

COLLINS kineplex[®]
systems

KINEPLEX DATA SYSTEMS

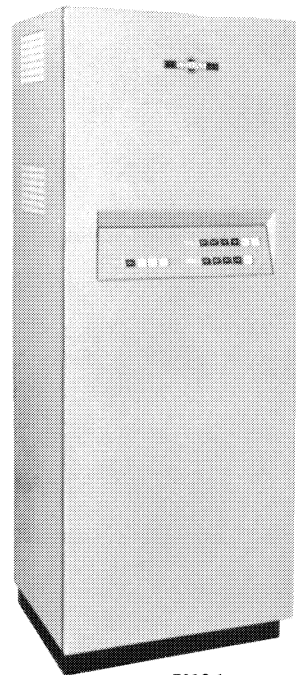
TE-206 DATA COMMUNICATION SYSTEM — Data transmission rates up to 2400 bits per second can be achieved with the compact, flexible TE-206 Data Communication System. Utilized for conveying digital data at voice frequencies over wire line, cable, carrier or microwave telephone facilities, this equipment is completely transistorized. With applicable conversion equipment, the TE-206 may be employed for transmission of binary record information from teletypewriters, punched cards, computers, magnetic tape, facsimile and other special purpose data equipment.

Data is synchronously encoded into phase shift modulation of four equally spaced tones operating in the frequency region of 21 kc. Each tone is encoded with data from two input channels. A single channel will convey 300 bits per second. Since eight channels are employed, the maximum data rate is 2400 bits per second.

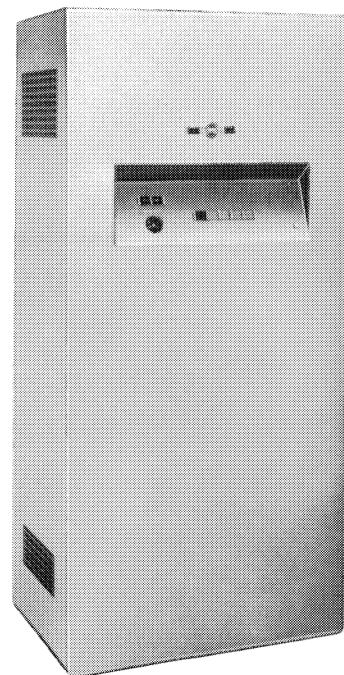
After the tones have been phase shifted in accordance with the incoming data, they are heterodyned to the audio region. The audio frequency spectrum was selected for transmission over the above communication facilities taking into account frequency and delay characteristics of each. Synchronism between the transmitting and receiving terminals is established through the use of a system of amplitude modulation of the composite four audio tones.

At the receiving terminal, the received audio tones are retranslated to the 21 kc region for detection using predicted wave techniques. After detection, the data is regenerated and delivered synchronously to the data conversion equipment.

Data Input: Eight parallel channels, each with 300 bits per second synchronous data, 0 volts for "Space" (or "0") and -6 volts for "Mark" (or "1"). Input "Mark" line current 10 ma nominal. Input is single wire to ground. **Output to Wire Line:** (Transmit Terminal) Composite signal including the four channel frequencies. Peak level may be varied from -45 dbm to 0 dbm into a 600 ohm nominal or 1135 ohm nominal line. **Input from Wire Line:** (Receive Terminal) Composite signal including the four channel frequencies. Peak input level -0 dbm to -20 dbm from 600 ohm nominal or 1135 ohm source at 1000 cps. Composite signal is amplitude modulated 3 db down from nominal received with 150 cycle square wave. **Data Output:** Eight parallel data channels, each with 300 bit per second synchronous digital data, 0 volts for "Space" (or "0") and -6 volts for "Mark" (or "1"). "Mark" line current 10 ma nominal. Output may be 2-wire or single wire to ground. **Synchronization:** Obtained from amplitude modulation of the composite audio envelope at the data transition rate of 150 cps. **External Timing:** TE-206 transmitting terminal may be synchronized from external source that provides a synchronizing frequency of 600 ± 0.6 cps. TE-206 arranged to furnish a 300 ± 0.3 cps square wave to external transmitting converter at 0 to -6 volt levels for readout control. TE-206 receiving terminal furnishes a 300 ± 0.3 cps square wave at 0 and -6 volt levels for synchronizing the received data. **Data Rates:** Channel data rate - 300 bits per second. Maximum data rate - 2400 bits per second. **Frequency Control:** ± 10 cps translation error allowable. **Audio Channel Frequencies:** Channels 1 and 2 - 935 cps. Channels 3 and 4 - 1375 cps. Channels 5 and 6 - 1815 cps. Channels 7 and 8 - 2255 cps. **Power Requirements:** 115 $\pm 10\%$ v, 1 phase, 60 cps, 100 watts. **Environmental Conditions:** Temperature -



