

## TELEPHONE SETS—EXPLOSIVE ATMOSPHERES

### GENERAL REQUIREMENTS

#### 1. GENERAL

1.01 This section gives general information and safety requirements for telephone sets used in locations having Class I (explosive gases or vapors) or Class II (combustible dusts) atmospheric conditions. These telephone sets (Fig. 1, 2, 3, 4, and 5) are listed by the UNDERWRITER'S LABORATORIES, INC. for use in explosive atmospheres. Information on each of these sets will be found in separate sections on the KS-14476, List 1 or List 2, KS-14548, 320-type (MD), 520B, and 2520B telephone sets.



*The classifying of hazardous locations is not the responsibility of the Telephone Company. Information concerning the classification should be provided by the customer in accordance with the latest issue of the National Electrical Code. If any doubt or disagreement exists, the local inspection authority should be consulted.*

1.02 This section is reissued to add the G11-type handset.

1.03 Class I locations include the following:

- (1) **Division 1**, locations in which hazardous concentrations of flammable gases or vapors are likely to exist continuously, intermittently or periodically in the course of normal operations.
- (2) **Division 2**, locations in which flammable gases, vapors or volatile liquids are used, but which, in the judgement of the code-enforcing authority, would only become hazardous in case of an accident or some unusual operating condition.

**Note:** An example of a Class I, Division 1 location would be the interior of paint spray booths used for extensive painting operations;

the external space for a distance of 20 feet horizontally from the open face of such booths shall be considered to be Class I, Division 2 unless judged otherwise by the code-enforcing authority.



Fig. 1—KS-14476 Type Telephone Set

1.04 Class II locations include the following:

- (1) **Division 1**, locations in which combustible dust is or may be in suspension in the air continuously, intermittently, or periodically under normal conditions.
- (2) **Division 2**, locations in which combustible dust will not normally be in suspension in the air, or will not be likely to be thrown into

#### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement

suspension by normal operation of equipment or apparatus.⚡

1.05 Telephone sets designed for explosive atmospheres shall be installed only upon proper authorization. It is necessary for the customer and the telephone company to have a definite agreement regarding the locations of the telephone set, auxiliary apparatus, and protector.

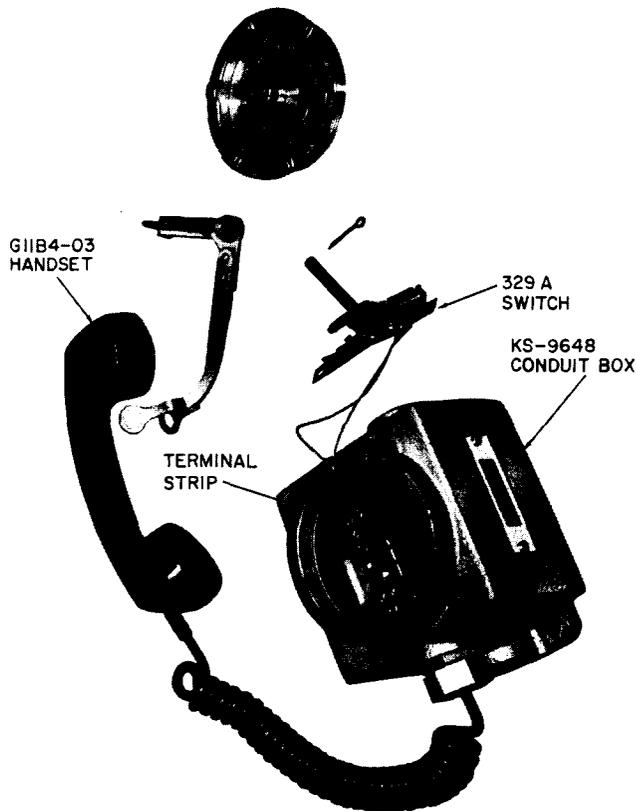


Fig. 2—KS-14548 Telephone Set⚡

2. REQUIREMENTS

2.01 Telephone sets for explosive atmospheres, including associated external bells and control relay sets, are designed to provide security against ignition of the surrounding atmosphere. All parts of the apparatus which might produce an

