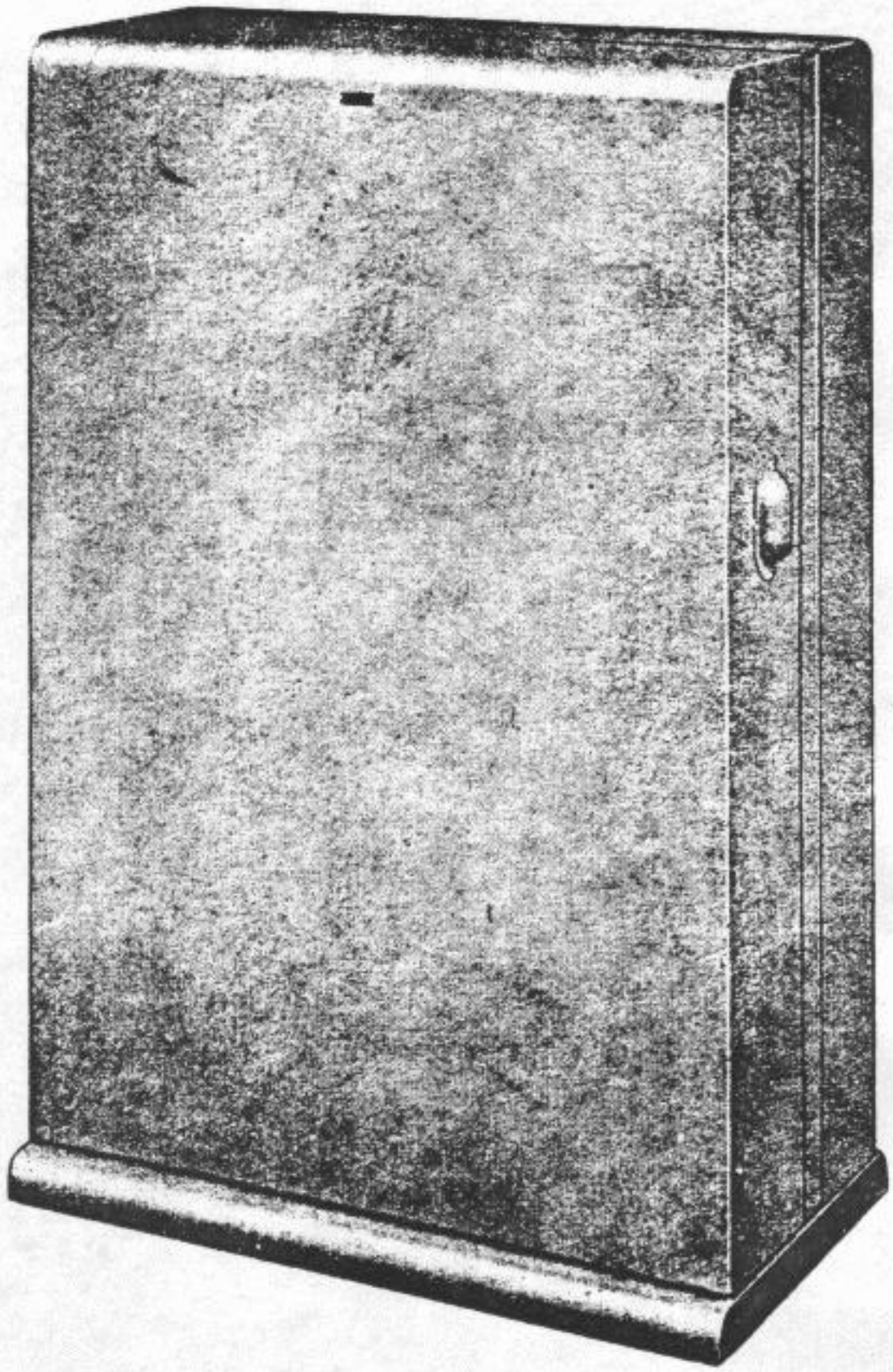

Fig. 2-18 Plate Cabinet, Type C

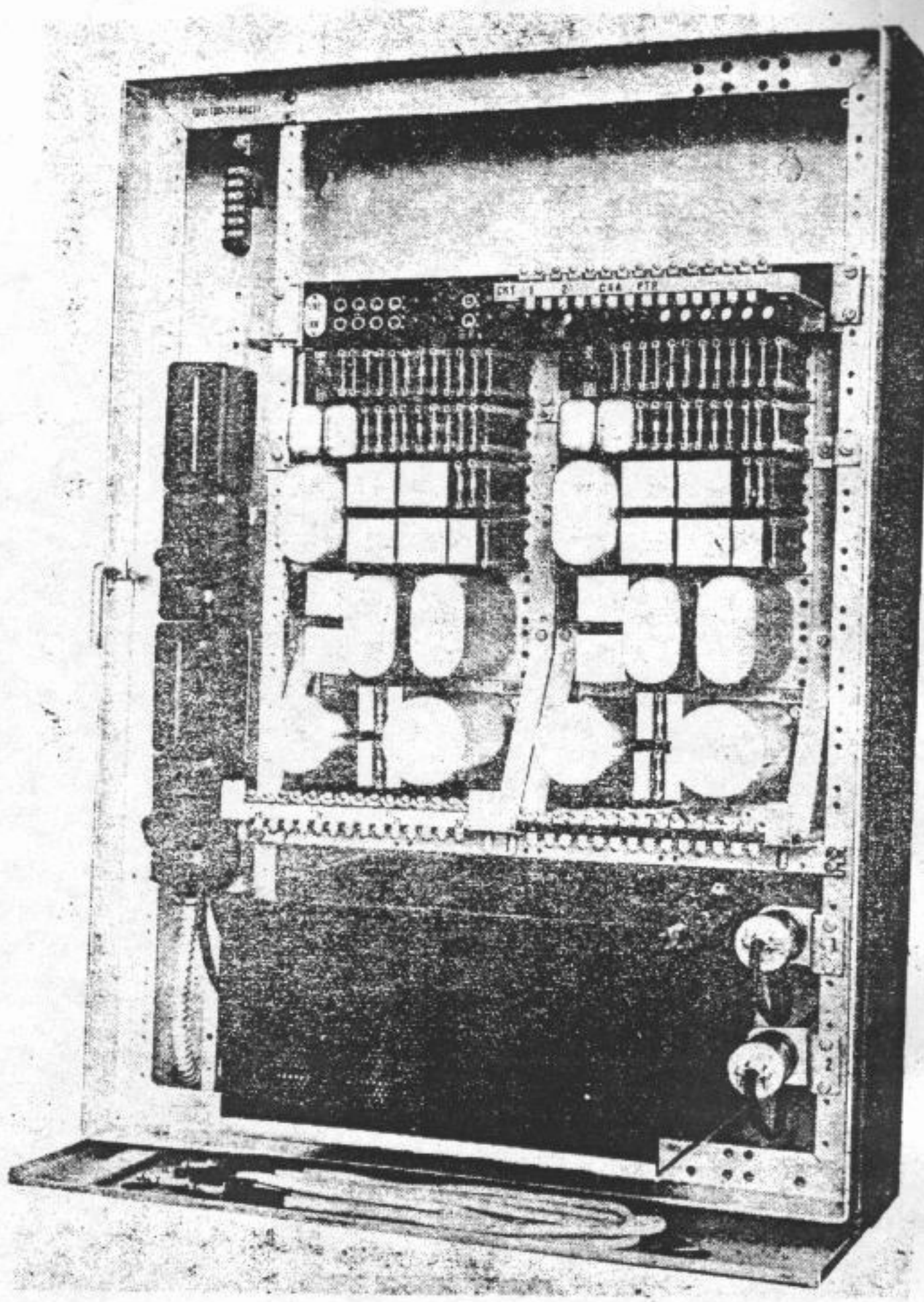

Fig. 3 - Typical Installation of 18 Plate Cabinet Type "C" with Gate Closed

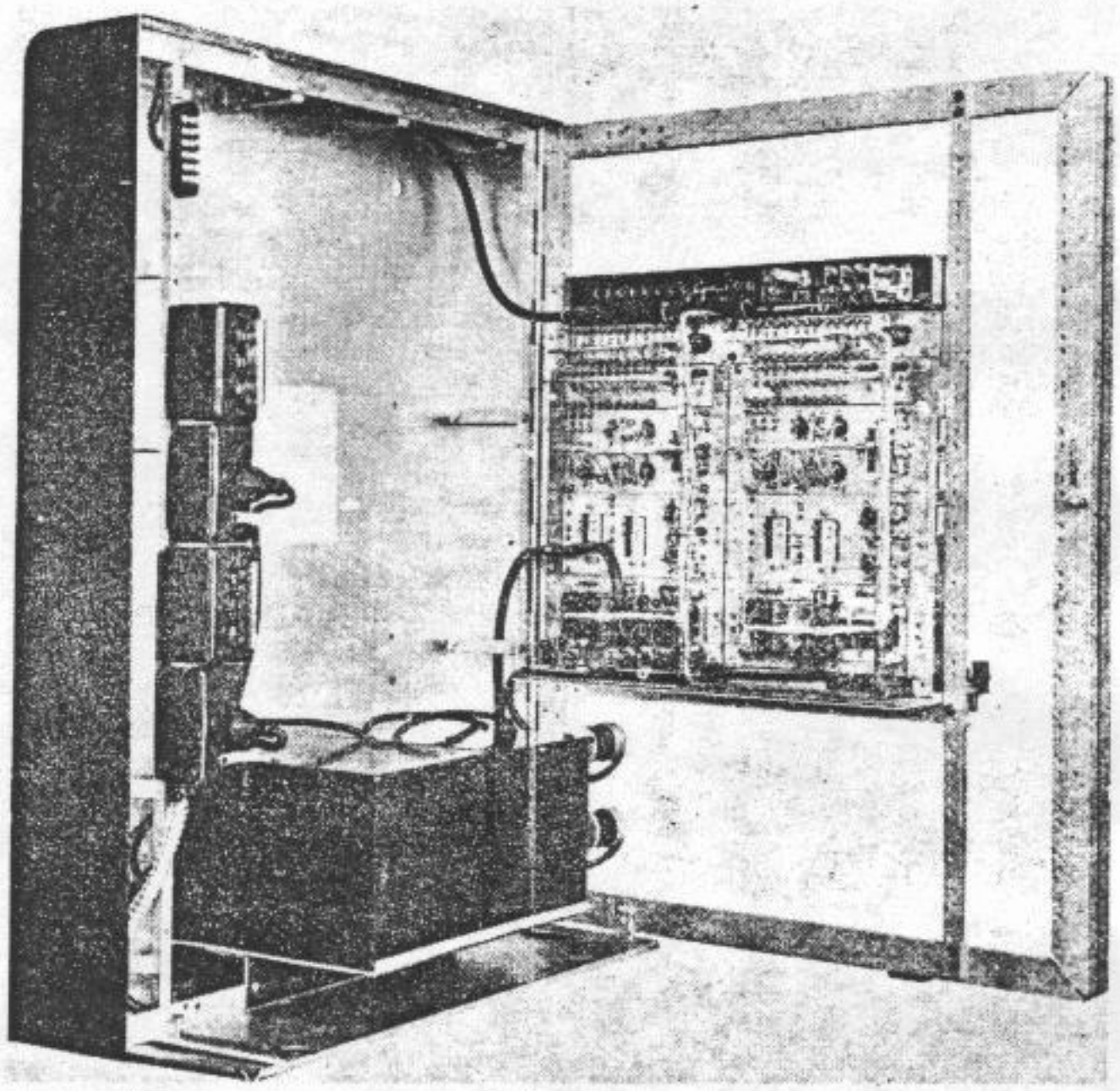