768G-1



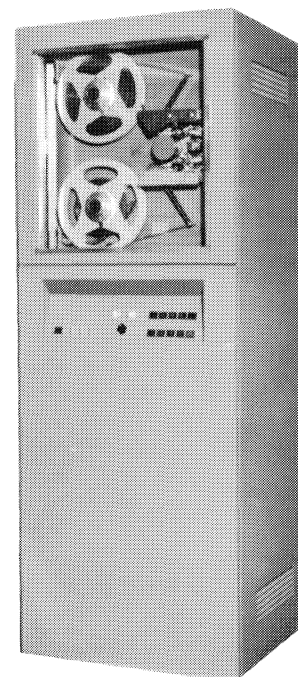
TE-206

16°C to 43°C (60°F to 110°F). Humidity - 0 to 90% without condensation.

768G-1 KINECARD CONVERTER — The completely transistorized 768G-1 Kinecard Converter is employed for reproduction and transmission of IBM punched card information at a rate of 100 cards per minute. The converter is used in conjunction with an IBM card reader/punch unit and the Collins TE-206 Data System, and is capable of operating in half-duplex or full-duplex modes. The card reader supplies information to the Kinecard Converter, which translates the information and applies it to the eight channels in the TE-206 transmit terminal. Information from the eight channels in the TE-206 receive terminal is stored in the Kinecard Converter until sufficient information is available to supply to the card punch unit. Errors in data assembly and transmission are detected by odd and even parity checks on each card. Erroneous cards are isolated by offset stacking. **Card Speed:** 97 to 100 cpm. **Storage:** Core matrix (576 bits). **Associated Equipment:** TE-206 Data System and IBM 523 Gang Summary Punch. **Operating Modes:** Half-duplex. Full-duplex by addition of an IBM 523. **Checking:** Odd and even parity, 16 bits for each card. **Controls:** Power On-Off. Transmit - Start, Stop, Reset, Test. Receive - Start, Stop, Reset, Test, Card Offset. **Power Requirements:** 115 $\pm 10\%$ v, 1 phase, 60 cps, 300 watts. **Environmental Conditions:** Temperature - 16°C to 43°C (60°F to 110°F). Humidity - 0 to 90% without condensation.

768H-1 KINETAPE CONVERTER — The completely transistorized 768H-1 is utilized for the reproduction and transmission of magnetic tape information at a maximum rate of 300 eight-bit characters per second. It will accept either 1500 or 2500 foot Remington-Rand Uniservo reels of 1/2" width mylar magnetic tape. This converter is used in conjunction with

	Type	Dimensions (inches)			Weight (lbs.)	Channels	Operational Rate
		W	D	H			
Kineplex Data System	TE-202	41	20	86½	400	40	75 bits per second per channel 3,000 bits per second total
Kineplex Data System with Teletypewriter Converters	TE-202	41	20	86½	700	40	60, 75 or 100 words per minute per channel
Kineplex Data System	TE-206	25	18	58	175	8	300 bits per second per channel 2,400 bits per second total
Kinecard Converter	768G-1	25	20	66	300		100 cards per minute
Kinetape Converter	768H-1	25	20	66	350		300 eight-bit characters per second
Kinetape Converter	768H-2	25	20	66	350		300 seven-bit characters per second



768H-1, -2

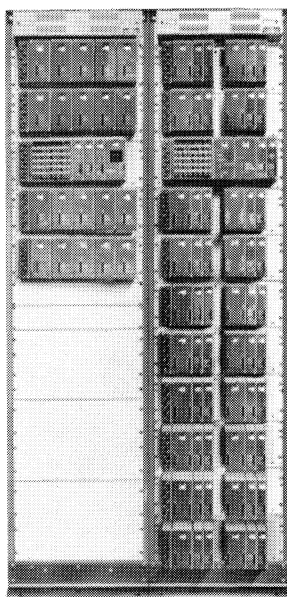
the TE-206 Data System, and it operates in the half-duplex mode. The data may be recorded on the tape in either of two standard, expanded Univac formats. The tape handler operates at either of two tape speeds to provide optimum transmission efficiency for each of the standard data formats. Errors in data assembly or transmission are detected by parity checks, and corrections are made by automatic retransmission of the blockette containing the error.

