WIDEBAND DATA STATIONS
X303A TYPE

INTERFACE
SPECIFICATION
PRELIMINARY

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October 1964

Bell System Data Communications

TECHNICAL REFERENCE MANUAL

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Wideband Data Stations
X303A10, X303A20 and X303A30 Types

Interface Specification

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October 1964

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Preliminary

DATA AND TELETYPEWRITER PLANNING ENGINEER

PREFACE

This specification refers specifically to the Model Shop versions of wideband data stations, types X303A10, X303A20 and X303A30. This specification is subject to revision as dictated by results of tests with the Model Shop Units.

Revised specifications will be published as appropriate.

Latest technical information may be obtained from:

Data and Teletypewriter Planning Engineer
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195 Broadway
New York 7, New York

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Preliminary Interface Specifications

General

This specification describes preliminary interface arrangements for "model shop" wideband data stations, types X303A10, X303A20 and X303A30, for use in the transmission of serial binary synchronous or nonsynchronous data over half-group, group and supergroup facilities respectively. These specifications are subject to change in final production units which are currently under development.

When operated in the nonsynchronous mode, these data systems will accept nonsynchronous signals with a minimum signal element width of:

52 microseconds for	half-group (X303A10)
20 microseconds for	group (X303A20)
4.3 microseconds for	supergroup (X303A30)

The clock speeds selected for the synchronous mode of operation of model shop units are:

19.2 kilobits/second for	half-group (X303A10)
50 kilobits/second for	group (X303A20)
230.4 kilobits/second for	supergroup (X303A30)

These clock speeds were selected on the basis of providing the highest bit rate consistent with good performance. However, of necessity, they were chosen in advance of an adequate program of field testing which is now underway. It is possible that after experience is gained from field tests and trials that clock speeds will have to be changed.

The nonsynchronous mode of operation is used with nonsynchronous serial devices such as 2-level black and white baseband facsimile equipment. The synchronous mode is used with synchronous serial equipment such as magnetic tape terminals and computers. A data station that is equipped with a clock for fixed-speed synchronous operation can also be operated in the nonsynchronous mode by the application of an "ON" signal at the interface between the business machine equipment and the data station equipment. This arrangement is attractive from the customers' standpoint since it becomes possible to operate with magnetic tape terminals and facsimile equipment, for example, on an alternate use basis, using the same data station equipment. As noted below, for model shop production, both synchronous and nonsynchronous (without clock or bit sync recovery) versions of data sets are available.

The wideband data stations consist of a wideband data set together with equipment for the transmission of voice or control signals over an associated voice frequency coordination channel. This equipment is normally housed in a cabinet as shown in Figures 1 and 2 and is located near the business machine equipment on the customer's premises. The wideband data station is arranged to provide full duplex service on both the wideband facilities and on the voice frequency coordination channel.