Fig. 4 - Typical Installation of 18 Plate Cabinet Type "C" with Gate Open

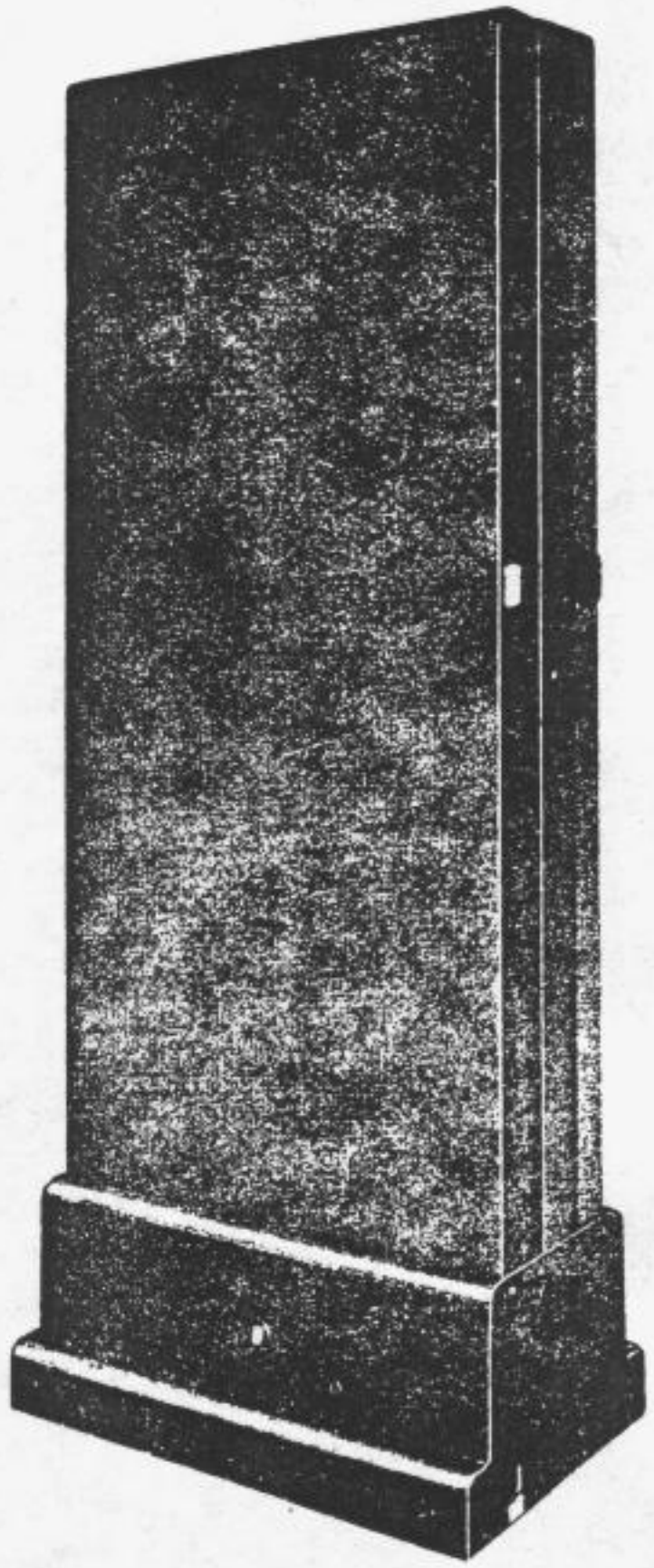

Fig. 5 - Formerly Known as "D" Cabinet.
Replaced by Cabinet shown in Figure 6.

