

## 48-TYPE DATA UNITS IDENTIFICATION

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1. GENERAL . . . . .	1	<b>A. 48A1 Data Unit</b>
2. DESCRIPTION . . . . .	1	<b>2.01</b> The 48A1 data unit (Fig. 1) contains the circuitry required to provide alternate voice service. The data unit consists of component apparatus mounted on a plug-in printed wiring board. The data unit is housed in a 45A1, 46B1, or 59A1 data mounting.
<b>A. 48A1 Data Unit</b> . . . . .	1	<b>2.02</b> The 48A1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 9-11/16 inches deep. The data unit weighs 1-1/4 pounds.
<b>B. 48B1 Data Unit</b> . . . . .	1	<b>2.03</b> The 48A1 data unit provides the following functions:
<b>C. 48C1 Data Unit</b> . . . . .	3	<ul style="list-style-type: none"> <li>● Alternate voice service for modems over a 4-wire or 2-wire private line through the interface of a DAS 829-type CIU.</li> <li>● A 4-wire to 2-wire conversion to interface with a 2-wire key telephone set.</li> <li>● 2600-Hz manual ringdown signaling.</li> <li>● Control of station equipment through use of a key telephone set.</li> <li>● Audible ringback signal.</li> <li>● 2600-Hz ring detector controlling audible and lamp indications provided by the key telephone set.</li> <li>● Locked-in ring detection.</li> <li>● Control of a not-in-data signal to modem.</li> </ul>
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 <b>1. GENERAL</b>		
<b>1.01</b> This section provides the identification of the 48-type (48A1, 48B1, 48C1, 48D1, 48ER1, 48FR1, and 48G1) data units. These data units are used in conjunction with data auxiliary set (DAS) 829-type channel interface unit (CIU) to terminate 4-wire or 2-wire private line voiceband data channels in various station arrangements.		
<b>1.02</b> This section is reissued to add information on the 48ER1, 48FR1, and 48G1 data units. Since this reissue is a general revision, arrows normally used to indicate changes have been omitted.		
<b>1.03</b> The 48A1, 48B1, 48C1, 48ER1, 48FR1, and 48G1 data units are plug-in circuit packs that are housed in single or multiple data mountings. All connections to these data units are made through the data mountings. The 48D1 data unit is rack mounted and does not require housing.		
		<b>B. 48B1 Data Unit</b>
		<b>2.04</b> The 48B1 data unit (Fig. 2) contains the circuitry required to provide 4-wire dial

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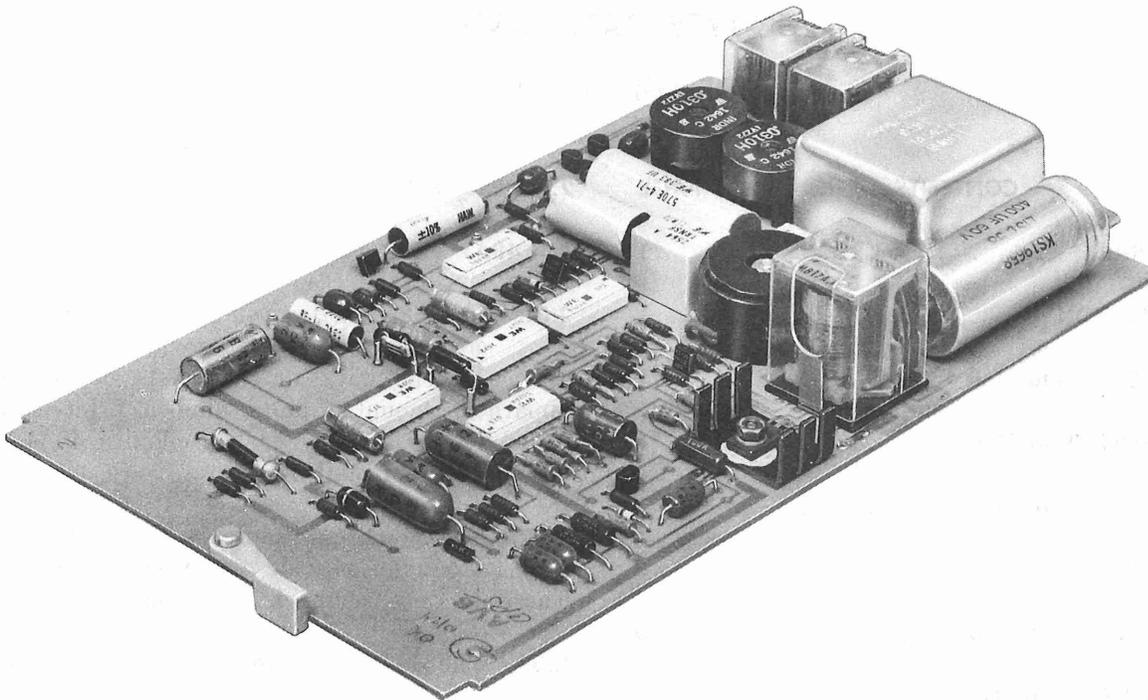


Fig. 1—48A1 Data Unit

backup service with manual dialing. The data unit consists of component apparatus mounted on a plug-in printed wiring board. The data unit is housed in a 45A1, 46C-type, or 59A1 data mounting.