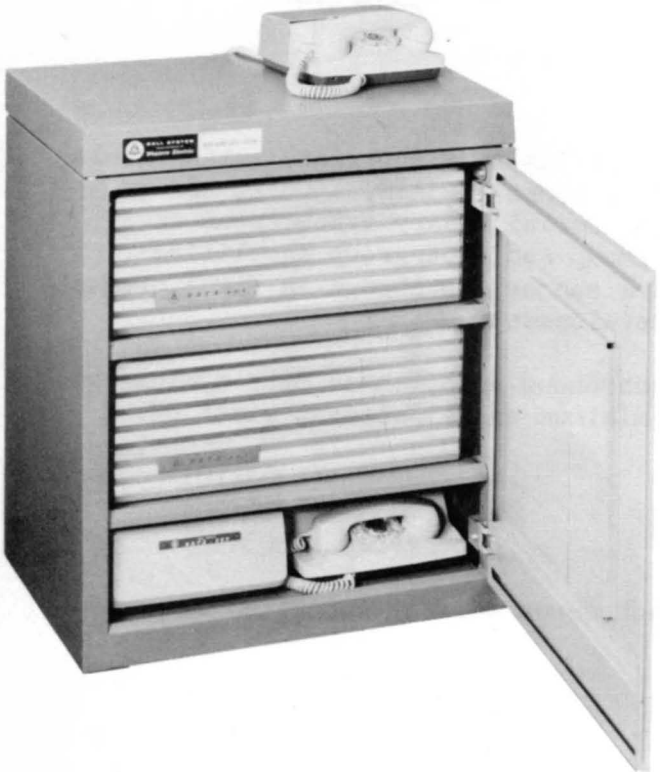

Figure 1
Wideband Data Station - Front

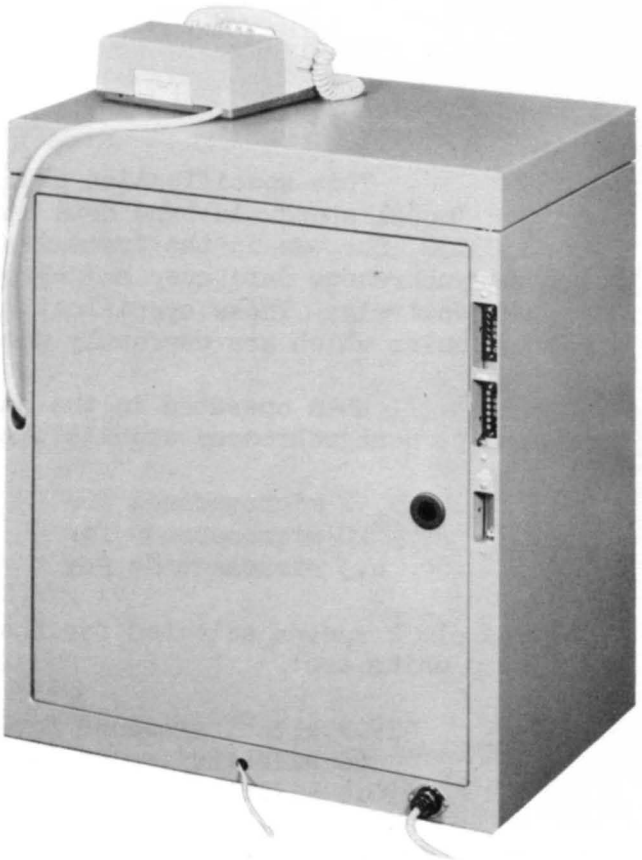

Figure 2
Wideband Data Station - Rear

The wideband data sets for all three transmission bands are basically alike, differing only in speed and frequency determining components. Therefore, a common code has been chosen to facilitate manufacturing and field use. The basic code is 303A with two digit suffixes to denote the transmission band: 10 for half-group, 20 for group and 30 for supergroup. (11-19, 21-29 and 31-39 are reserved for future use in these bands). Also, letter suffixes are assigned to cover synchronization and filter options. A and C are non-synchronous depending on the filter used, while B and D are synchronous depending on the filter. (Filter options will be selected by Telephone Company on the basis of the makeup of transmission facilities.) And, lastly, for Model Shop production, the letter "X" will precede the code with (M10) following the code. Thus, a Model Shop Group Band Data Set capable of synchronous operation (with a 50% roll-off filter) is coded X303A20B(M10). For convenience this data station can be referred to as the Data Station X303A20-type.

Some wideband systems require slow speed control functions in each direction and these will be provided for by the use of standard Voiceband Data Sets over the voice frequency coordination channel. In the model shop versions, low speed parallel transmission is used for these coordination signals. A standard Voiceband Data Auxiliary Set of the 804-type will be used

on the voice frequency coordination channel for talking, control of the low speed and wideband data sets, and other control functions. This Data Auxiliary Set makes it possible to arrange the wideband data station for dialing and for unattended answering of calls where the station is one of a number on a switched wideband private line network.

The Data Sets X303A-Type condition the baseband signals for optimum performance over the various types of local and toll facilities encountered in telephone plant. Local cables must be specially conditioned and require the use of wideband amplifiers and equalizers to provide flat response over the required bandwidth. Where carrier systems are involved in either local or toll facilities, special wideband modulators and demodulators are used to handle the frequency spectrum of these half-group, group and supergroup services. They replace the voice channel units normally used on these carrier systems. The wide frequency spectrum that must be made available for these services requires that large numbers of voice channels be reassigned to other facilities. Because of the high degree of custom engineering and the installation of special equipment, these wideband services take a considerable amount of time to provide. In view of this fact, the prospective customer should contact the Telephone Company at the earliest possible time in his planning stages for any of these wideband services.

The following paragraphs in this section relate to the use of "scramblers" and "descramblers" in the data sets when used with synchronous business machines.

Wideband transmission systems are particularly susceptible to single frequency tone interference. When the power in a given carrier system is concentrated into a few single tones, there is the liklihood of crosstalk into other carrier systems in the same transmission cross section. Strong single frequency sidebands are produced by the data systems described in this Technical Reference if any repeated bit pattern such as alternate ones and zeroes is transmitted continuously. Scramblers and descramblers are employed in the data sets in the synchronous mode in order to eliminate this possibility.

The serial data stream from the business machine at the transmit end is combined in the data set with a repeating semi-random word. Thus, the transmitted data approaches a random pattern even if the business machine sends alternate ones and zeroes continuously. This scrambling effectively spreads the transmitted energy over the entire frequency spectrum of the carrier system and eliminates any predominant single tone. At the receiving end, the incoming data stream is descrambled so that the resultant data output to the receiving business machine is the same as that produced by the business machine at the transmit end.

It is felt that facsimile type signals will not present this problem of single frequency tone interference due to their inherent random nature. However, the use of screens or cross hatching on facsimile copy may cause serious interference problems. Scrambling cannot be used to break up these repeating patterns since

scrambling cannot be accomplished in the nonsynchronous mode.