Data Format — Type 1: Blockette Length — 120 characters. Blockette Spacing — 1" minimum. Saturated to zero level state. Character Density — 128 \pm 5% characters per inch. Block Length — May be any number of 120 character blockettes. Block Spacing — 1" minimum. Saturated to zero level state. **Type 2:** Blockette Length — 120 characters. Blockette Spacing — 0.1" minimum. Saturated to zero level state. Character Density — 128 \pm 5% characters per inch. Block Length — 6 blockettes. Block Spacing — 1" minimum. Saturated to zero level state. **Tape Speed — Format 1:** 4.6 inches per second. **Format 2:** 2.3 inches per second. **Stop Time:** 3 msec. **Start Time:** 3 msec. **Reverse Time:** 6 msec. **Heads:** Velocity reading and recording, 8 tracks staggered. **Tape Characteristics:** ½" by 1½ mil mylar. Tape is to be pretested for absence of dropouts. **Recording Method:** RZ. **Error Detection and Correction:** Both lateral and longitudinal parity with automatic correction. **Operating Mode:** Half-duplex. **Associated Equipment:** TE-206 Data System. **Controls:** Power On-Off, Override, Retransmission, Reset. Tape forward, Tape Reverse, Stop, Tape Fast Forward, Tape Fast Reverse, Tape Auto. **Power Requirements:** 115 \pm 10% v, 1 phase, 60 cps, 500 watts. **Environmental Conditions:** Temperature — 16°C to 43°C (60°F to 110°F). Humidity — 0 to 90% without condensation. **Weight:** 350 lbs. total for a half-duplex unit complete with power and cabinet. **Dimensions:** Cabinet — 25" W, 66" H, 20" D.

768H-2 KINETAPE CONVERTER — The 768H-2 is another transistorized converter for the reproduction and transmission of magnetic tape information at a maximum rate of 300 seven-bit characters per second. It will accept 2400 foot IBM 727 reels of ½" width mylar magnetic tape. The converter is used in conjunction with the TE-206 Data System, and it operates in the half-duplex mode. Data may be recorded on the tape in the standard IBM format. The tape handler operates at a speed to provide optimum transmission efficiency. Errors in data assembly or transmission are detected by parity checks, and corrections are made by automatic retransmission of the record containing the error.

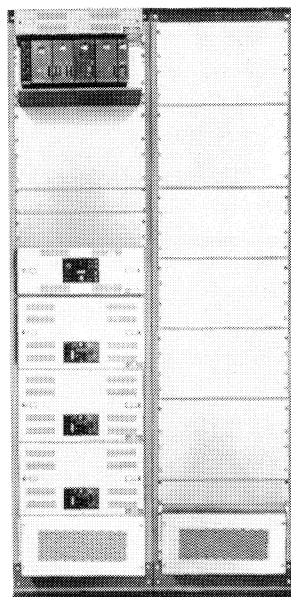
Data Format: Record Length — 120 characters plus longitudinal check character. Record Gap — ¾" minimum. No flux transitions are to occur during the gap period. Character Density — 200 +0% -30% characters per inch. File Length — May be any number of 120 character records. **File Gap** — ¾" minimum. No flux transitions are to occur during the gap period. **Tape Speed:** 3" per sec. **Stop Time:** 3 msec. **Start Time:** 3 msec. **Reverse Time:** 6 msec. **Heads:** Velocity reading and recording, 7 tracks in line gap. **Tape Characteristics:** ½" by 1½ mil mylar. Tape is to be pretested for absence of dropouts. **Recording Method:** NRZI. **Error Detection and Correction:** Both lateral and longitudinal parity with automatic correction. **Operating Mode:** Half-duplex. **Associated Equipment:** TE-206 Data System. **Controls:** Power On-Off, Override, Retransmission, Reset. Tape Forward, Tape Reverse, Stop, Tape Fast Forward, Tape Fast Reverse, Tape Auto. **Power Requirements:** 115 \pm 10% v, 1 phase, 60 cps, 500 watts. **Environmental Conditions:** Temperature — 16°C to 43°C (60°F to 110°F). Humidity — 0 to +90% without condensation. **Weight:** 350 lbs. total for a half-duplex unit complete with power and cabinet. **Dimensions:** Cabinet — 25" W, 66" H, 20" D.