**2.05** A test jack is located at the front of the data unit. This jack will accept a standard 310 plug. A variable attenuator, a variable gain control, and an installer option (slope equalizer) are located on the printed wiring board.

**2.06** The 48B1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 9-11/16 inches deep. The data unit weighs 2 pounds.

**2.07** The 48B1 data unit provides the following functions:

- 4-wire dial backup service for Bell System modems interfacing with a DAS 829-type CIU.
- Termination for a 4-wire dial backup channel consisting of two 2-wire switched network (dial-up) lines.
- Transfer of modem interface to either a 4-wire private line or a 4-wire dial backup channel through use of a key telephone set.
- Variable gain on backup receive pair to control level of received signal.
- Optional 4-dB slope equalizer on backup receive pair.
- Variable attenuation on backup transmit pair to control level of transmitted signal.
- Control of a not-in-data signal to modem.
- Control of a dial backup signal to modem.
- Key telephone set lamp indication of dial backup mode.
- Ring detection and key telephone set lamp indication on each dial-up line.
- Line surge protection.

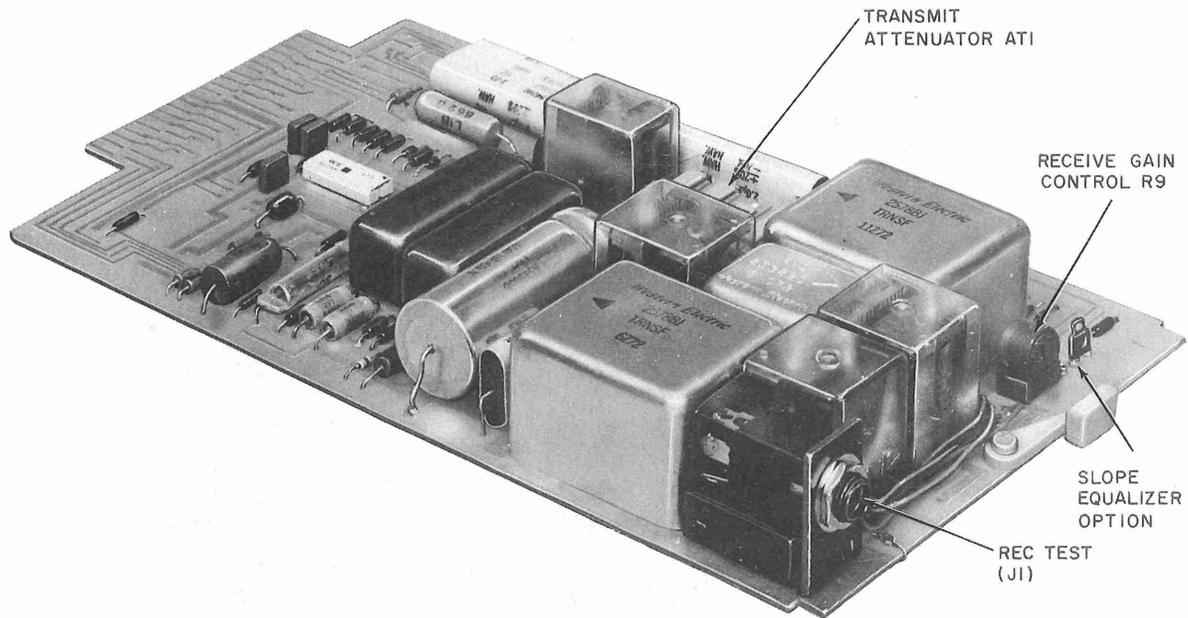


Fig. 2—48B1 Data Unit

- Impedance matching (600-ohm modem to 900-ohm dial-up line).

### C. 48C1 Data Unit

**2.08** The 48C1 data unit (Fig. 3) contains the circuitry required to provide a 2-by-4 switching matrix that can connect any one of four 4-wire modems to either one of two 4-wire dial backup channels. The data unit consists of component apparatus mounted on a plug-in printed wiring board. An attached cable and connector J1 permit direct connection to a 48D1 data unit. The 48C1 data unit is housed in a 46C-type data mounting.