The Wideband Data Station

The wideband data station will normally be housed in a cabinet as shown in Figure 1. In some installations, however, only the wideband data set shown in Figures 3 and 4 will be required. A simplified block diagram of the wideband data station is shown on Figure 7. A complete wideband data station will include all or some of the following items:

A Wideband Data Station Cabinet - Data Auxiliary Set X807A1(M10)

This cabinet (Figures 1 and 2) contains cables and wiring to interconnect the units that make up the complete wideband data station. A set of interface connectors for the Wideband and the Voiceband Data Sets appear on the rear of the cabinet to accommodate the plugs of the business machine cables as shown in Figure 2. Connection to the units within the cabinet is made by means of factory installed cables.

A Data Set X303A Type

The wideband data set is shown located on the top shelf of the cabinet in Figure 1. A detailed description of the interface signals is given on the following pages. Front and rear views of the 303A-type data set are shown on Figures 3 and 4. The cable shown leaving the rear of the data set is used in connecting to other units within the wideband cabinet. From left to right, the four connectors shown on the rear of the data set along the bottom are: (1) for connection to telephone facilities, (2) for connection to the VSB unit described below if required, (3) for connection to synchronous business machines and, (4) for connection to nonsynchronous business machines. The receptacle for the detachable power cord is also shown.

A Vestigial Sideband Unit - Data Auxiliary Set X809A10(M10)

This unit is shown on the second shelf of the wideband data station cabinet in Figure 1. At present, the half-group data station is the only one which will require the VSB modulator-demodulator. This unit modulates the output of the 303A10-type data set to the proper band for transmission over half-group facilities.

An Interface Adapter Unit - Data Auxiliary Set X808A1(M10)

This unit provides a voltage interface as specified in Electronic Industries Association Standard RS-232A for the standard Data Set 401J which normally has a contact closure type of interface. This unit includes the oscillator of the Data Set 401E transmitter with a voltage interface. It is needed where a number of slow speed control functions are required, as with certain facsimile equipment. It is shown located on the bottom-left of Figure 1.