KINEPLEX DATA SYSTEMS

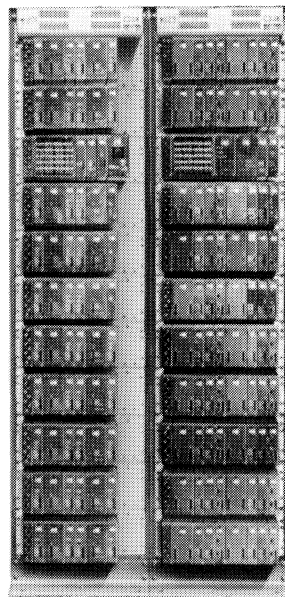


Front

TE-202 Data Communication System

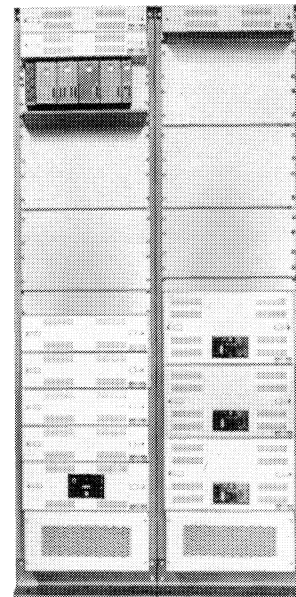


Back



Front

TE-202 with Teletypewriter Converters



Back

TE-202 DATA COMMUNICATION SYSTEM—The completely transistorized TE-202 Data Communication System provides an efficient and flexible high speed, high capacity data link for conveying binary information over radio circuits under adverse conditions, as well as over wire line, cable, carrier or microwave telephone facilities. When employed with appropriate conversion equipment, the data system will accept and transmit binary information for such record media as teletypewriter, punched cards, magnetic tape, facsimile and other special purpose equipment.

The basic communication channel on radio and wire line facilities has a nominal bandwidth of 3 kc. The TE-202 has been designed to maximize the utilization of this basic channel. The system is comprised of channeling equipment which may be added in multiples of two channels to a maximum of forty channels. A single channel will convey 45, 56 or 75 bits per second, and channels may be connected in series-parallel or parallel-series arrangements to provide for a transmission of data up to a maximum of 3000 bits per second in a 3 kc voice channel.

Forty channels of 60, 75 or 100 word-per-minute start-stop teletypewriter information may be transmitted simultaneously on 20 tones. On teletypewriter service this represents more than twice as many channels on a 3 kc band as compared with present day carrier telegraph systems.

To be efficient, integrated data processing centers incorporating high speed electronic computers will be dependent on the fast transmission of business data to the data processing center from the remote points. The TE-202 provides an efficient and flexible high speed data link for transmitting this information. Magnetic tape input/output storage is ideally suited for these applications; however, punched card, paper tape and other types of storage may be adapted for use with the TE-202. The total data transmission capacity of the TE-202 may be divided between different services as best fits the requirements.

Transmit Input: 40 parallel synchronous data signals each operating at maximum of 75 bits per second, -23 v dc for a "mark," -13 v dc for a "space," unbalanced grounded, 10,000 ohm input circuits. *Transmit Output:* Composite signal of 21 audio tones with a range of 605 cps to 2915 cps at a level of -15 dbm to $+2$ dbm. *Receive Input:* Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of -11 dbm to -45 dbm. *Receive Output:* 40 parallel synchronous data signals each operating at maximum of 75 bits per second, -23 v dc for a "mark," -13 v dc for a "space," unbalanced grounded. *Power Input:* Synchronous Data Transmission Equipment—8 amps at -27.5 v dc or 700 watts at 115 v, 1 phase, 60 cps. *Operating Conditions:* Fixed station, $0-45^{\circ}\text{C}$ ambient, humidity to 95%.

TE-202 WITH TELETYPEWRITER CONVERTERS—With Teletypewriter Converters, the TE-202 consists of two racks of synchronous data transmission and converter equipment as required for teletypewriter or data applications. *Transmit Input:* Non-synchronous dc telegraph "start-stop" signals, -20 or -60 ma for a "mark," 0 for a "space." *Transmit Output:* Composite signal of 21 audio tones with a range from 605 cps to 2915 cps at a level of -15 dbm to $+2$ dbm. *Receive Input:* Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of -11 dbm to -45 dbm. *Receive Output:* Non-synchronous dc telegraph "start-stop" signals, ungrounded, 120 v across 2000 ohms for a "mark," 0 for a "space." *Channels:* 40 channels maximum, 60, 75 or 100 wpm each. *Power Input:* Synchronous Data Transmission Equipment—8 amps at -27.5 v dc or 700 watts at 115 v, 1 phase, 60 cps. Teletypewriter Converter Equipment—3 amps at -27.5 v dc or 250 watts at 115 v, 1 phase, 60 cps. *Total Power Input:* 115 v, 1 phase, 60 cps, 950 watts, or 11 amps at -27.5 v dc.