**2.09** The 48C1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 9-11/16 inches deep. The data unit weighs 1-3/4 pounds.

**2.10** The 48C1 data unit provides the following functions:

- 4-wire switched dial backup service for modems interfacing with a DAS 829-type CIU when used with a 48B1 data unit housed in a 46C1 or 46C2 data mounting or with a 48ER1 data unit housed in a 46C2 data mounting, and with a 48D1 data unit connected to an 18- or 30-button CALL DIRECTOR® key telephone set.

- A 2-by-4 switching matrix to connect any one of four modems to either one of two 4-wire dial backup channels.
- Direct connection to a 48D1 data unit.
- Control of a not-in-data signal to modem.
- Control of a dial backup signal to modem.

### D. 48D1 Data Unit

**2.11** The 48D1 data unit (Fig. 4) provides an interface adapter for use with a 46B1 and/or a 46C-type data mounting to concentrate control of 48A1, 48B1 or 48ER1, and 48C1 data units in an 18- or 30-button CALL DIRECTOR key telephone set. The 48D1 data unit can be mounted on 19- or 23-inch relay racks.

**2.12** The 48D1 data unit provides six 50-pin connectors, P4 through P9, for direct connection of up to six 48C1 data units mounted in a 46C-type data mounting. A 24-Vac transformer, a bridge rectifier power supply, a regulated power supply, and four fuses are integral parts of the 48D1 data unit. A 4-foot power cord (840339907) is supplied with the 48D1 data unit.