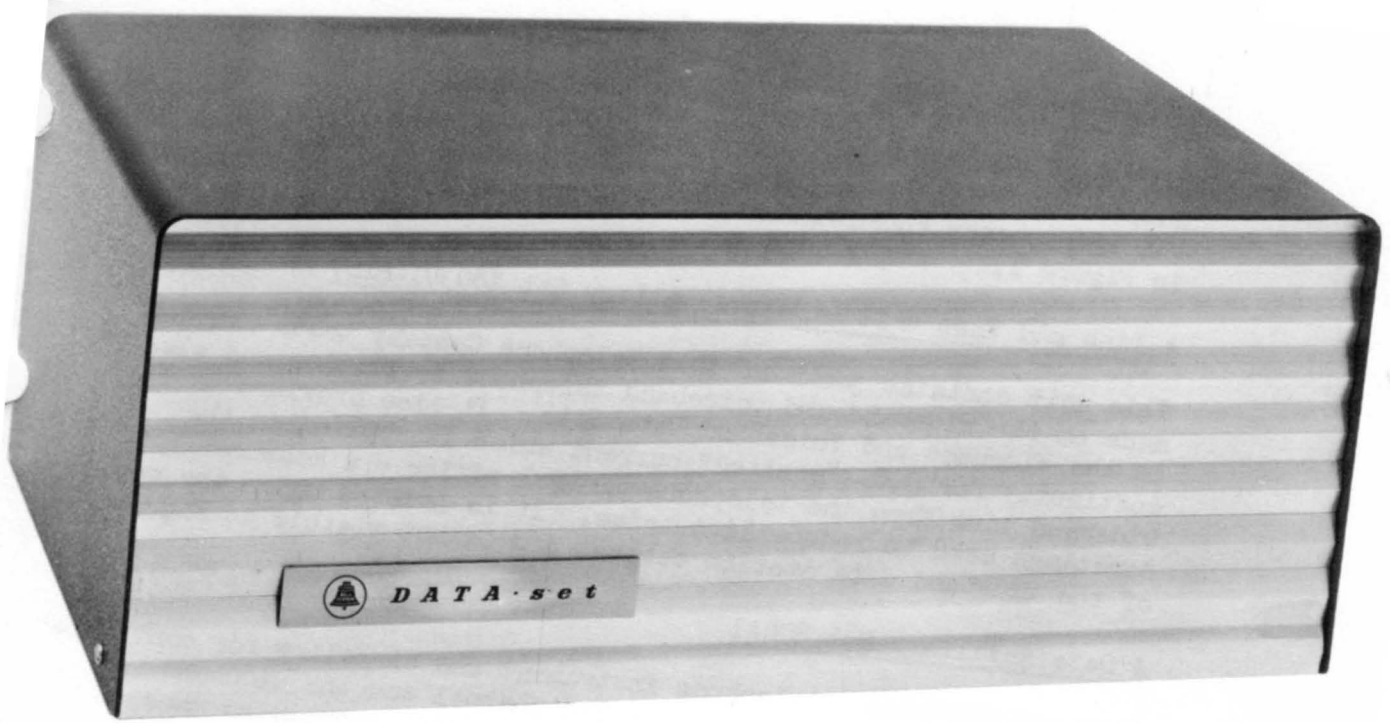

Figure 3 - Data Set X303A-Type - Front

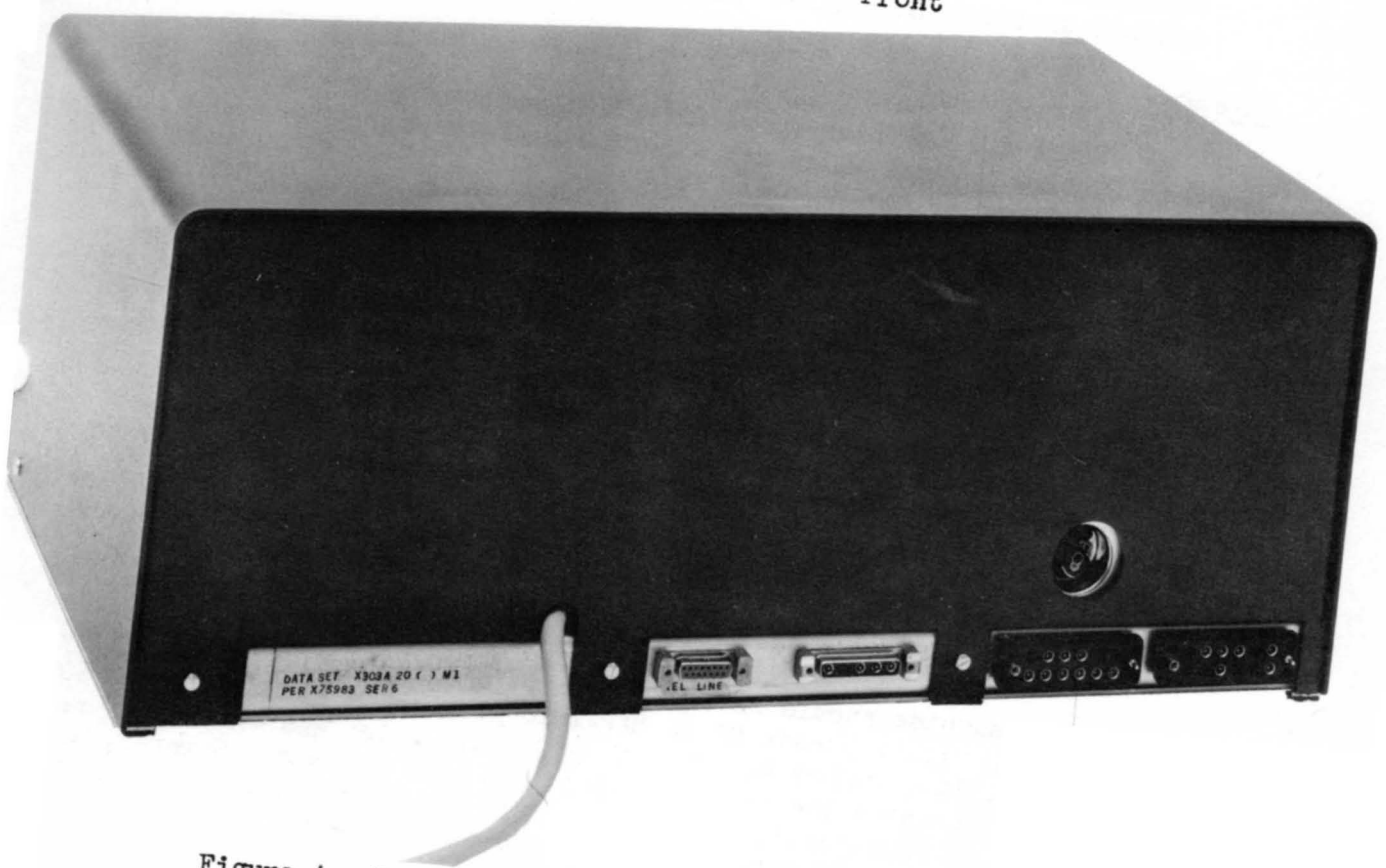

Figure 4 - Data Set X303A-Type - Rear

A Data Set 401J-Type

This data set receiver is used in conjunction with the interface adapter unit described above to provide control functions over the voice frequency coordination channel. It is the bottom-right unit in Figure 1.

A Line and Test Unit - Data Auxiliary Set X803D1(M10)

This unit contains jacks so that Telephone Company tests can be made on the wideband and voiceband telephone facilities and also on the Wideband and Voiceband Data Sets. It also provides continuity for D.C. "sealing" current which is applied on the wideband line from the telephone central office - a measure sometimes used to reduce line noise. It is located under the cover of the wideband data station cabinet and is not visible in Figure 1.

A Data Auxiliary Set 804A1

This set provides a telephone instrument and circuitry for controlling the voice frequency coordination channel and the wideband facilities. It will normally be placed near the business machine equipment and can be placed on top of the wideband data station cabinet as shown in Figures 1 and 2, if desired.