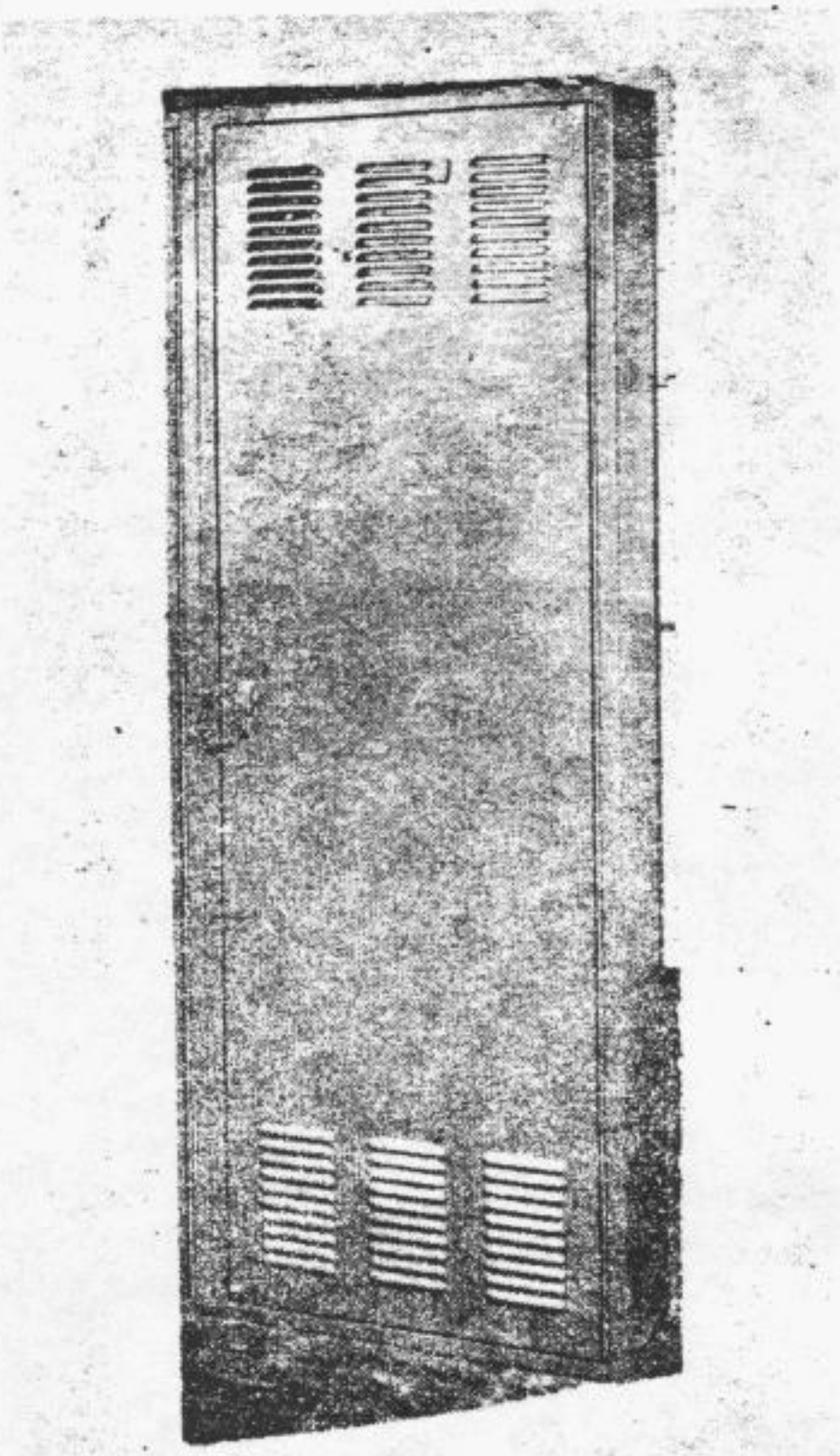

Fig. 6 - "D" Cabinet

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PRIVATE LINE SERVICE - TELEGRAPH

DEPARTMENT OF COMMERCE, CIVIL AERONAUTICS

ADMINISTRATION HANDLING SERVICE MATTERS BETWEEN

CIVIL AERONAUTICS ADMINISTRATION AND

TELEPHONE COMPANY PERSONNEL

1. GENERAL

1.01 This issue supersedes Issue A in its entirety. It is reissued to remove information concerning the CAA organization, now covered elsewhere in this section, but to include additional data on the handling of service matters between CAA and Telephone Company personnel.

1.02 A definite plan for handling of service matters has been agreed upon by the two organizations. This is covered in detail in Bell System Practices, Section E12.758, Appendix 3, Long Lines department.

1.03 Under this plan, the testroom is responsible for all details connected with normal day to day problems involving interruptions, transmission, etc.

1.04 In order that the testroom may fulfill its responsibility under the agreement, no work shall be attempted at the station by Telephone Company personnel until the serving testroom has been notified and has given permission to proceed with such work.

2. CAA CIRCUIT RESPONSIBILITY

2.01 The individual CAA station personnel is responsible for the proper operation of the station, for notifying the CAA control office if the station is going off the circuit, for reporting troubles to our testrooms, etc.

2.02 If a station is to be taken out of service momentarily and where it will not affect the operation of the circuit, the CAA personnel will not notify our testroom people. In the event the station is going to be out of service for some time or where its removal might interrupt the circuit, the CAA personnel will notify the serving testroom and will request that the station be disconnected. In either case, the station will transmit a circuit notification "TYPNO" message to inform all subscribers that it is going off the circuit. When it returns to the circuit, it will transmit a similar type of message in which "TYPOK" will be shown, indicating that the station is back on the circuit.

Note: "TYPNO" is generally understood to mean "teletype facility not operative" and "TYPOK" to mean "teletype facility operative."

2.03 Circuit interruptions originating at CAA stations and which cannot be reported over the circuit by that station, if practicable, shall be reported to the serving testrooms by other means.

2.04 In addition to the CAA station personnel as discussed in Paragraph 2.01, there are Regional and Washington office representatives who periodically visit the CAA stations for inspection purposes. Any installation or service irregularities observed will be referred by them to the connecting testroom in the same manner as for the station personnel.

3. PROCEDURE

3.01 The Civil Aeronautics Administration's personnel at all CAA Communication stations and the Telephone Company's personnel at the testroom

connecting the CAA office involved to the circuit, will handle all matters pertaining to the operation of the service among themselves so far as is practicable.

