

**DATA SET 202D-TYPE
TRANSMITTER-RECEIVER
THEORY OF OPERATION AND
SUPPLEMENTARY INFORMATION**

1. GENERAL

- 1.001** This addendum supplements 592-016-150, Issue 1.
- 1.002** This addendum is reissued to correct information in Table A pertaining to option ZJ.
- 1.003** Change information in 1.05 to read as follows:

Some data set 202D1- and 202D2-type units are powered by a self-contained J87235A1-L1 power supply. Other data sets 202D1 and 202D2 (series 6), data sets 202D3 and 202D4 which are now supplied with a 17A, series 1 power unit are being replaced with a 17A, series 2 or 48A power unit due to the high harmonic content of the 17A series 1 power unit which causes data distortion. The 48A power unit is less susceptible to input power frequency variations than either the 17A series 1 or the 17A series 2 power units. Replacement of the 17A with the 48A power unit raises the series number of the data set, but replacement with the 17A, series 2 does *not* raise the series number of the data set. All of the power supplies provide a semiregulated +18.0V dc and -18.0V dc source from a commercial ac source. The power supplies employ a ferroresonant circuit which requires a 117-volt (± 10 percent) 60 (± 0.6) Hz input for the 17A-type power unit and 60 (± 3) Hz input for the 48A power unit. Data set 202D-type consumes approximately 7 watts of ac power.

- 1.004** In 2.03 add reference to data sets 202D5 and 202D6.
- 1.005** Replace Table A on page 5 with Table A of this addendum to correct information pertaining to option ZJ.¶

- 1.006** Change 3.03 to read as follows:

The data set transmitter circuits respond to Request-to-Send (RS/CA) and Send Data (SD/BA) signals from the business machine. In return, the data set provides a Clear-to-Send (CS/CB) signal to the business machine. The CS/CB signal is returned 200 (± 20) milliseconds [200 (± 20), 60 (± 10), or 30 (± 5) milliseconds with data sets 202D5 and 202D6] after RS/CA is received. The 200-millisecond delay is used when the remote data set is equipped with the squelch option (switched network or 2-wire private line). The 60- and 30-millisecond options are used in polling applications when the remote data set is strapped for the 40-millisecond or 20-millisecond carrier detector options, respectively, without the receiver squelch. These shorter clear-to-send and carrier detector intervals are for use on fast-turnaround 2-wire or 4-wire private line applications.

- 1.007** Expand 3.07 to include the following:

Data sets prior to 202D1 and D2, series 10 and 202D3 and D4, series 5 contain discrete level options as shown in Table B. These options lower the transmission level in order for the signal to reach the central office at the proper level. Data sets starting with those series numbers mentioned and data sets 202D5 and 202D6 contain potentiometers to vary the output transmission level from 0 to -12 dBm.

- 1.008** In 3.08 add reference that the soft turnoff feature is optional in data sets 202D5 and 202D6 as well as 202D3 and 202D4.

- 1.009** In 4.10 add reference that in data sets 202D5 and 202D6 the delay is either 40 milliseconds (*option YM*) or 20 milliseconds (*option YN*).

1.010 Information in 5.06 is changed as follows:

Data sets prior to 202D1 and D2, series 10 and 202D3 and D4, series 5 contain discrete level options for the reverse channel as shown in Table C. Data sets starting with the series numbers mentioned and data sets 202D5 and D6 contain potentiometers to vary the transmission level from 0 to -12 dBm.

1.011 Change information in 6.11 to read as follows:

Data set carrier will start immediately, but will not reach the telephone line until the 2025-Hz tone has ceased. The transmitting station returns a CS/CB signal after a delay of approximately 200 (± 20) milliseconds. Within the transmitting data set, if it is a **called** station, the CS/CB signal is inhibited during answer-back tone transmission, and switches ON approximately 150 milliseconds after the tone ceases. On 4-wire facilities where echo suppressors are not used in the customer lines and the data mode has been established for both **called** and **calling** stations, transmission time may be saved by transmitting after applying RS/CA and ignoring the CS/CB signal or, if the data set is a 202D5 or D6, by using the 60 (± 10) or 30 (± 5) millisecond timing intervals. This condition may not exist in turning around a switched network call. The turn-around feature cannot be satisfactorily used on 2-wire facilities because the wide variances in system propagation times are not coincident with the receiver squelch time and the 200 (± 20) millisecond RS/CA -to-CS/CB delay must be used.

1.012 In 6.14 add reference that on 4-wire facilities where fast turn-around is required, a 20 (± 5) millisecond or 40 (± 10) millisecond delay may be used in data set 202D5 or D6.

1.013 In 7.07 under (d) **Clear-to-Send (CS/CB)—Driver**: Add reference that in data sets 202D5 and 202D6, CS/CB is switched ON either 200 (± 20) milliseconds (*option YP*), 60 (± 10) milliseconds (*option YR*), or 30 (± 5) milliseconds (*option YS*) after RS/CA comes ON.

1.014 In 7.07 under (g) **Data Carrier Detector (COO/CF)—Driver**: Add reference that in data sets 202D5 and 202D6 certain line noises and speech patterns, as well as carrier, can operate this circuit if the level is received for at least 40 (± 10) milliseconds (*option YM*) or 20 (± 5) milliseconds (*option YN*).