Interface

There are two high-speed interface connectors at the rear of the Data Station Cabinet which are extensions of the connectors that appear on the rear of the Wideband Data Set. One is for synchronous operation, the other is for nonsynchronous operation. Note that the "ON" signal (23 ma) must be held on Pin A of the "NON SYNC" connector to operate in the nonsynchronous mode. This is true even if the data set is not equipped for synchronous operation. There is also a low speed interface connector at the rear of the Data Station Cabinet for use when business machine control signals are transmitted over the voice frequency coordination channel and for access to the Data Auxiliary Set 804A1.

The High-Speed Connectors

For Model Shop development of the Data Station, the 12-pin Burndy MD 12 MXR-8T coaxial connector will be used for the high speed connector.

Note: This connector may be changed in standard production units.

The business machine should be equipped with a cable not exceeding fifty feet in length with a Burndy MD 12 MXP-17TC plug and a Burndy No. M2H 50RC-1P2 protective shield. Burndy No. MB 12XP-3TC plug, which was originally recommended for use with the Data Set 301B, can also be used. However, the new connector (which is presently recommended for the 301B) is deeper and afford more contact area and is expected to be more satisfactory.

The connector labeled "Non Sync" has the following pin assignments:

A		Alternate Use
B		
C	(CS)	Clear to Send
D	(SR)	Send Request
E	(SD)	Send Data
F		
G	(LT)	Local Test
H		
J		
K	(RD)	Receive Data
L		
M		AGC Lock

The connector labeled "Sync" has the following pin assignments:

A		
B		
C	(CS)	Clear to Send
D	(SR)	Send Request
E	(SD)	Send Data
F		
G	(LT)	Local Test
H	(SCTE)	Serial Clock Transmit (External Sync. Option)
J	(SCT)	Serial Clock Transmit (Internal Sync.)
K	(RD)	Receive Data
L	(SCR)	Serial Clock Receive
M		AGC Lock

Description of High-Speed Interface Signals

The Wideband Data Set is provided with cable drivers and cable terminators which become part of the interchange circuits that interconnect the data set and the business machine. The cable drivers operate into, and the cable terminators operate from, coaxial cables of from 90 ohms to 120 ohms characteristic impedance. The interface is provided on a current switching basis and the use of coax is necessary to preserve the rise times of interface waveforms. It is expected that the business machine will be supplied with cable drivers and terminators and with the coax cables. Circuit diagrams for typical drivers and terminators are shown in Figure 5.

In the wideband data set, cable drivers are provided where signals are delivered from the data set to the connecting business machine equipment and cable terminators are provided where signals are delivered from the business machine equipment to the data set. A binary "1", control "OFF" or "marking" signal is represented by a current less than 5 ma into 100 ohms. A binary "0", control "ON" or "spacing" signal is represented by a current greater than 23 ma into 100 ohms. All interchange circuits are fail-safe in that an open circuit is considered a control "OFF" condition.

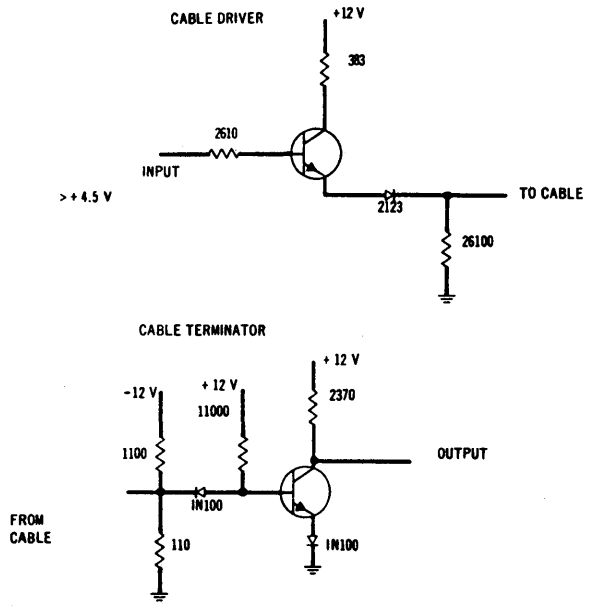

Figure 5 - Typical Cable Drivers and Cable Terminators

The above-mentioned currents are supplied at the output of the cable drivers. With less than 5 ma into 100 ohms supplied to a cable terminator, the terminator input voltage is more negative than -0.7 volts. The negative voltage is added by a bias in the terminator. With greater than 23 ma into 100 ohms supplied to a cable terminator, the terminator input voltage is more positive than +1.0 volts. An open circuit must be recognized by a terminator as "OFF", as mentioned above.

A description of signals from the business machine equipment to the data communication equipment follows:

1. Alternate Use

The "Alternate Use" circuit is a control circuit that selects the mode of operation and activates the appropriate high speed connector. The control is from the Data Processing Equipment to the data station. If the circuit is in the "ON" condition, the nonsynchronous mode is selected and the "Non Sync" connector is active. If the circuit is in the "OFF" condition (or if the circuit is open) the synchronous mode is selected and the "Sync" connector is active.