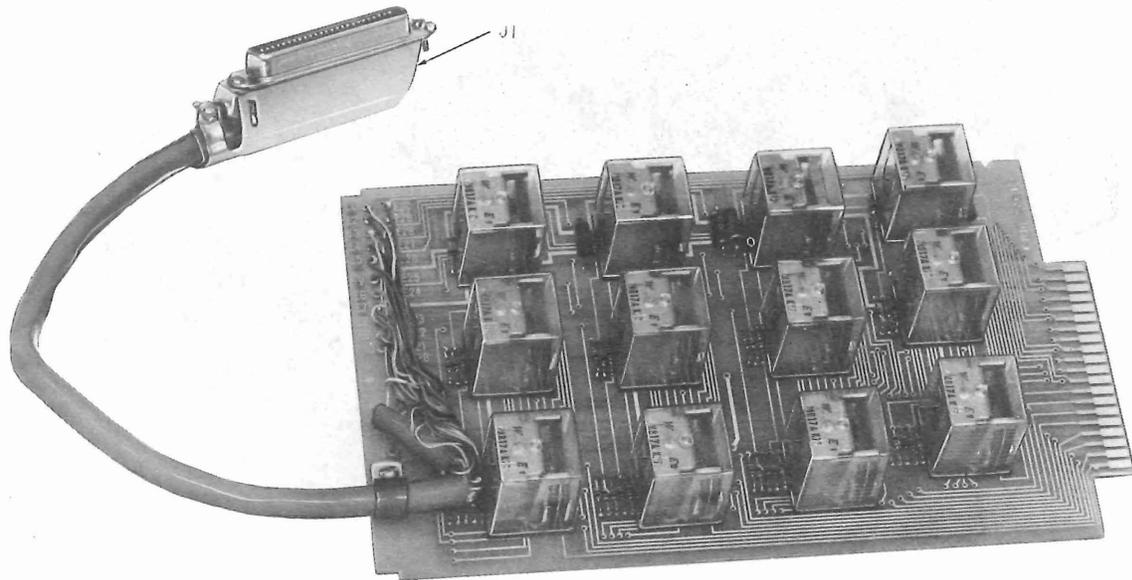


Fig. 3—48C1 Data Unit

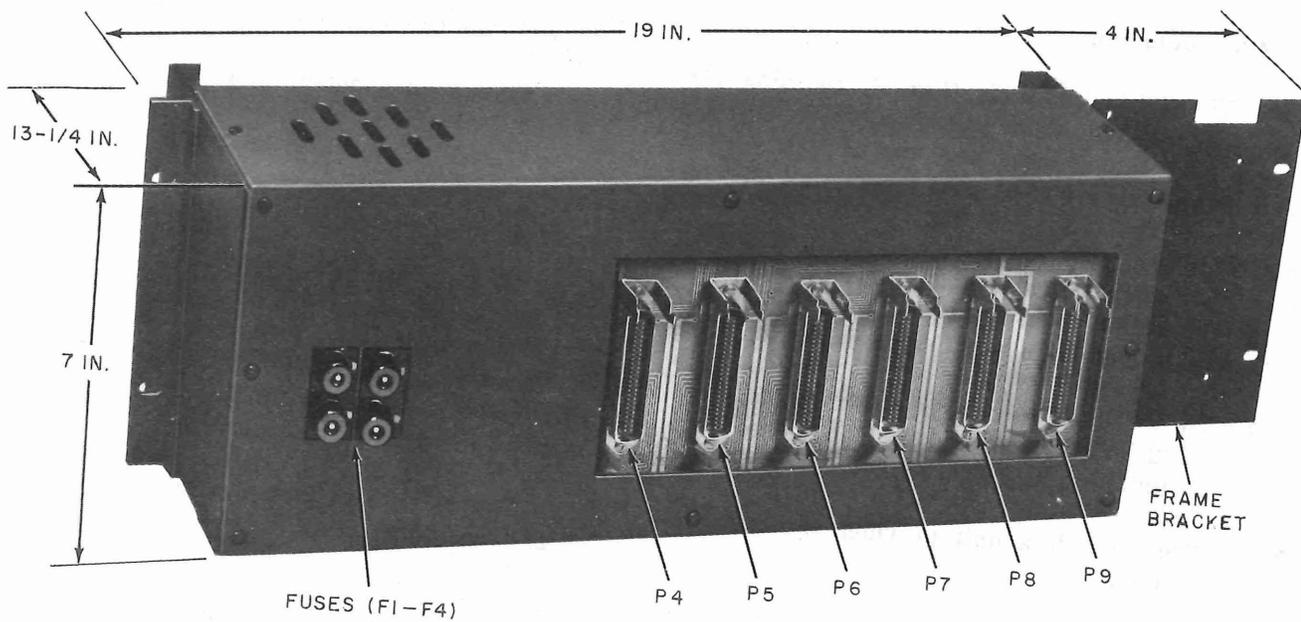


Fig. 4—48D1 Data Unit

**2.13** The backplane of the 48D1 data unit contains twelve 50-pin connectors. Connectors J1 through J5 permit connection to an 18- or 30-button CALL DIRECTOR key telephone set. Connector J6 permits connection to a 46C-type data mounting. Connectors P1 through P3 permit connection to up to three 46B1 data mountings containing a maximum of twenty-three 48A1 data units. Connectors P11 and P12 permit concentrated connection to a maximum of twenty-three modems to provide dial backup status to modems requiring this information. Connector P10 is provided for future use. Power cord connector P13 is located on the rear of the data unit adjacent to the backplane.

**2.14** The 48D1 data unit is 7 inches high, 19 inches wide, and 13-1/4 inches deep. The data unit weighs 24 pounds.

**2.15** The 48D1 data unit provides the following functions:

- Direct connection to up to three 46B1 data mountings containing a maximum of twenty-three 48A1 data units.
- Direct connection to up to six 48C1 data units housed in a 46C-type data mounting.
- Direct connection to a 46C-type data mounting when 4-wire dial backup service is required.
- Concentrated connection to a maximum of twenty-three modems to provide dial backup status signals to the modems if required.
- Direct connection to an 18- or 30-button CALL DIRECTOR key telephone set.

#### **E. 48ER1 Data Unit**

**2.16** The 48ER1 data unit (Fig. 5) contains the circuitry required to provide 4-wire dial backup service with manual or automatic dialing. The data unit consists of component apparatus mounted on a plug-in printed wiring board. The data unit is housed in a 46C2 or 59A1 data mounting. A handle is provided on the data unit faceplate to facilitate removal of the data unit from the data mounting. The data unit complies with all requirements of the FCC Registration Program. The registration number for the 48ER1 data unit is AS593M-67751-PC-E. The ringer equivalence number for each line is 0.5A.

**2.17** Two test jacks are located on the data unit faceplate. These jacks will accept a standard 310 plug. A locking switch and a dial backup indicator light are also located on the faceplate. Two gain control switches and three installer options (call control, unit control, and power supply) are located on the printed wiring board.

**2.18** The 48ER1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 10-1/16 inches deep. The data unit weighs 1-7/8 pounds.