3.02 If a service situation cannot be settled to the mutual satisfaction of the personnel of both organizations, as described in 3.01, the personnel involved shall so notify the other that he is referring the matter to a higher level.

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PRIVATE LINE SERVICE - TELEGRAPH

DEPARTMENT OF COMMERCE, CIVIL AERONAUTICS ADMINISTRATION-ONE WAY REPEATERS FOR EXTENSION SERVICE

1. GENERAL

*1.00 This issue supersedes Issue B. This appendix is reissued to revise the application of one way repeaters and make other minor changes.

*1.01 This appendix describes the application of the 13-Z-1 and 13-Z-2 One Way Telegraph Repeaters to extension stations on teletypewriter circuits of the Civil Aeronautics Administration. The 13-Z-2 type supersedes the 13-Z-1; information on the latter is included only for use in connection with existing installations.

*1.02 One way repeaters should be provided only when specified by a Private Line Service Order.

1.03 Complete details covering the theory, operation and physical makeup of the repeater are contained in the following instructions and drawings:

13-Z-1 Repeater

Long Lines Drawing 20295-SD-124
" " " 20295-T-124

13-Z-2 Repeater

Long Lines Drawing 20480-SD-124
" " " 20480-T-113

Common to Both Repeaters

B.S.P. Section P31.917 (Long Lines)
" " E45.922 (" ")

2. APPLICATION

2.01 These one way telegraph repeaters are designed to furnish receiving only teletypewriter service to one or more extension stations when operation of such station from a CAA station is specified.

2.02 As applied in connection with services of the CAA, the power to operate the loop and repeater shall not be obtained from the circuits or supply of the Civil Aeronautics Administration. It may be obtained from a separate power service supplied by the Telephone Company at the repeater location or from the supply to the subscriber receiving the extension service.

2.03 If power is obtained from a source at the repeater location (usually the CAA office) meeting the requirements of Paragraph 2.02, any extension service subscriber or combination of subscribers desired may be served from one repeater if within the transmission limits of the repeater as specified in Bell System Practices Section P31.917. If feasible, each subscriber served from a common repeater should be served by a separate loop facility rather than by connecting all subscribers in series on the same loop facility.

2.04 If power is obtained from the supply of the customer receiving the extension service, only those subscribers which are covered by a common contract may be connected to any one repeater.

Example: At one airport, extension service is furnished to 3 commercial airlines and a municipal department. Airlines A and B are covered by a contract with Aeronautical Radio and both may therefore be connected to one repeater. Airline C, however, is not a member

of Aeronautical Radio and must be served by a separate repeater. The municipal department extension is also a separate contract and must be served from a separate repeater. Thus 3 separate repeaters and three separate rectifiers are required to give extension service to these 4 customers.

2.05 If a suitable source of power could be obtained at the repeater location in the case cited above, all three airlines and the municipal department may be served from a single repeater, thereby saving two rectifiers and two repeaters.

3. INSTALLATION

3.01 The installation shall be in accordance with the standard practices and shall conform to all local rules and regulations.

3.02 The repeater shall be mounted in the telegraph terminal apparatus cabinet described in Appendix 2 of this section. The rectifier associated with the repeater may be located at the extension station, at the repeater location or at any other suitable location where the requirements for obtaining an A.C. power supply, described in Paragraph 2.02, are fulfilled.

3.03 If the power is obtained from the supply of the subscriber receiving extension service, use the utility outlet on the teletypewriter table associated with the receiving only teletypewriter. Connection plans for such an arrangement are given in B.S.P. Sections E45.922 and P31.917.

3.04 If it appears desirable to obtain power at the repeater location and the only power available there is from the circuits or supply of the CAA, arrange with the local power company to provide a metered lead for this purpose. (Any billing to the Telephone Company for this installation and power shall be handled through normal Plant channels.)

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PRIVATE LINE TELEGRAPH SERVICE

DEPARTMENT OF COMMERCE,

CIVIL AERONAUTICS ADMINISTRATION

RULES AND REGULATIONS GOVERNING THE TERMINATION OF CHANNELS AND THE INSTALLATION AND LOCATION OF EQUIPMENT IN CAA STATIONS USED FOR TELETYPEWRITER SERVICES AND THE EXTENSION SERVICES OPERATING THEREFROM

1. GENERAL

1.00 This Appendix is issued to include the latest information concerning the series of rules and regulations which have been established between the Long Lines Department and the Civil Aeronautics Administration pertaining to teletypewriter services furnished to the CAA as well as to the Receiving Only Extension Stations operating from this customer's circuits.

1.01 The CAA has adopted what they consider a "STANDARDIZED" Interstate Airways Communications Station (INSAC). Principally, this is a Station where all Serving Company Landline auxiliary apparatus used in connection with furnishing teletypewriter services, is installed in a location other than the Operating Room. This will apply to existing Stations where "MODERNIZATION" work discussed in Paragraph 1.02 below is not contemplated by the CAA Regional Office over the period of the next few years. It will also apply to any new Stations where the Regional Office does not plan to provide a "MODERN" installation initially and has no plans for "MODERNIZING" at a later date.

1.02 The CAA has also adopted what they consider as a "MODERNIZED" Interstate Airways Communications Station (INSAC). This type of station will consist of standard facility layouts, composed of the Air-Ground Operating Console and its associated 111-A Key or other Telephone equipment which is provided in connection with the "Service F" Interphone Network and discussed elsewhere in the "E" series practices. It will also consist of an equipment room, space for the Serving Company Landline terminating equipment and an Operating Room. This will apply, in general, to all Stations where major programs are contemplated to modify, relocate or install new facilities.

2. RULES AND REGULATIONS

2.01 All loose wiring at CAA Stations shall be dressed down and secured; unused wiring in terminal boxes shall be segregated and secured; unused wires in conduit shall be dressed down at each end and unused wiring not in conduits as well as any excess equipment shall be removed.

To avoid any momentary service interruptions due to accidental contacts, special 60D type fuse binding post insulators shall be placed on all conductor binding posts or other terminals, including bridged terminals, which are used to terminate CAA teletypewriter circuits.

These binding post insulators shall be provided in accordance with Bell System Practices Section C24.191 and A502.001.

All CAA teletypewriter circuits at Central Office Cross-Connection Frames shall be appropriately designated and the framemen appraised of the necessity for this designation to guard against service interruptions.

2.02 All wiring involving teletypewriter circuits shall be in accordance with the National Electric Code and any local rules and regulations that may apply. At installations where a single conduit is provided, power and signal circuit wiring must be separated by a metal barrier. If all wiring

contained in the conduit is lead sheathed, it is considered as fulfilling this metal barrier equipment.

2.03 Joint use shall be considered, whenever practicable, of the communications entrance cable and protection equipment cabinet by the Telephone Companies, i.e., Bell System or Connecting Companies, and the Western Union Telegraph Company, except where the latter company provides its own local facilities.