2. (SR) Send Request

The Send Request circuit can be permanently wired in the "ON" condition by the business machine equipment. It must be

in the "ON" condition to send or receive wideband data.

3. (SD) Send Data

The Send Data circuit is designed to accept serial binary data from the customer's data equipment. For nonsynchronous service, these signals can be as short as 52, 20 and 4.3 microseconds in length for half-group, group and supergroup services respectively.

For synchronous service, this data will be timed by the "internal" serial clock or by the "external" clock from the business machine. In either case, the data must be changed at the positive going transition of the timing signal. The data signal should be maintained on the Send Data circuit for the full bit period duration. The data is sampled by the data set coincident with the negative going transition of the timing signal. The speeds for synchronous operation, for Model Shop data sets, have been established as follows:

Half-group band service - 19.2 kilobits per second
Group band service - 50 kilobits per second
Supergroup band service - 230.4 kilobits per second

These clock speeds are subject to change in final production.

4. (LT) Local Test

This circuit provides for electrical control of looping both the wideband data set and the voiceband data sets on the line side. When the data sets are in the local test mode, the telephone lines are terminated. An "ON" condition causes the data station to go into the local test mode. This permits the business machine equipment to send to itself through the data set for local testing. In addition to this interface lead control, a button on the Data Auxiliary Set 804A1 performs this function on a manual basis. Any time the local test circuit is operated a lamp lights under the local test button on the 804A1.

5. (SCTE) Serial Clock Transmit (External Sync Option)

The SCTE circuit is used only in synchronous service and only when the data set is to be driven by the customer's clock signal. When operated in this manner, the customer's timing source must supply a square wave with a 50% ±5% duty cycle at a rate equivalent in cycles to the bit rate. For example, the clock for 230.4 kilobit operation would be 230.4 kilocycles. The frequency tolerance requirement is .01% on external

clocks. Positive going transitions of the clock signal and the transitions of the data signal should be coincident (within 10% of the bit interval). The data will be sampled by the data set coincident with the negative going transition of the SCTE signal.

A description of the signals from the data communication equipment to the business machine equipment follows:

1. (CS) Clear to Send

This control signal from the wideband data set is the logical AND of a signal from the wideband data set and the Data Auxiliary Set 804A1 on the voice frequency coordination circuit. It will indicate that both are in a condition that will permit the transmission of data. For nonsynchronous services such as facsimile where 401 type data sets are used, it is not possible to talk on the voice line at the same time that control signals are being transmitted between 401's. Therefore, Clear to Send "ON" also indicates that the voice frequency coordination circuit is not in the "talk" mode.

For services where no Voiceband Data Sets are employed, it is theoretically possible to talk on the voice line while wideband data is being transmitted. However, there is a possible interference problem and it is necessary to place restrictions on the use of the voice circuit while this is being investigated. This will be reported on at a later date. For Model Shop production, all data stations are arranged so that it is not possible to talk on the voice line while wideband data is being transmitted.

2. (RD) Receive Data

Received data is delivered serially on the Receive Data circuit to the customer's data equipment. In the nonsynchronous case, when random length pulses that meet the minimum pulse width requirement above are presented to the data transmitter, it is expected that the pulses delivered at the receiver will have a peak jitter of less than 34% of the minimum signal interval. This means that after the correction is made for absolute delay, a received data transition will be within ±17.7 microseconds for 1/2 group, ±6.8 microseconds for group, and ±1.46 microseconds for supergroup of where it should be as measured at the 14 ma level. Occasional jitter in excess of 34% will occur under high circuit noise conditions. The rise and fall time of the received transitions will be less than 0.2 microseconds as measured between the 5 ma and 23 ma limits.

For synchronous operation the received data pulses will be regenerated and therefore in phase with the received serial clock. The rise and fall time of the received data transitions will again be less than 0.2 microseconds. The jitter of the received serial clock is expected to be less than 10%. The negative clock transition will be centered ±10% in the nominal bit interval.

3. AGC Lock

Incoming signals received by the data station are monitored by the AGC Lock circuit. An "OFF" indication on this interface lead indicates that signals on the Receive Data circuit probably contain errors.

4. (SCT) Serial Clock Transmit (Internal Sync Option)

This function will be used only in synchronous service. The SCT (Internal Sync Option) is used by the customer when the data set supplies the timing signal. When operated in this manner, the data set supplies a square wave with a 50% ±5% duty cycle at a rate equivalent in cycles to the bit rate. For example; the clock for 230.4 kilobits per second would be 230.4 kilocycles per second. (Plus or minus .01%). The customer must change data on the SD circuit coincident (within 10% of the bit interval) with the positive going transition of the SCT as measured at the data set connector. (This means that the business machine designer must take into account the round trip delay of the coaxial cable.) The data is sampled by the data set coincident with the negative going transition of the SCT signal.