1.015 In 7.07 under (i) **Reverse Channel-Transmit (RCT/SA)—Terminator**: Add reference that the discrete level options of -3, -6, or -9 dBm are provided in data sets prior to 202D1 and D2, series 10, and 202D3 and D4, series 5. Data sets starting with the series numbers mentioned and data sets 202D5 and D6 contain potentiometers to vary the transmission level from 0 to -12 dBm.

1.016 In 7.09, 8.43, 8.51, and 8.67 delete reference pertaining to Section 592-016-400 entitled Data Set 202D-Type, Transmitter-Receiver—Connections and replace it with reference to Section 592-016-200 entitled Data Set 202D-Type, Transmitter-Receiver—Installation and Connections.

TABLE A
OPTIONS AND CONNECTIONS

NUMBER REQUIRED PER CIRCUIT	DESCRIPTION OF FEATURE OR OPTION		OPTION DESIG	TERMINAL BOARD	CONNECTION	REMARKS
1	2-wire operation 4-wire operation		Z Y	TB2	(61, 62) (64, 65) (62, 63, 64)	— Note 1
1	600-ohm termination 900-ohm termination		X W		(32, 33) (37, 38) (33, 34) (38, 39)	Note 1 —
1	Clamp on demod output when noise protection is required Clamp on demod output when noise protection is not required		V U		(20, 21) (21, 22)	Note 1 —
1	Reverse channel in Reverse channel out		T S	TB3	(1, 2) (6, 7) (2, 3) (7, 8)	Notes 1, 4 —
1	Squelch in Squelch out		R ZL	TB2	(35, 36) (25, 35) or (22, 23)	Remove ZL wiring Notes 1, 2, 3
1	Automatic answering No automatic answering		Q —		(59, 60) —	Note 1 Remove Q wiring
1	EIA voltage interface Contact interface		N M		(1, 2) (4, 5) (6, 7) (8, 9) (2, 3) (5, 6) (9, 10) (12, 13)	Note 1 —
1	Data Transmit Power Levels	0 dBm -3 dBm -6 dBm -9 dBm	K J H G		(11, 12) (24, 25) (22, 23) (23, 24)	Note 5 Notes 1, 5 Note 5 Note 5
1	Equalizers for Switched Network Operation	Amplitude Equalizer In Amplitude Equalizer Out	F E		(18, 19) (17, 18)	Note 1 —
1		Delay Equalizer In Delay Equalizer Out	B A		(27, 28) (30, 31) (28, 29, 30)	Note 1 —
1	Bit Rate	900 bits per second or less Over 900 bits per second	ZA ZB		(14, 15) (15, 16)	— Notes 1, 11
1	Enables data set TEST key Disables data set TEST key		ZE ZF		(44, 45) (47, 48) (50, 51) (45, 46) (48, 49) (51, 52)	Note 1 Note 9
1	2-wire operation without 4-wire backup 2-wire operation with 4-wire backup 4-wire operation without 2-wire backup 4-wire operation with 2-wire backup		ZG — ZH —		(53, 54) — (54, 55) —	— Note 7 Note 1 Note 6
1	When data set is used with 6017AP key only		—	TB1 TB2	(19, 25) (57, 58) (40, 41)	—
	When data set is not used with DAS 804A or 6017AP key		ZJ	TB1 TB2	(19, 23) (57, 58) (40, 41)	Note 1
	When data set is used with DAS 804A with or without 6017AP key		—	TB1 TB2	(19, 25) (56, 57) (42, 43)	—
1	Reverse channel Transmit Power level	-3 dBm -6 dBm -9 dBm	ZK ZM ZN		(W) From 1A1 to TB4-1 (W) From 1A1 to TB4-2 (W) From 1A1 to TB4-3	Note 5 Notes 4, 5 Note 5
1	40-millisecond carrier detector timing 20-millisecond carrier detector timing		YM YN	TB2	(24, 25) (25, 26)	Notes 1, 10 Note 10
1	200-millisecond clear-to-send timing 60-millisecond clear-to-send timing 30-millisecond clear-to-send timing		YP YR YS	TB4	(2, 3) (1, 2) (3, 4)	Notes 1, 10 Note 10 Note 10
1	Carrier soft Turnoff	IN OUT	ZY ZZ	CP AS39 CP AS39	(1, 2) (3, 4)	Notes 1, 8 Note 8

Notes

1. Factory-furnished
2. On data sets 202D1, D2, D3, and D4, in order to provide option ZL, a P-43N572 connector lead assembly or equivalent is required to connect terminal 25 to 35.
3. On data sets 202D5 and D6, connection of terminal 22 to 23 provides option ZL.
4. Wiring factory-furnished when reverse channel is specified.
5. Data sets prior to 202D1 and D2, series 10, and 202D3 and D4, series 5 contain discrete level options. Data sets starting with these series numbers and data sets 202D5 and D6 contain potentiometers to vary the transmit level from 0 to -12 dBm.
6. When DAS 804A is used to switch from 4-wire to 2-wire (1 DDD backup line) remove ZH wiring. When DAS 804A is used to switch from 4-wire to 2 DDD backup lines, install ZH wiring.
7. When DAS 804A is used to switch from 2-wire to 4-wire or from 4-wire to 2-wire operation, remove both ZG and ZH wiring.
8. Option is located on transmitter circuit pack AS39, AS77, AS87 and is available in data sets 202D3, D4, D5, and D6.
9. Requires TEST Key in DAS 804A.
10. Options contained only in 202D5 and D6.
11. Use option ZB for *all* bit rates.