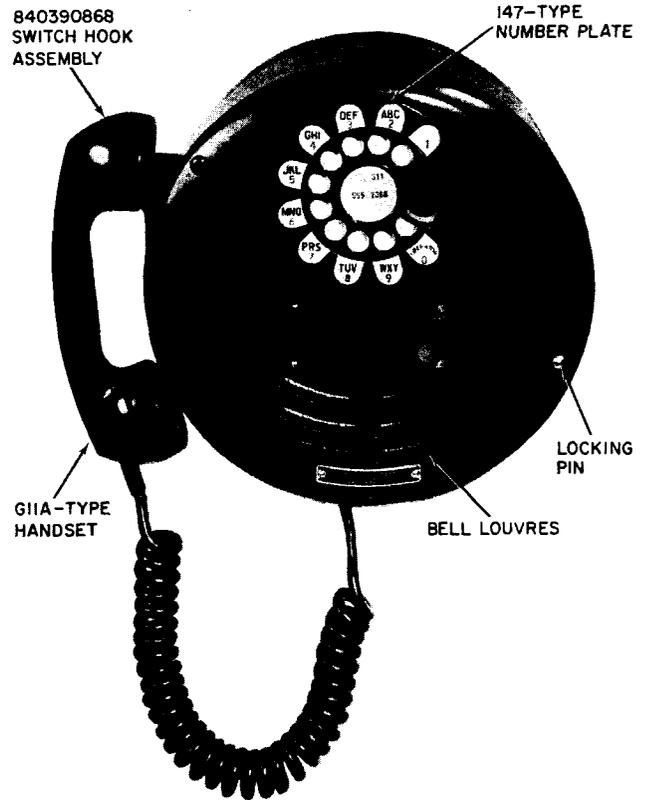


Fig. 3—320-Type Telephone Set⚡

electrical spark are completely enclosed. All passages to the outside are made so that any spark or flame which might be created in the set will be extinguished before reaching the outside atmosphere. This is extremely important.

2.02 Table A lists and subdivides into groups the conditions which constitute explosive atmospheres.

2.03 Table B lists the types of apparatus which may be used under conditions listed in Table A.

2.04 ⚡Telephone sets 500C, 500D, 554A, and 554B, installed in conventional manner, may be used in Class I, Division 2 location of the National Electrical Code book (latest issue) upon approval of local authority having jurisdiction.⚡

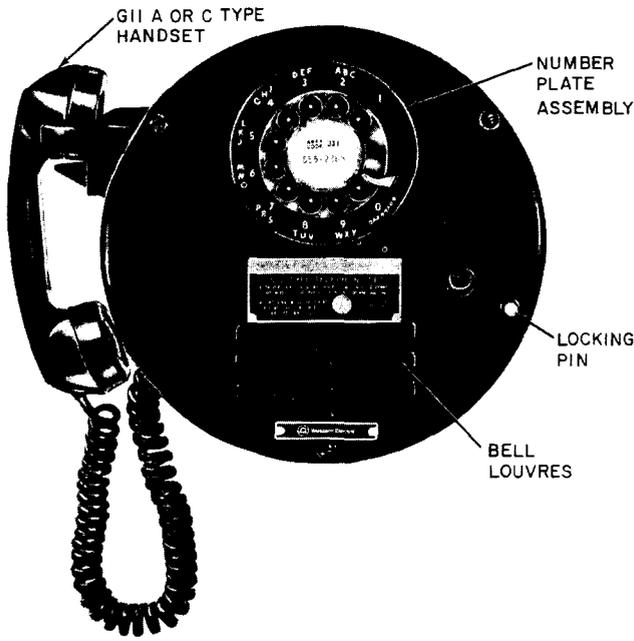


Fig. 4—520B Telephone Set

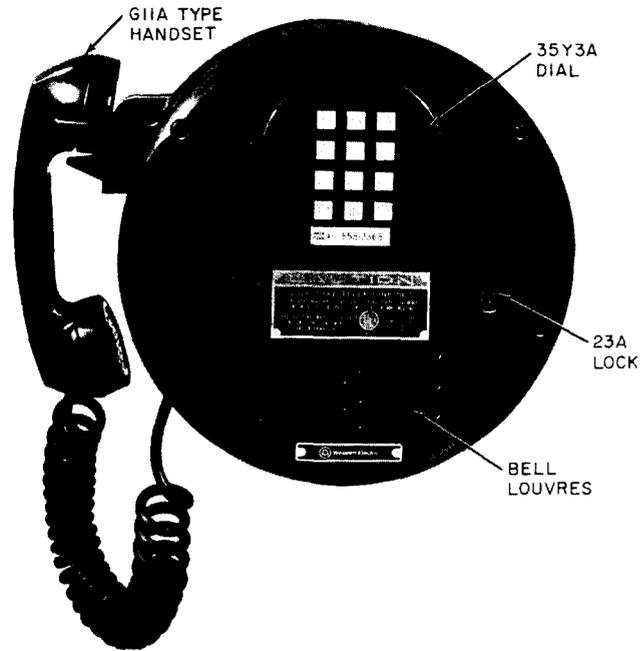


Fig. 5—2520B Telephone Set

### 3. PRECAUTIONS

**3.01** The presence of explosion-proof wiring devices on electrical wiring and apparatus shall be considered as evidence that the location is likely to be hazardous.