5. (SCR) Serial Clock Receive

This signal applies only to synchronous operation. The Data Set Receiver derives a bit synchronization signal by means of using transitions in the received data to correct a local oscillator. The data on the RD lead will be changed coincident (within .3 microseconds) with the positive going transition of SCR. The customer's business machine should sample the received data on the RD lead coincident with the negative going transition of the SCR signal.

As mentioned under Paragraph 2 covering the Receive Data circuit, the received serial clock may suffer jitter. A jitter of less than 10% is expected. The negative clock transition will be within ±10% of the center of the nominal bit interval.

Low-Speed Connector

This connector is associated with Voiceband Data Sets and

Data Auxiliary Sets that operate over the voice frequency coordination channel. The voice frequency coordination channel is used for voice communication and alternately for the transmission of low speed data signals to control business machine equipment when required.

For Model Shop and for standard production the 25-pin connector, commonly associated with Bell System Voiceband Data Sets, will be used. This connector is equivalent to a Cinch or Cannon DB-19604-433 Connector. The business machine should be equipped with a cable not longer than 50 feet and a Cinch or Cannon DB-19604-432 Plug mounted in a Cinch DB-51226-1 Hood Assembly.

The Model Shop data station will employ, on an optional basis, 401-type parallel voiceband data sets for the transmission of control signals and an 804-type Data Auxiliary Set. Pin assignments for the low speed connector are listed below:

1 Protective Ground
2 Transmit A1
3 Transmit A2
4 Transmit A3
5 Transmit A4
6 Data Set Ready
7 Signal Ground
8 Transmit B1
9 Reserved for Telephone Company Testing
10 Reserved for Telephone Company Testing
11 Transmit B2
12 Transmit B3
13 Transmit B4
14 Receive A0
15 Receive A1
16 Receive A2
17 Receive A3
18 Receive A4
19 Receive B0
20 Data Terminal Ready
21 Receive B1
22 Ring Indicator
23 Receive B2
24 Receive B3
25 Receive B4

If control signals are not required, the 401-type data sets will be omitted. The 804-type data auxiliary set may still be provided for the purpose of automatic answering on a switched private line system and/or for other control functions. Pins 1, 6, 7, 20 and 22 will be used in this case. If automatic answering is not required, Pins 1, 6 and 7 may be used.

Description of Low Speed Signals

The electrical characteristics of all low speed signals conform to those outlined in Electronic Industries Association Standard RS-232A. (An interface adapter is incorporated in the wideband station to change the contact closure-type interface of the 401-type data sets to the EIA voltage-type interface.) These characteristics are described briefly in the following paragraphs.

The eight Transmit and ten Receive Circuits will be considered Control Circuits as well as the Data Set Ready, Data Terminal Ready and Ring Indicator Circuits. A control signal is considered in the "ON" condition when the voltage on the circuit is more positive than +3 volts with respect to signal ground and the signal is considered in the "OFF" condition when the voltage is more negative than -3 volts with respect to signal ground.

The maximum open-circuit voltage to either Protective Ground or Signal Ground on any interchange circuit should not exceed 25 volts, and the maximum short-circuit current flow between any two conductors (including grounds) should not exceed one-half ampere.

The terminating impedance of the receiving end of interchange circuits should have a d-c resistance of not less than 3000 ohms, and the voltage in open-circuited condition should not exceed -2 volts. The source impedance of the sending end of interchange circuits is not specified.

In some applications, it may be necessary for fail-safe operation to detect either the power-off condition in the data set or the disconnection of the interconnecting cable. Data Set Ready may be used for this purpose. The power-off source impedance of the sending end of this circuit is not less than 300 ohms.

Description of 401-Type Data Set Signals

The eight Transmit circuits in the interface are provided in two signaling"channels", A and B. (There is also a Channel C which is reserved for Telephone Company use for control of the Data Transmission System.) At any given time, Channel A will send one of five signaling tones and, simultaneously, Channel B will send one of five signaling tones. These will be turned on by interface leads A1, 2, 3, 4 and B1, 2, 3, 4. A fifth tone will be sent in Channel A, if none of the four "A" interface leads are turned "ON". Similarly, a fifth tone will be sent in Channel B when all the "B" interface leads are "OFF". Thus, five signal outputs are presented at the receiver for each channel for a total of ten Receive outputs. If two or more transmit circuits are turned on in either channel, no tone will be transmitted for that channel and, of course, all five Receive outputs for that channel will be "OFF" at that time.

This arrangement, then, accepts and delivers a restricted two out of ten code allowing for twenty-five possible symbols. 401 Transmitters and Receivers will be used at both ends of the full duplex voice frequency coordination circuits, so that these control signals can be sent in both directions simultaneously.

After a transmit circuit is turned on, it will take 20 milliseconds plus propagation time for the Receiver to respond. The transmit circuits, therefore must be turned on for at least 20 milliseconds.