**2.19** The 48ER1 data unit provides the following functions:

- 4-wire dial backup service for modems interfacing with a DAS 829-type CIU.
- Protective circuit to enable connection of nonregistered modems to a 4-wire dial backup channel consisting of two 2-wire switched network (dial-up) lines.
- Variable gain on backup receive pair to control level of received signal.
- Signal power limiter on backup transmit pair to enable connection of nonregistered modems to a 4-wire dial backup channel.
- Variable gain on backup transmit pair to control level of transmitted signal.
- Control of a not-in-data signal to modem.
- Control of a dial backup signal to modem.
- Lamp indication of dial backup mode.
- Hazardous voltage protection.
- Impedance matching (600-ohm modem to 600-ohm dial-up line).
- Transmitter to send start and stop signals to a 48FR1 data unit. Transmitter and associated logic control an unattended dial backup terminating station.
- Manual dialing option providing the following:
  - (a) Transfer of modem interface to either a 4-wire private line or a 4-wire dial

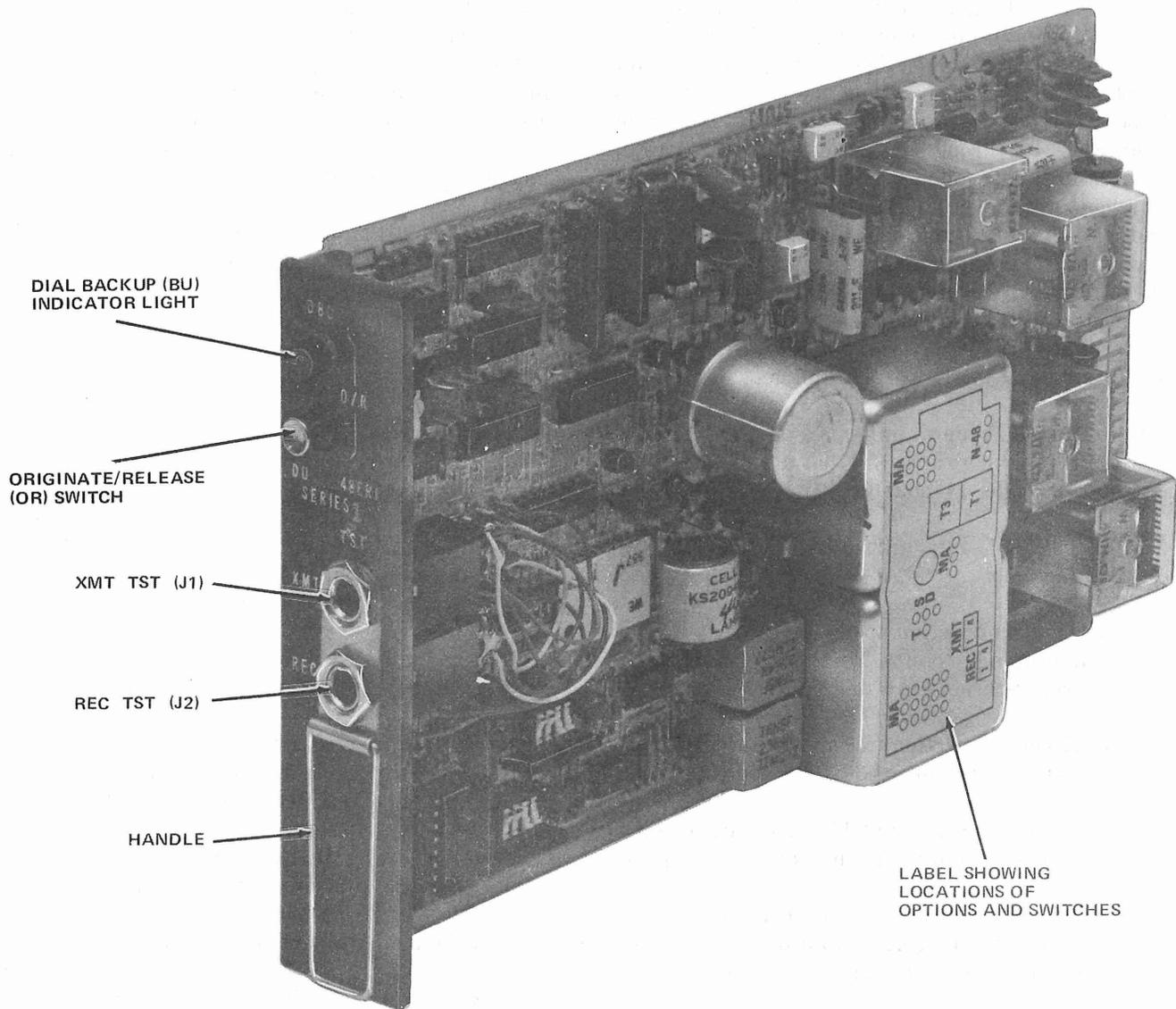


Fig. 5—48ER1 Data Unit

backup channel through use of a key telephone set.

- (b) Ring detection and key telephone set lamp indication on each dial-up line.
- (c) Attendant origination of calls through use of a key telephone set.
- Automatic dialing option providing the following:
  - (a) Origination of a 4-wire dial backup channel under control of a locking key

provided as part of 48ER1 data unit or under control of a customer- or modem-provided contact closure.