2.04 For the purpose of providing a dividing line between circuits and equipment of the Telephone Company and circuits and equipment of the CAA, the CAA will provide and install a terminal strip to be known as a "Demarcation Strip". This Demarcation Strip will be used for teletypewriter circuits as well as for control and leased line remote receiver services as covered elsewhere in the "E" Series Practices. The Demarcation Strip will consist of a terminal strip similar and equal to the Western Electric Company's 31-C Connecting Block with a 102C type Adapter mounted in a GA-16 cable Terminal Box and will be used for termination where this type of strip has sufficient connections. At locations requiring from 16 to 26 pair connections, a Terminal strip similar and equal to a Western Electric Company type 31-D Connecting Block with a 102D type Adapter mounted in a GA-26 cable Terminal Box will be provided by the CAA. At facilities requiring a larger number of circuit terminations, an appropriate strip or combination of strips similar and equal to Brach terminals in a sheet metal cabinet (distributed by the Graybar Electric Company in various sizes) will be provided by the CAA to accomodate all demarcation terminations in a single cabinet.

*At installations where a single demarcation strip is furnished, the Telephone Company shall terminate their circuits starting from the top of the strip, if it is mounted vertically, or from the left end of the strip, if it is mounted horizontally. Control circuit terminations will start at the center of the strip and work toward the Telephone Company connections.

*Indicates change

*Indicates change

*Remote receiver leased circuits will start on the lower center section of the strip and work toward Western Union Connections.

Note: Where the Western Union Telegraph Company provide services, they will terminate their circuits starting at the bottom of the strip and progressing upward, if the strip is mounted vertically, or from the right end of the strip progressing toward the left, if it is mounted horizontally.

In the case of Multiple combinations of Demarcation Strips, the Telephone Company and the Western Unicn Telegraph Company shall terminate their teletypewriter circuits on one strip as outlined above. Remote Receiver leased circuits and other control circuits shall be terminated on the second Demarcation Strip if only two strips are provided or on individual strips if three strips are used.

Where Mechanical Interlock equipment is installed and/or leased lines are utilized with other CAA owned and maintained equipment, the CAA will provide a separate Demarcation Strip in either the Air Route Traffic Control Center, the CAA equipment room or the Air Traffic Control Tower Equipment room, or both, as may be applicable. These Demarcation Strips will be similar to those described heretofore and will be mounted and wired as outlined for the other strips discussed herein.

All Telephone Company and other Serving Company connections shall be made to the solder side of the Demarcation Strip. The CAA will make their connections to the Screw Terminal side of the strip. Changes or rearrangements of circuit wiring or equipment may therefore be made by the Serving Companies or the CAA on their respective sides of the Demarcation Strip without affecting the wiring or equipment on the other side of the strip. Each Serving Company shall indicate on a posted

record provided by the CAA and associated with the Demarcation Strip Box, the circuit identification for each pair terminated thereon.

The CAA will mount the Demarcation Strip in the INSAC Equipment Room and in those cases where an equipment room is not provided, it will be mounted in the Operating Room. In either location the Strip will be located at a preferable minimum of two feet above the floor level in a readily accessible position.

For Overseas Airways Communications Station (OFACS) terminations the demarcation strip will be mounted in the equipment room at the Control Station in the same manner as prescribed for the Interstate Airways Communications Stations (INSAC). At the transmitting and receiving stations the strips will be mounted in the most suitable location as agreed upon locally.

2.05 The Demarcation Strip shall be suitably marked by the CAA as "CAA Demarcation Strip." Likewise equipment manufactured by the Western Electric Company that is owned, installed and maintained by the CAA and of a type commonly used by the Telephone Company shall be marked "CAA Equipment."

2.06 The cabling and wiring up to the CAA Demarcation Strip, such as from the Cable Entrance Terminal Box to other Distribution Boxes, Equipment Cabinets, etc., and thence to the Demarcation Strip shall be provided by the Telephone Company and shall be lead-covered or other approved shielded wiring. Wiring in conduit is considered to meet the requirement of "other approved shielded wiring." This will apply to all new or relocated installations and at existing installations where it is necessary to install additional cabling in connection with growth or other rearrangements affecting the service, as well as where interference to the CAA Radio apparatus is encountered. At some existing installations non-shielded cabling is installed that is adequately furnishing interference free service without hazard.

This cabling shall be replaced only if required in accordance with the conditions previously stated.

2.07 The provision of conduit installations in CAA quarters is the responsibility of the CAA. In existing buildings, the CAA will not provide conduit from the point of TELCO distribution termination to CAA quarters and, therefore, the provision of shielded cable in accordance with the conditions previously stated in Paragraph 2.06 above will apply. For new building construction, the CAA will coordinate with the necessary authorities for providing conduit installations from the point of TELCO distribution termination to CAA quarters.

2.08 With the exception of the Protection Equipment cabinet and the CAA Demarcation Strip discussed in Paragraph 2.04, no flush mounted apparatus cabinets or other terminal apparatus shall be installed on the walls of the CAA quarters, including the walls of equipment rooms set aside by the CAA for the partial or exclusive use of the Telephone Serving Companies, regardless of whether the building is Government owned or leased. The mounting of such equipment on the walls of basements which are usually of substantial construction is permissible. The use of any flush mounted (built-in) cable terminals or distribution boxes in existing buildings is also permissible. Such cabinets are not planned for CAA quarters in newly constructed buildings.

2.09 It is the intention of the CAA to provide the Telephone Company with adequate space to permit the orderly installation of the required terminating equipment for Telephone and Teletypewriter services.

The amount of space required by the Telephone Company in Equipment Rooms furnished by the CAA shall be confined to the present and anticipated CAA service requirements as arranged by local agreement between the CAA and the Telephone Company. Telephone Company One Way Repeaters and associated equipment for furnishing receiving only extension service from the circuits of the CAA networks to interests other

than the CAA, may be installed in available space in an existing apparatus cabinet and/or open type relay rack, provided the CAA Regional Office does not anticipate a requirement for the use of such space for expansion in the forseeable future.

At the existing larger Interstate Airways Communications Stations where an Air Traffic Control Center is also located, there is an equipment room set aside by the CAA for the Telephone Company. Terminating equipment furnished by that Company for the Control Center Telephone services and in some cases for Teletypewriter services, is installed in this equipment room. Such equipment shall remain in this room, at Centers existing as of March 16, 1949. However, the CAA desires that no additional equipment be installed in this room that will require additional floor space unless it is directly associated with the Control Center operations.

For Air Traffic Control Center facilities, established or relocated subsequent to March 16, 1949 all Telephone Company terminating equipment may be installed in a common "Landlines Equipment Room" provided by the CAA. At these locations there will be an additional Air Traffic Control Center equipment room which is to be reserved for CAA owned and maintained equipment directly associated with Control Center operations.

In some cases a room is provided for the joint use of the CAA and the Telephone Company for use as an equipment room to accommodate their radio apparatus and the Telephone Company terminating equipment. In other cases where an Airport Traffic Control Tower is operated by the CAA, an Equipment Room known as the "Tower Equipment Room" is provided and usually jointly used by the CAA and the Telephone Company for their respective equipments. This Equipment Room is provided in close proximity to the Tower and within the operating limits of the 102A Telephone Key Equipment as specified in other Bell System Practices. At times, it is feasible because of building layout considerations, to utilize a common Equipment Room for both the Interstate Airways Communication Station and the Traffic Control Tower CAA and Serving Companies Apparatus.

