

## OFFICE INTERRUPTER FRAME EQUIPMENT DESIGN REQUIREMENTS TANDEM CROSSBAR SYSTEM

### 1. GENERAL

#### Scope

1.01 This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of the office interrupter frame. *This specification is applicable to the following systems and appears under the Plant Series numbers listed:*

*NO. 1 CROSSBAR SYSTEM..... 816-022-150  
TANDEM CROSSBAR SYSTEM 817-042-150*

1.02 This specification is reissued:

- (a) To list WECO ED drawings that replace BTL ED drawings.
- (b) To cover requirements for interrupters added on SD-25062-01, Issue 59-D.

#### Capacity

1.03 *The capacity of the interrupter frame is 30 interrupters but due to the limitations of the motor, shaft, couplings, and bearings, the number of interrupters mounted on one frame shall not exceed 24 except under the conditions outlined in 5.01.*

#### Description

1.04 The office interrupter frame is a single-sided steel structure 11 feet 6 inches high and 1 foot 10-1/2 inches wide. The frame is arranged to mount reciprocating bar-type interrupters which function to supply interrupted battery, ground, or tone to the various circuits in the crossbar office. The frame also mounts an ac-dc motor, motor fuse box, shaft, drive, and bearings, all of which serve as a means of actuating the interrupters on the frame. Each interrupter is equipped with thirty contact assemblies, fifteen top and fifteen bottom, consisting of a back, armature, and front spring. Because of the variable number of interrupter contacts required for different installations and the small amount of wiring between the various interrupters on a

frame no local cable is provided. Switchboard cable leads from the connecting circuits terminate directly on the interrupter contacts.

1.05 With each interrupter frame there is furnished a record book in which is entered the information heretofore stamped in abbreviated form on the designating tabs of the interrupters. Under this plan the interrupter contacts are stamped 1 to 15 on top, and 16 to 30 on the bottom. In the record book there is a page for each interrupter containing thirty lines, one for each group of contacts, on which are entered the contact functional designation and the name, location, and number of the connecting circuit. The back of these sheets together with five sheets bound in the front of the book is ruled to receive instructions for removing interrupters from service. This latter information is supplied by the telephone company. Another record book is provided for purposes of maintaining backward tracing information, if needed. One such book is furnished for each group of interrupter frames. It contains blank forms arranged for the listing of the connecting circuits in numerical sequence, together with the numbers of the equipment frames or units on which the circuits appear, the functional designations of the associated interrupter contacts, and their location on the interrupter frames. This information is filled in by the telephone company. The forward tracing record books are stored at their respective frames in holders provided for that purpose. The backward tracing record book is turned over to the telephone company.

#### Floor Plan Arrangement

1.06 A minimum of four interrupter frames is provided for each job. The frames shall preferably be placed at the cross aisle in two groups of two frames each, face to face in opposite lineups. In no case shall the frames be placed back to back in adjacent aisles. When additional frames are required on the larger installations, they shall be located in a manner best suited to the cabling and maintenance of the frames they serve.

**2. SUPPLEMENTARY INFORMATION**

- 816-000-000 — No. 1 Crossbar System Index  
 817-000-000 — Tandem Crossbar System Index  
 J20150 (816-015-150) — Switchboard Power Cabling  
 J25551 (816-040-150, 817-060-150) — End Guards, Aisle Pilot Lamp and DPTS Supports, Record Books and Holders, and Spare Fuse Mountings  
 J25552 (816-017-150, 817-037-150) — Frame Lighting and Appliance Outlets — Incandescent Type  
 J85505 — Frame Lighting and Appliance Outlets — Fluorescent Type

- KS-5316 — Drive Motor Fuse Box  
 KS-5407 — AC-DC Duplex Motor  
 Floor Plan Data — Section 9.2, Sheet 3

**3. DRAWINGS****Keysheets**

- SD-25000-01 — No. 1 Crossbar System  
 SD-25435-01 — Tandem Crossbar System

**Framework**

- ED-20150-01 — Framework Limits  
 ED-20182-01 — Oil Guards for Motor Couplings  
 ED-25023-01 — Frame Details  
 ED-25213-70 — Office Interrupter Frame — Assembly

**Equipment**

- ED-26503-10 — Assembly and Equipment for Office Interrupter Frames — No. 1 Crossbar and Tandem  
 ED-26503-11 — Typical Interrupter Equipment and Designations for Record Books, Frames 0 to 3 — No. 1 Crossbar Office Interrupter Frames  
 ED-26503-12 — Typical Interrupter Equipment and Designations for Office Interrupter Frames With Record Books — Crossbar System Tandem Office  
 ED-26503-13 — Typical Interrupter Equipment and Designations for Record Books, Frames 4 and 5 — No. 1 Crossbar System

**Wiring and Cabling**

- ED-25346-14 — Method of Running Power Feeders  
 ED-25346-15 — Method of Running Power Feeders  
 ED-26512-10 — General Switchboard Cabling

**4. EQUIPMENT**

- ED-25213-70 — Office Interrupter Frame — Assembly Group 2* — One interrupter frame assembly.

**5. GENERAL NOTES****Equipment**

**5.01** In general, not more than 24 interrupters shall be mounted on a frame due to limitations of the shaft and drive. However, where required, one additional interrupter may be added in the 25th position on the frame. Where 24 interrupters are mounted on the frame, this total may be made up of 24 165-type interrupters or 24 165-type and 166-type provided that the number of 166-type interrupters is less than half the total. Where all of the interrupters to be mounted are 166-type, the total number shall not exceed 17 per frame.