- (b) Control of a 43A or 53A station dial or partial control of a DAS 801CR-L1/2 automatic calling unit (ACU).
- (c) Ring detection under control of internal logic.
- (d) Transfer of modem interface to a 4-wire dial backup channel through use of internal logic.

(e) Release from dial backup mode under control of a locking key provided as part of 48ER1 data unit or under control of a customer- or modem-provided contact closure.

- Test jacks on modem side of 4-wire dial backup channel.

#### F. 48FR1 Data Unit

**2.20** The 48FR1 data unit (Fig. 6) contains the circuitry required to provide 4-wire dial backup service with automatic answering. The data unit consists of component apparatus mounted on a plug-in printed wiring board. The data unit is housed in a 59A1 data mounting. A handle is provided on the data unit faceplate to facilitate removal of the data unit from the data mounting. The data unit complies with all requirements of the FCC Registration Program. The registration number for the 48FR1 data unit is AS593M-67757-PC-E. The ringer equivalence number for each line is 0.5A.

**2.21** Two test jacks are located on the data unit faceplate. These jacks will accept a standard 310 plug. A nonlocking switch and a dial backup indicator light are also located on the faceplate. Two gain control switches and three installer options (call control, unit control, and power supply) are located on the printed wiring board.

**2.22** The 48FR1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 10-1/16 inches deep. The data unit weighs 2 pounds.

**2.23** The 48FR1 data unit provides the following functions:

- Telco-provided unattended 4-wire dial backup service for modems interfacing with a DAS 829-type CIU.
- Protective circuit to enable connection of nonregistered modems to a 4-wire dial backup channel consisting of two 2-wire switched network (dial-up) lines.
- Variable gain on backup receive pair to control level of received signal.

- Signal power limiter on backup transmit pair to enable connection of nonregistered modems to a 4-wire dial backup channel.
- Variable gain on backup transmit pair to control level of transmitted signal.
- Control of a not-in-data signal to modem.
- Control of a dial backup signal to modem.
- Lamp indication of dial backup mode.
- Hazardous voltage protection.
- Impedance matching (600-ohm modem to 600-ohm dial-up line).
- Receiver to detect start and stop signals transmitted by a 48ER1 data unit. Receiver and associated logic enable control of an unattended dial backup terminating station.
- Loop-current monitor providing for release from dial backup mode when an interruption of loop current exceeding 5 ms is detected.
- Two-minute timer and associated logic providing for release from dial backup mode when terminating station is improperly accessed.
- Release key providing for manual release from dial backup mode when dial backup channel is lost due to a system malfunction; eg, loss of carrier facilities constitutes a system malfunction.
- Transfer of modem interface to a 4-wire private line when a stop signal is received on dial-up line 2.
- Dial-up lines placed on-hook when a stop signal is received on dial-up line 2.
- Automatic answering, 48FR1 data unit enabled option always permits unattended operation of a dial backup terminating station.
- Automatic answering, customer enabled option permits customer control of a dial backup terminating station. A customer- or modem-provided contact closure enables normal unattended operation of the station.