2.10 So far as practicable, no Telephone Company auxiliary apparatus, relay racks or cabinets are to be located in the CAA Operating Room, if other suitable quarters are available such as:

(a) Landlines equipment room set aside by the CAA for the exclusive use of the Serving Companies.

(b) INSAC, OFACS, Tower and Control Center equipment room jointly used by the CAA and the Serving Companies.

(c) Basement locations.

2.11 In cases where it is necessary to install auxiliary apparatus in the INSAC Operating Room as an interim arrangement, because of space limitations and the fact that equipment rooms or basement space is not available, it shall be installed in floor mounted cabinets in accordance with the instructions outlined in Appendix 2 of this Section.

2.12 For locations where an equipment room is provided for the exclusive use of the Serving Companies as defined in Paragraph 2.09 above, it will be satisfactory to mount the apparatus on standard open type relay racks. Basement locations for Telephone Company equipment is also permissible utilizing either relay rack or cabinet type mountings as is deemed advisable, provided of course such locations are not subject to conditions detrimental to the equipment or to installation and maintenance personnel as covered in standard installation practices.

2.13 In selecting equipment room locations either rooms used exclusively by the Serving Companies or jointly used with the CAA for INSAC and/or Tower equipment, consideration must be given to both Telephone and Telegraph services and especially the former with respect to the operating limits of the 102-A, 109A and 111-A Telephone Key equipment as outlined in the practices covering these services.

In no case shall the distance between the equipment location and the operating location exceed these limits.

Note: The permissible distance between the equipment room and the key units is limited by the voltage drop which can be tolerated in the various wires between the two locations. Based on the use of 22 guage wire, the distance from the circuit equipment to the key units should not be more than 186 feet for 102-A key equipment and 125 feet for 111-A key equipment. Where these limits result in undue hardship, it may be possible to extend these limits by making a special study of the particular installation. For example, by the use of 20 gauge wire, the distance can be increased to 295 feet for the 102-A key equipment and 195 feet for the 111-A key equipment.

2.14 At INSAC stations where a service telephone is provided in connection with the Service A, B or O Teletypewriter Networks, it shall be mounted on the right-hand side of the watch supervisor's desk. In connection with the provision of a service telephone at large INSAC stations, if an extension telephone is required at a secondary location for Plant maintenance reasons, its provision will not conflict with existing tariff regulations and arrangements may be accordingly made for its installation. If, however, the extension telephone is desired because of CAA requirements, it should only be provided upon receipt of a Private Line Service Order.

2.15 The CAA will provide the primary power supply for telegraph line terminal equipment such as the 128-B-2 subscribers set that is necessary to provide service as leased by the Government. This power supply shall be available from a suitable outlet conveniently located with respect to the equipment. The power supply required in connection with furnishing services contracted for by other than the CAA, however, must be derived from a source and in a manner that will involve no expense to the CAA.

2.16 The CAA has standardized a facility known as the "Combined Interstate Airways Communications Station - Air Traffic Control Tower Facility" which will require teletypewriter service on the Service "A" and "B" networks. This service will be on a receiving only (not extension service) or sending and receiving basis as ordered and will utilize customer owned and maintained teletypewriters installed in the Control Tower. As in the case of other CAA facility installations, a demarcation strip will be furnished by the CAA for the termination of theirs and the Serving Companies' wiring. These demarcation strips will be similar to those described heretofore in this appendix and will be mounted and wired as outlined for the other strips discussed herein.

2.17 In connection with installations in CAA Type "S" Watch Houses, the protection cabinet location and conduit runs as shown on the current issue of CAA Drawing D-21175 should be utilized. Reference to this drawing should be made by consulting the local CAA people.

2.18 In the event that the CAA or the Telephone Company shall with respect to its side of the Demarcation Strip plan the use of equipment which might be expected to cause a change in the functioning of the teletypewriter circuit or of the equipment connected to the other side of the strip, the planning party shall submit to the other party complete details regarding the planned equipment prior to placing it in service.

3. RECEIVING ONLY EXTENSION SERVICE TO INTERESTS OTHER THAN THE CAA

3.01 The Telephone Company will furnish receiving only extension service to applicants who have been approved by the CAA. Extension Service will be connected to any teletypewriter circuit furnished to the CAA under the Extension Service classification. Extension Service will be furnished by means of a one-way connecting arrangement and other equipment which will prevent extension circuit troubles from affecting the main CAA circuit. The connecting arrangement may be located either in the serving

testroom or at the CAA station. In the latter case the equipment location should be as mutually agreed between the CAA and the Telephone Company.

3.02 An application for Extension Service which is received by any office of the Telephone Company from an Aeronautical interest such as the Aeronautical Radio Incorporated (ARINC), shall be referred to the Washington Division Commercial Department Office of the Telephone Company and by it, to the CAA for authorization of the connection.

The application will indicate the name and address of the applicant and the circuit to which the connection is desired.

An application received by any office of the Telephone Company from other than aeronautical interest must be accompanied by evidence of written approval which the applicant will have obtained from the Chief of the Weather Bureau at Washington, D.C. The application will then be referred to the Washington Division Commercial Department Office of the Telephone Company for treatment as specified in the foregoing paragraph and will indicate similar data.

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Appendix 8
Issue B, 6-15-43
Long Lines Department
Dist. Class. 600 AC

PRIVATE LINE SERVICE - TELEGRAPH

DEPARTMENT OF COMMERCE - CIVIL AERONAUTICS ADMINISTRATION

DESCRIPTION OF PUSH KEY SWITCHING

UNITS EMPLOYED AT CAA STATIONS

1. GENERAL

1.01 The CAA provides a "Push Key Cabinet" instead of the usual loop jack switchboard at most of their stations, for switching teletypewriters between different loops. Although owned, operated and maintained by the customer, trouble in the board may affect our circuits; therefore, knowledge of the board's characteristics and operation is of value to the testroom.

The U.S. Army also provides these "Push Key Cabinets" at certain of their stations, and at some locations the Telephone Company is requested to connect loops to these cabinets.

1.02 This section contains a description and wiring diagram of the cabinet, together with instructions covering the procedure if trouble occurs in the board and affects our circuits.

1.03 This section is reissued to include the complete wiring diagram and to give a more detailed description.

2. DESCRIPTION

2.01 Each unit consists of a number of key strips mounted across the face of the board, one above the other. Two general types are provided; a twenty key cabinet with twenty keys per strip arranged for relay rack mounting, and a six

key cabinet with six strips of six keys each mounted in a metal cabinet. The six key cabinet is used at all atations except the large centers.

2.02 All keys are arranged with a "make before break" contact arrangement to maintain circuit continuity. All keys in a strip have a mechanical interlocking arrangement so that only one key at a time may be in an operated position. This is so arranged that if one key is pushed (to operate), any other key in the strip which may already be in the operated position is automatically released. The mechanical transfer action takes place prior to the actuation of the contact assembly of the key being operated.

2.03 Small knife switches are provided for each strip to short out the strip and permit removal of the strip for inspection and maintenance without interrupting the service. Other knife switches are provided to permit the following tests:

(a) Open any loop.
(b) Ground either or both sides of any loop.
(c) Short circuit any line.