**WARNING:** *Under no circumstances should telephone apparatus or wiring be installed in an area designated Class I, Group A. This classification covers areas containing acetylene and the apparatus listed under Table B is not suitable for this use.*

**3.02** Bell System telephone apparatus or wiring, other than that designed for use in explosive, atmospheres, may be found in locations which, based upon proper inquiry, are thought likely to be explosive. Such cases should be brought to the attention of the local supervisor.

**3.03** Use the following precautions:

- (a) Avoid striking tools on metal objects and against concrete, stone, or any substance that might produce a spark.

- (b) Do not use test equipment capable of producing an electrical spark in an explosive atmosphere.

- (c) Under *no* circumstances shall explosion-proof apparatus be unlocked or covers removed without first disconnecting line wires at the protector and disconnecting commercial power from any auxiliary signals or relays.

**3.04** It is extremely important that any broken or worn parts be replaced. Also, correct any abnormal conditions, however minor, without delay in order to maintain maximum protection. Periodic inspection of the apparatus should be specified locally at intervals consistent with local specifications.

**3.05** All apparatus should be completely assembled before connecting the line wires at the protector and the power to the signals.

### 4. INSTALLATION

**4.01** Wiring shall consist of "*E*" block wire or equivalent in *grounded rigid conduit*. A sealed fitting shall be located within 18 inches of the apparatus (Fig. 6). All fittings must be

approved explosive-proof types, in accordance with the National Electrical Code and any local regulations applicable to hazardous locations.

**4.02** Fig. 6 shows a typical installation with apparatus, conduit, and fittings. Sealing fittings should be installed in a manner that meets the following electrical code requirements.

- (a) Conduit is connected to station ground.
- (b) Use the sealing compound approved for the specific fitting.
- (c) In each conduit run leaving the "Class I, Hazardous Area" the sealing fitting may be located on either side of the area boundary, provided no gases or vapors can enter the conduit beyond the seal. There shall be no union, coupling, box, or fitting between the seal and boundary.
- (d) Conduit seals shall be placed as close as practicable to, and in no case more than 18 inches from, an apparatus enclosure within the hazardous area. Where two or more such enclosures requiring seals are connected by nipples or conduit not more than 36 inches long, a single seal in each nipple or conduit is sufficient provided it is not more than 18 inches from either enclosure.
- (e) When conduits are of 2-inch or larger size, seals shall be provided within 18 inches of enclosures or fittings which house terminals, splices or taps.

(f) No junction box or similar enclosure shall be placed between a seal and an apparatus enclosure.

(g) Splices and taps shall not be made within sealing fittings.

(h) Sealing compound shall not be used in any fitting containing splices and taps.

**4.03** The protector must be located outside the hazardous area. In addition to the regular protector, a 1094A protector should be provided. UNDERWRITERS' LABORATORIES, INC. listing of equipment requires that 60D fuses be in series with the line wire at the conduit entrance outside the hazardous area. For outdoor locations, the 1094A protector may be used with the 97A protector mounting.

93C  
BSP 460-100-400

**5. MAINTENANCE**

**Warning: Before removing apparatus unit for any reason, be sure line wires are disconnected at protector. Defects due to any cause, even though seemingly slight, shall be corrected, without delay.**

**5.01** Sets requiring repairs more extensive than those covered in related sections should be removed from service and returned to the Western Electric Company. Sets in good condition may be moved to different locations on the same premises.

◆ TABLE A ◆

## EXPLOSIVE ATMOSPHERE CLASSIFICATIONS AND CONDITIONS

CLASS	GROUP	ATMOSPHERE CONDITIONS (DIVISION 1)* †
I	B	Contains hydrogen, manufactured gas or gases, or vapors of equivalent hazard.
	C	Contains ethyl ether vapors, ethylene, or cyclopropane.
	D	Contains gasoline, hexane, naphtha, benzene, propane, alcohol, acetone, benzol, lacquer solvent vapors, butane, or natural gas.
II	E	Contains metal dust, including aluminum, magnesium, and their commercial alloys and other metals with similar hazardous characteristics.
	F	Contains carbon black, coal, or coke dust.
	G	Contains flour, starch, or grain dust.

\* Hazardous concentrations are or may be present continuously, intermittently, or periodically in the course of normal operations.

† For a complete listing of the atmosphere contained in each group refer to the latest issue of the National Electrical Code.