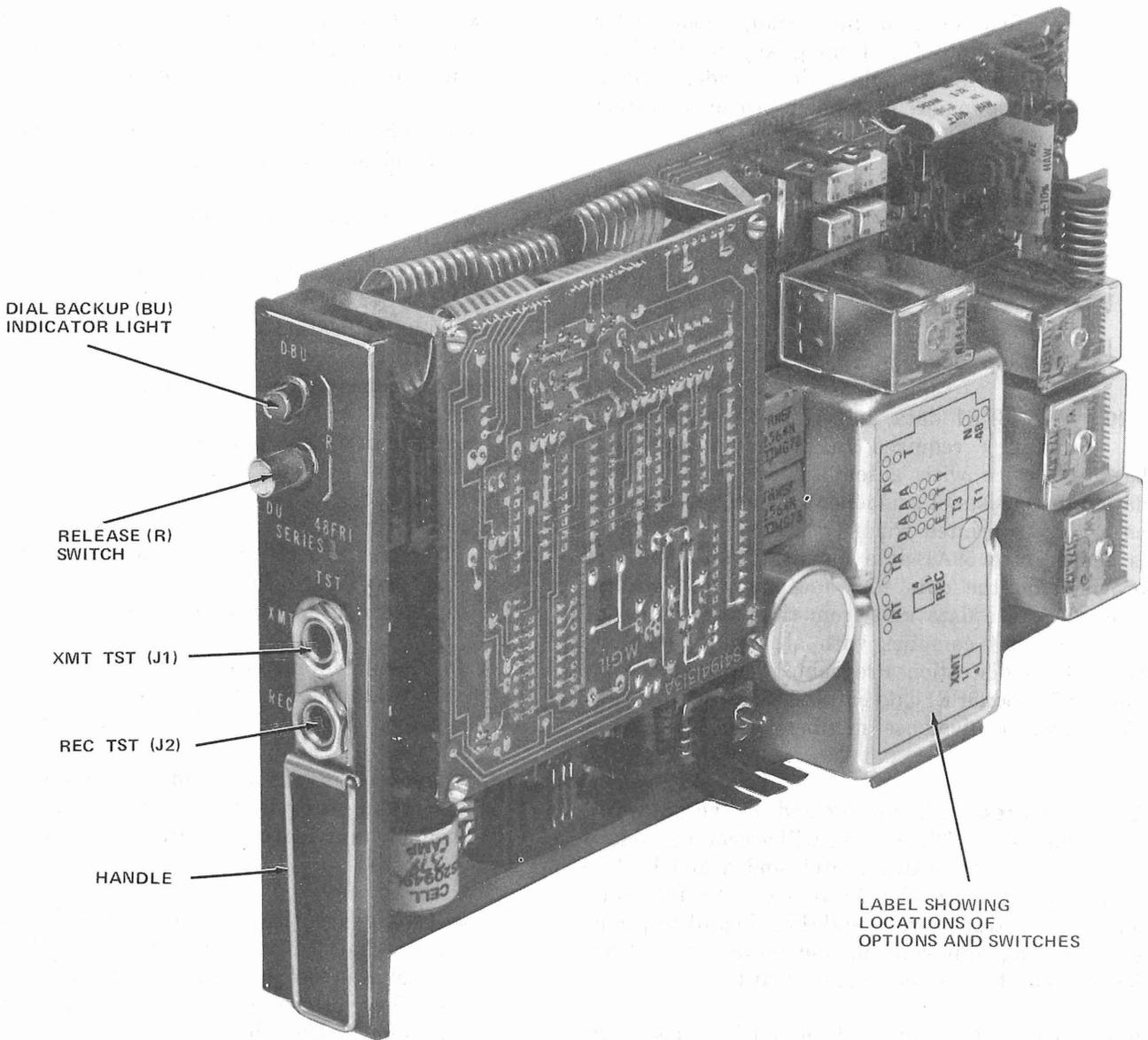


Fig. 6—48FR1 Data Unit

When the contact is open, a dial backup channel cannot be established.

- Unattended operation (two calls answered within a timed interval option) providing the following:
  - (a) Ring detection under control of internal logic.
  - (b) Logic associated with dial-up line 1 assures that line 1 answers any incoming

call, by tripping ringing with a line-holding coil.

- (c) Logic associated with dial-up line 2 assures that line 2 answers any incoming call, by tripping ringing with a line-holding coil, when dial-up line 1 is on hold.
- (d) Transfer of modem interface to a 4-wire dial backup channel at end of a start signal received on dial-up line 2. Receipt of start signal completes calling sequence.

- Unattended operation (automatic call back option) providing the following:
  - (a) Ring detection under control of internal logic.
  - (b) Logic associated with dial-up line 1 assures that line 1 answers any incoming call, by tripping ringing with a line-holding coil.
  - (c) Logic associated with dial-up line 2 assures that line 2 goes off-hook, starting a 43A or 53A station dial, when dial-up line 1 is off-hook for at least 5 seconds. Line 2 is placed on hold when station dial completes dialing.
  - (d) Transfer of modem interface to a 4-wire dial backup channel at end of a start signal received on dial-up line 2. Receipt of start signal completes calling sequence.
- Test jacks on modem side of 4-wire dial backup channel.

#### G. 48G1 Data Unit

**2.24** The 48G1 data unit (Fig. 7) contains the circuitry required to provide conversion from a 2-wire to a 4-wire channel. The data unit consists of component apparatus mounted on a plug-in printed wiring board. The data unit is housed in a 46B1, 59A1, or 62A1 data mounting. A handle is provided on the data unit faceplate to facilitate removal of the data unit from the data mounting.

**2.25** A monitoring jack and a test jack are located on the data unit faceplate. These jacks will accept a standard 310 plug. An installer option (power supply) is located on the printed wiring board.

**2.26** The 48G1 data unit is 1-1/4 inches high, 5-1/2 inches wide, and 10-1/16 inches deep. The data unit weighs 2/3 pound.