2.04 Each teletypewriter unit (transmitter-distributor, 15 KSR, etc.) is connected to the "Equipment" terminal strip, which is wired to an individual key strip and connected to the key swingers. All the swingers on each strip are connected in parallel.

2.05 Each teletypewriter loop is connected to the "Lines" terminal strip for a single vertical row of keys. These are wired to the normally made contacts which are connected in series in much the same manner as the 63-C-1 Telegraph Loop Switchboard.

2.06 Figure 2 shows the wiring diagram of the "Six Push Key Cabinet." Although not shown in the drawing, any unused equipment strip should be strapped to insure continuity in the event a key in the unused equipment strip is accidentally operated.

3. OPERATION

3.01 This arrangement gives a completely flexible control of all equipment and all loops. Any set may be connected to any loop merely by operating a single push button.

3.02 Examples. Using Figure 2, the operation may be traced in detail.

Note: Figure 2 shows the wiring and push key arrangements as viewed from the rear of the cabinet, and examples (a) and (b) are worded accordingly to avoid confusion. Actually the push buttons are operated from the front of the cabinet so that the left-hand button viewed from the front in Figure 1 is the same as the right hand button in Figure 2.

(a) Assume Set #2 is being used on Loop #2 and it is desired to connect it to Loop #1 in series with Set #1 which is already connected to Loop #1. Push the first button on the right-hand end of Strip #2. This disconnects the set from the Loop #2 and connects it to Loop #1.

(b) Assume Set #1, connected to Loop #1 develops trouble and it is desired to remove it from the loop and substitute Set #2 which is spare. Push the first button on the right-hand end of Strip #2 to connect Set #2 to Loop #1. Remove Set #1 from Loop #1 by pushing one of the remaining keys in equipment Strip #1.

Loop	1	2	3	4	5	6
Set						
1	○	○	○	○	○	○
2	○	○	○	○	○	○
3	○	○	○	○	○	○
4	○	○	○	○	○	○
5	○	○	○	○	○	○
6	○	○	○	○	○	○

FIG. 1

4. TROUBLE PROCEDURE

4.01 It is possible, due to breakage, faulty manufacture or improper maintenance, for the unit to develop trouble, such as opens, shorts or crossed loops.

4.02 If trouble on the circuit is caused by this unit, notify the station operator and request him to make whatever changes are necessary to restore service. If satisfactory corrective action is not taken, follow the normal procedure for such cases and that outlined in Appendix 3 of this section.

4.03 As described in Paragraph 1.01, the Telephone Company normally has no responsibility in connection with these boards. In the event we are required to install the unit at a particular location, the following may be of assistance:

(a) A complete description of the board and its operation is included in the packing box with each board and is supposed to be retained at the station.

(b) If an individual key should stick in the down position, this condition can usually be remedied by rubbing wax on the black rubber cone that moves the two inner springs. The most convenient method is to take a small piece of heavily waxed paper and place it under the two heavy springs, twirling the shaft so that a portion of the wax is applied to the entire surface of the cone. Oil should not be used on any part of the key strip assembly.

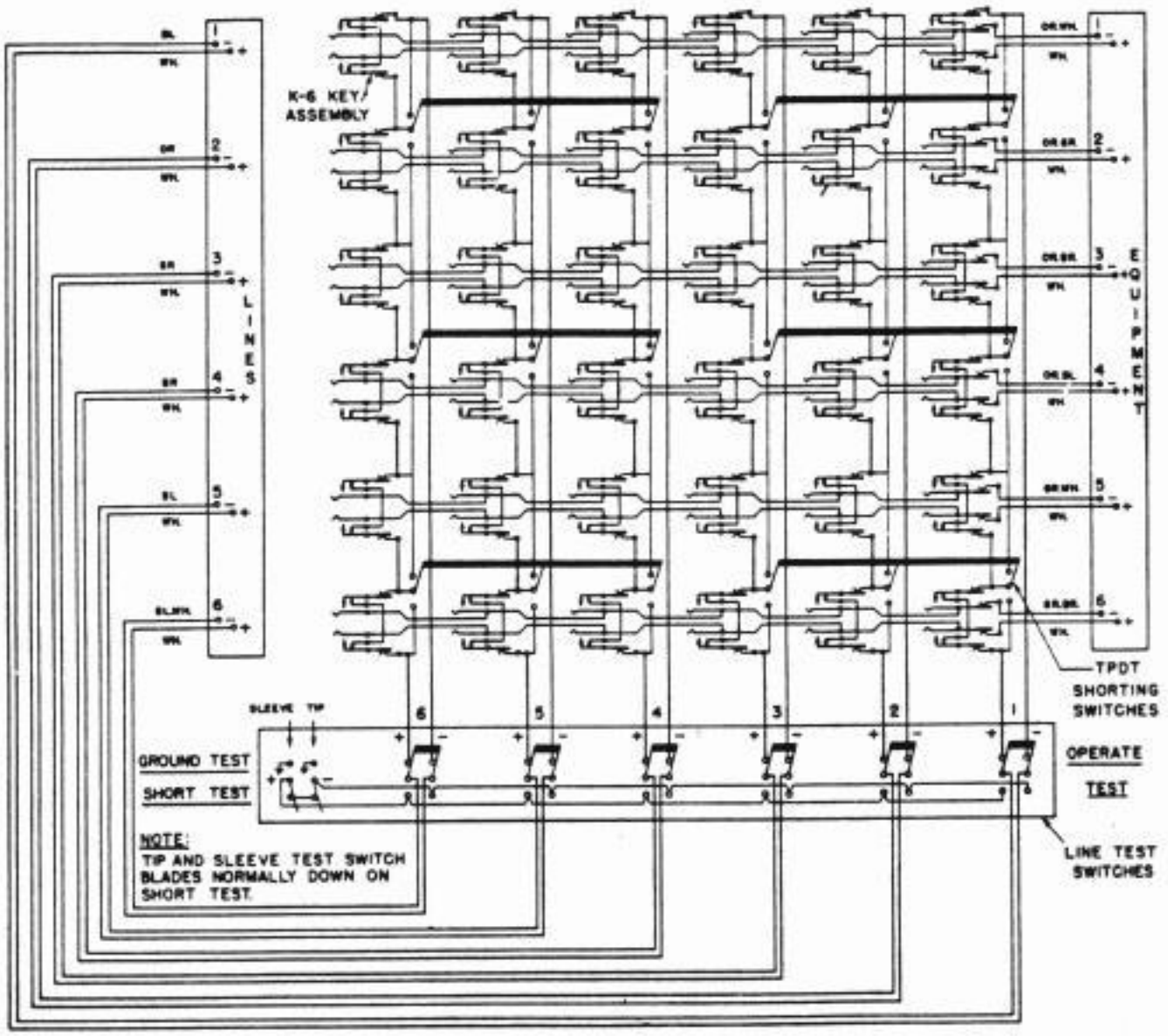

FIG. 2

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PUSH KEY
SWITCHING UNITS
AT CAA STATIONS

PRIVATE LINE SERVICE

CIVIL AERONAUTICS ADMINISTRATION

PROCEDURE - ARMY OWNED EQUIPMENT

ON CAA CIRCUITS

1. GENERAL

1.01 This appendix covers special procedures in connection with certain Army-owned and maintained teletypewriter equipment connected to CAA circuits. It is reissued to cover Army type teletypewriter equipment as well as the Bell System type of equipment.