**5.02** One KS-5407 ac-dc duplex motor and associated No. 1034B drive shall be furnished for each office interrupter frame. The interrupter framework shall be shipped with interrupters, bearings, shaft, and drive equipped and mounted in place. The motor and motor fuse box shall be shipped separately and mounted on the job.

**5.03** Since the general construction and details of the office interrupter frame are similar to the panel system framework, and since the same framework limits apply, the panel system drawing listed under Part 3 herein may be used for these requirements.

**5.04** A minimum of 1 inch shall be allowed between interrupter frames or between an interrupter frame and another frame when the latter is adjacent to the bearing end of the interrupter frame. This is to permit access to the adjusting screws for the No. 10A bearing. This 1-inch space between the frame base angles shall be closed by means of the details shown on ED-25213-70, Fig. A.

**5.05** The connecting circuits shall be assigned to the interrupter contacts on the four frames in a uniform manner on all jobs insofar as possible. Likewise connecting circuits distributed over more than one frame for hazard reasons shall be assigned to the same interrupter position on each frame insofar as possible. Miscellaneous circuits are assigned in a manner best suited to the job conditions.

**5.06** In assigning the interrupter contacts, it is necessary that the requirements covered by the equipment notes on the interrupter frame circuit be followed for the purpose of minimizing service reactions in the event of a motor or drive failure, and in some cases of insuring synchronism of contact operation. In most cases the contacts for a group of circuits are distributed over two or four interrupter frames to minimize service reactions, or different contacts for the same circuit, such as those controlling the long and short timing intervals for markers, are placed on different frames. In other cases the contacts for associated circuits such as a marker connector and its senders are assigned to the same interrupter. To insure synchronism of operation, other contacts such as the RB and RF interrupters for district junctors are assigned to the same interrupter spring assembly — top and bottom. Another factor affecting the assigning of contacts is the switchboard cabling, which makes it desirable that the contacts serving a particular frame or bay be on the same interrupter frame or on the two frames constituting a pair.

**5.07** Gears of the proper type to meet the ultimate requirements of the office shall be furnished on the drive shaft for all unequipped interrupter positions.

#### **Wiring**

**5.08** No frame local cable shall be provided on the interrupter frame, since all entering leads terminate directly on the apparatus. A No. 6 bare ground wire shall be run from the ground bar at the top of the frame vertically down the frame and held in place by clips as shown on the frame assembly drawing ED-25213-70. Connection to this ground wire shall be made as required using No. 22 gauge type "C" wire.

#### **Cabling**

**5.09** Due to the miscellaneous nature of the switchboard cables incoming to the interrupter frames, cable fanning rings are provided instead of cable brackets on the frame uprights. The incoming switchboard cables shall be run through these rings and butted at the nearest ring above the first interrupter which the cable serves. The leads to the interrupter contacts shall be run through the ring at the end of the mounting bar and fanned to the interrupter contacts by means of the fanning strip which is mounted on the rear of each horizontal bar on the frame. The use of the fanning strip eliminates the necessity of providing a sewed arm. The leads to the interrupter contacts shall be dressed as covered in the wiring and cabling specification for crossbar equipment. The use of rings on the frame uprights facilitates the progressive running of the switchboard cables, and permits the leads from the outlying frames to be connected as they are installed. The rings also facilitate the installation of additions, since the necessity of resewing cable forms is avoided.

**5.10** Fanning rings as described above are provided in the rear of both frame uprights, thus permitting switchboard cables to be brought down either side of the frames. In general, the outside uprights of a pair of interrupter frames are used for cables terminating on one or the other frame, and the center uprights for cables whose leads terminate on both frames of the pair. The interrupter contacts are assigned with this in mind, insofar as possible, so that from a given frame or bay a single cable can be specified, which will terminate on a single interrupter frame or on two adjacent frames constituting a pair.

**5.11** One or more cables, as required, shall be run from each pair of interrupter frames to the nearest fuse bay to provide battery and tone leads for the interrupters on these frames.

**5.12** The dc supply for the interrupter frame motors shall be obtained from the 48-volt overhead 00 feeder supplying the frame line-up as shown on ED-25346-14 and ED-25346-15. Two No. 6 drop leads shall be furnished at each interrupter frame, connected to the battery feeder and ground bar at the top of the frame by means of standard connectors, and supported down the

inside of the right-hand frame upright by clips as shown on ED-25213-70. Connection to these drop leads at the bottom of the frame shall be made with No. 14 wire per KS-5482-01, by means of elbow connectors. The No. 14 wire shall be run through a knockout in the top of the motor fuse box and connected to the terminals provided therein.

**5.13** The ac supply for the frame motors shall be obtained from fuses in the power service cabinet in the power room. The leads shall be run in BX from the source along the cable rack to the interrupter frames. The odd- and even-numbered interrupter frames shall be fused on separate fuses in the power service cabinet and for this purpose two BX feeders shall be run.

The drop leads to the motor fuse box at the bottom of the interrupter frame shall also be run in BX and supported by clamps on the inside of the right-hand frame uprights as shown on the frame assembly drawing. The drop leads shall be connected to the feeders at the cable rack by means of standard T-connectors and be run through knockouts in the fuse box to terminals therein.

**5.14** No. 20 type "AM" wire shall be used for grounding the motor stop contacts of the drive. This wire shall be run from the drive contact, across the frame, and connected to the No. 6 ground lead. The lead shall be run through the fanning rings on the interrupter mounting bar.

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