**2.27** The 48G1 data unit provides the following functions:

- Balanced hybrid circuit consisting of a modem transmit and receive port, a station transmit port, and a station receive port.
- Gain in the station transmit port to offset hybrid and insertion losses in the transmit path.
- Gain in the station receive port to offset hybrid and insertion losses in the receive path.
- Test and monitor jacks in the modem port.
- Power supply option permitting operation from a 24 Vac, -24 Vdc, or -48 Vdc supply.

### 3. REFERENCES

**3.01** Additional information concerning the 48-type data units is contained in the following publications:

SECTION	TITLE
598-082-100	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Description
598-082-200	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Installation and Connections
598-082-500	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Test Procedures

**3.02** Detailed information concerning the 48-type data units is contained in CD- and SD-10247-01.

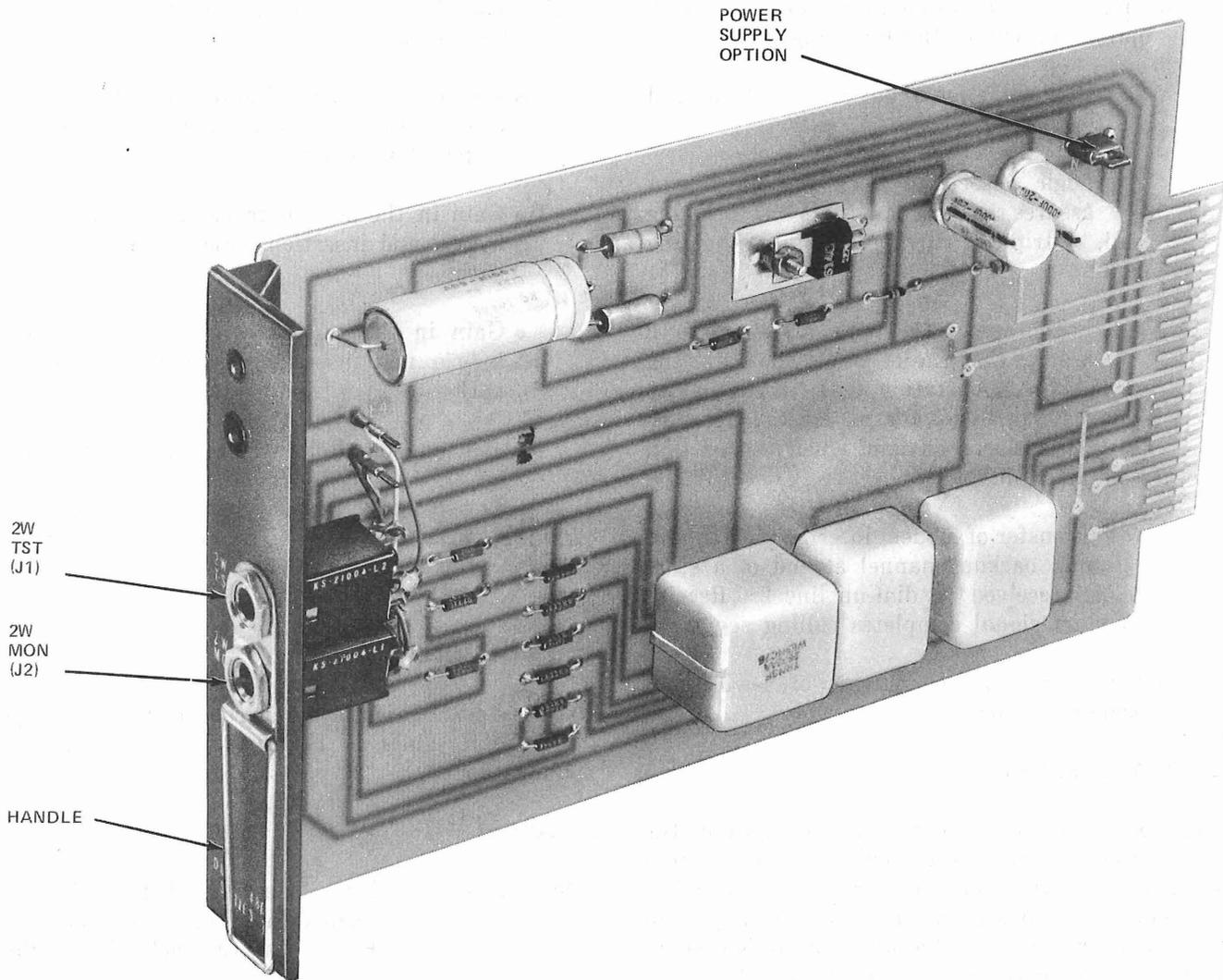


Fig. 7—48G1 Data Unit