1.02 The Army has a considerable number of drops (not extensions) on CAA circuits which are considered as "Receiving Only" drops. These drops, however, are normally equipped with sending and receiving teletypewriters so that on short notice they may become sending and receiving drops.

1.03 Station Teletypewriter Equipment. In order to avoid needless wear and to make sure that it will be in satisfactory condition if converted to two-way service, the sending mechanism on these machines is made inoperative. Normally this work is done by Army personnel, but Telephone Company personnel may be called on to disable this mechanism or to place it in commission again. The following procedure has been agreed upon and should be followed by Telephone Company personnel assigned to this work.

1.04 When the Army desires this work to be done by the Telephone Company, authorization will normally be covered by Private Line Service Order. Assistance may be requested locally, however, as outlined in instructions covering maintenance arrangements for customer owned equipment.

2. MODIFICATIONS

2.01 Bell System Type 15KSR Teletypewriter. This machine should be modified as follows:

(1) Remove the gear from the keyboard sending shaft. Reinsert its mounting screw, with washers attached, in the shaft. By means of a cord, tie the gear to the sending shaft between the bearing bracket and the driving clutch.

(2) Short circuit the keyboard contacts and break key by connecting a common strap between Terminals 3, 4 and 5 of the Send-Receive-Break key (K-1).

Note: On machines modified in accordance with Issue A of this Appendix, this strap was extended to include Terminals 1 and 2 of the Send-Receive-Break key. The change in method was instituted so that the modification of this key on the 15 teletypewriter would conform to that for the 19 type. 15-type teletypewriters which are now modified in accordance with Issue A need not be changed unless desired.

(3) Arrange the line-test key permanently in the "line" position so that the line relay cannot be disconnected from line. To do this, use a P-356557 plunger in the key. (If this plunger is not already in the machine, it is to be furnished by the Telephone Company and its cost included in the report of expense incurred.)

2.02 Army Type 15KSR Teletypewriter. This machine is ordinarily mounted on the XRT 97 or XRT 106 table. The wiring of this teletypewriter is essentially the same as that of the Bell System 15KSR teletypewriter. The principal difference in so far as this Appendix is concerned is that the key which is used as a line-test key on the Bell System type machine has been wired on the Army type machine to operate as a polar-neutral key (key pushed in - polar; key pulled out - neutral). This machine should be modified as follows:

(1) Same as 2.01 (1).

(2) Same as 2.01 (2).

(3) Install a strap between slip connection Terminals 51 and 56 of the teletypewriter base to prevent opening of the line relay biasing winding if the polar-neutral key is operated to the polar position.

2.03 Bell System Type 19ASR Teletypewriter. This machine should be modified as follows:

(1) Modify the perforator transmitter to provide for perforating only as described in Section P36.660 under "Modification of Perforator Transmitter for Limited Use of Keyboard Control Operating Lever."

Note: The 104749M blocking plate specified in Section P36.660 was not called for in Issue A of this Appendix and need not be provided on machines which are now modified in accordance with that issue. (Where this blocking plate is furnished by the Telephone Company, its cost should be included in the report of expense incurred.)

(2) Short circuit the keyboard contacts and break key by connecting a common strap between Terminals 3, 4 and 5 of the Send-Receive-Break key (K-1).

(3) Short circuit the transmitter-distributor sending contacts by connecting a strap between Terminals 2 and 3 of the transmitter-distributor mounting plate, upper springs.

(4) Open the power leads to the motor and start magnet of the transmitter-distributor by disconnecting from Terminals 6 and 8 of the transmitter-distributor mounting plate, the leads that are designated "D" and "B," respectively, on the 19A table circuit label drawing. Tape these leads separately.

Note: In the case of DC installations, the lead to be removed from Terminal 8 is designated "C" instead of "B."

(5) Arrange the line-test key permanently in the "line" position so that the line relay cannot be disconnected from the line. To do this, use a P-356557 plunger in the key. (If this plunger is not already in the machine, it is to be furnished by the Telephone Company and its cost included in the report of expense incurred.)

2.04 Army Type 19ASR Teletypewriter. This machine is ordinarily mounted on the XRT 96 or XRT 107 table. The wiring of these tables is materially different from that of the Bell System 19A table. However, the wiring of the teletypewriter units themselves is essentially the same as that of the teletypewriter units of the Bell System 19ASR machine, the principal difference, in so far as this Appendix is concerned, being that the key which is used as a line-test key on the Bell System type machine has been wired on the Army type machine to operate as a polar-neutral key (key pushed in - polar; key pulled out - neutral). This machine should be modified as described below.

Note: Other instructions specify the use of wiring plans covered in Sections P96.001 or P96.002 for Army type 19ASR teletypewriters on Bell System services. The modification instructions given herein assume machines wired in accordance with one of those Sections.

(1) Same as 2.03 (1).

(2) To render the keyboard contacts and the transmitter-distributor sending contacts ineffective, proceed as follows:

(a) Machines wired in accordance with Section P96.001. Remove the existing wires from bottom Terminals 3 and 4 of Line Terminal Block C in the teletypewriter table and tape them separately. Connect tip side of the loop to bottom Terminal 3 and ring side of the loop to the bottom Terminal 4 of Terminal Block C, instead of as shown in Section P96.001.

(b) Machines wired in accordance with Section P96.002. Remove the existing wires from bottom Terminals 3 and 4 of Line Terminal Block C in the teletypewriter table and tape them separately. Connect Terminal 7 of the 128B2 subset to bottom Terminal 3 of Line Terminal Block C and connect Terminal 6 of the 128B2 subset to bottom Terminal 4 of Line Terminal Block C, instead of as shown in Section P96.002.

(3) Disable the transmitter-distributor start magnet by removing the strap between Terminals 37 and 39 of Power Terminal Block B in the teletypewriter table. This strap should be stored for future use by fastening one end of it to unused Terminal 21 of Power Terminal Block B.

(4) Open the power leads to the transmitter-distributor motor by disconnecting at Terminal 41 of Power Terminal Block B in the teletypewriter table the lead from Terminal 6 of the transmitter-distributor mounting plate. Tape this lead.

2.05 With the modifications applied as described in this Appendix to either the Bell System Type 19ASR or the Army Type 19ASR machine, it will be noted that the perforator and the character counter mechanism will still function in the normal manner. This arrangement was requested by the customer.

2.06 Where Army Type 19ASR machines are modified as specified herein, a copy of the appropriate P96 section of Bell System Practices, marked to show the wiring changes which were made, should be left at the station for use by the customer's maintenance men.

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PRIVATE LINE SERVICE - TELEGRAPH

DEPARTMENT OF COMMERCE

CIVIL AERONAUTICS ADMINISTRATION

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** These sections have not been issued.

1. GENERAL

1.01 This section, which supersedes Issue B, covers the various operating procedures, special installation and maintenance practices and other special instructions pertaining to the teletypewriter service furnished to the Civil Aeronautics Administration and is being reissued to include more up to date information.

1.02 Some of the operating practices are primarily for testroom use and detailed instructions pertaining thereto are not necessary in this section. In such cases, the detailed instruction is contained in an appendix to E12.758 while the appendix to this section is merely an outline.