◆ TABLE B ◆

**APPARATUS LISTED BY UNDERWRITER'S LABORATORIES INCORPORATED  
FOR USE IN HAZARDOUS LOCATIONS**

BSP REFERENCE	APPARATUS	CLASS I			CLASS II		
		B	C	D	E	F	G
502-415-201	Telephone Sets, KS-14476, Lists 1 and 2		•	•	•	•	•
502-415-202	Telephone Set, KS-14548	•	•	•			
502-415-200	Telephone Sets, 320A, C, E, F, ER, and FR (MD)	•	•	•	•	•	•
502-415-203	Telephone Sets, 520B and 2520B	•	•	•	•	•	•
502-415-202	Foot Switch, KS-14547	•	•	•			
502-415-202	Dialing Unit, KS-16014		•	•	•	•	•
	Pushbutton Condulet, KS-16020		•	•	•	•	•
463-110-100	Signal Bells, KS-8547, Lists 1, 2, 3, and 4	•	•	•		•	•
463-120-100	Power Relay Sets, KS-16763, Lists 4, 5, and 6		•	•		•	•
	Line cut-off switch Crouse-Hinds ETS22 or UL approved equivalent		•	•	•	•	•
	Power cut-off switch Crouse-Hinds ETS24 or UL approved equivalent		•	•	•	•	•

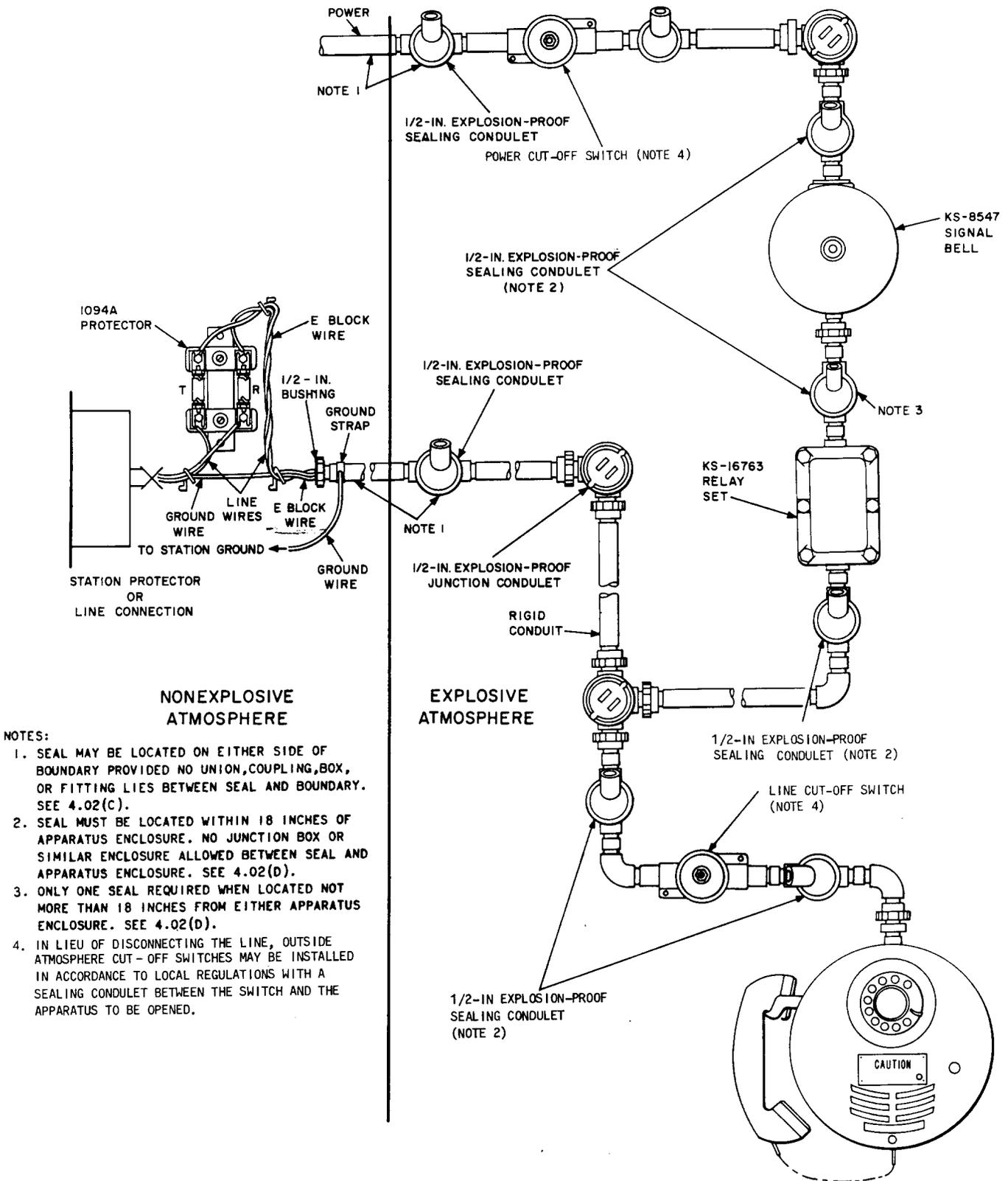


Fig. 6—Typical Conduit Arrangement