Description of Control Functions of Data Auxiliary Set 804A1

Data Set Ready

Signals on this circuit are generated within the data station to indicate to the business machine equipment that control signals can be transmitted through the low speed interface (to the low speed data sets).

The "OFF" condition indicates either

A. Any abnormal or test condition

B. That the voice frequency coordination channel is switched to the voice mode.

C. That the local data station is not connected to the communication channel. This applies particularly where the station is one of a number on a switched network.

The "ON" condition appears at all other times. The "ON" condition should not be interpreted as an indication of the status of any remote station or equipment. (The "ON" condition of the 804A1 is gated with a signal from the Wideband Data Set to produce the Clear to Send signal which appears at the high speed interface to indicate that transmission of data may take place.)

Data Terminal Ready

Signals on this circuit are generated within the business machine equipment to control the switching of the data station to the communication channel. The business machine equipment must hold this lead in the "ON" condition in order to permit the data station to be placed in the data mode. (This lead can be permanently wired in the "ON" condition within the data station equipment by the Telephone Company if the Data Terminal Ready function is not needed.) The "OFF" condition removes the Voiceband Data Sets from the voice frequency coordination channel for such reasons as:

A. Permitting use of business machine equipment for an alternate function.

B. Terminating a connection. This would be required where the station was one of several on a switched wideband circuit, and is wired for automatic answering. The Data Terminal Ready lead must be turned "ON" by the business machine equipment in order for the data station to answer a call automatically, and turned "OFF" to release the line (see Ring Indicator lead also).

Ring Indicator Lead

Signals on this circuit are generated within the Wideband Data Station to indicate to the business machine equipment that a ringing signal is being received from a remote station. The "ON" condition indicates that a ringing signal is being received. An "OFF" condition is maintained at all other times. This circuit is not disabled by an "OFF" condition on Data Terminal Ready.

The Ring Indicator lead will be turned "ON" for each ring on the voice frequency coordination line. It is useful when arranging a station to answer calls automatically on a wideband switched network. It follows the rings to permit the answering data terminal to prepare itself, (such as getting a motor up to a stable speed) if necessary, before the data terminal signals to answer the call by turning Data Terminal Ready "ON". When Data Terminal Ready is turned "ON", the call will be answered and Data Set Ready will be turned "ON" about 5 seconds later.

Grounds

Protective Ground

This conductor is electrically bonded to the equipment frame. It is further connected to external grounds through the power cord.

Signal Ground

This conductor establishes the common ground reference potential for all interchange circuits except Protective Ground. It is normally connected to the frame and to Protective Ground, to minimize the introduction of noise into electronic circuitry.

Power Requirements and Physical Characteristics

Commercial A.C. power is fed to the wideband data station through a ten foot detachable 3-wire power cord connected to the back of the wideband data station cabinet. The cord has a 3-wire plug for connection to

a customer-provided 105-129 volt, 60 ±.6 cycle source not under switch control and on the same AC circuit which serves the associated business machine equipment so that the same ground bus is used for both. This is necessary to prevent impulse noise potentials which might otherwise develop between grounds.

The power requirements, dimensions and weight of the individual units that make up the wideband data station are listed below. The wideband data station cabinet is finished in two-tone grey.

Items	Power Requirements	Dimensions	Weight
Wideband data station cabinet - DAS X807A1(M10)	-	31" H 26.5" W 19" D	110 lbs.
Wideband data set X303A-Type	50 watts	8.5" H 21.6" W 12.5" D	40 lbs.
VSB Unit - DAS X809A10(M10)	50 watts	8.5" H 21.6" W 12.5" D	38 lbs.
Interface adapter DAS X808A1(M10)	20 watts	5.5" H 11" W 10" D	13 lbs.
Data Set 401J type	20 watts	5.5" H 11" W 15" D	22 lbs.
Line and Test Unit - DAS X803D1(M10)	-	2.5" H 6.5" W 7.3" D	3 lbs.
Data Auxiliary Set 804A1	(powered from Int. Adapter)	4.5" H 9" W 9" D	7 lbs.

Therefore, the most complex data station would require a total of 140 watts.

Controls Accessible to the Station Attendant

The Data Auxiliary Unit 804A1 is normally used to set up a data call. The unit includes a telephone set, a manual dialing unit, and six buttons or keys and is shown on Figure 6. It is normally located near the business machine equipment and can be placed on top of the Data Station Cabinet, if desired.

There are six buttons, as described below. They are listed in order from left to right:

1. & 2. These buttons are spare and will normally be blocked up. If point-to-point ringing is needed and a key is required, one of these buttons will be used.

3. Local Test Button - a locking button that allows the station attendant to loop both the wideband data set and the voice-band data sets on the telephone line side. This permits the business machine equipment to send to itself through the data set for local testing. When this button is depressed, or when the high speed interface circuit Local Test Control is in the ON condition, the lamp associated with this button is lit. When any other button is pressed it is released.

4. Remote Test Lamp - this button is blocked up and the associated lamp is used to indicate that the station is being tested from a remote Telephone Company Data Test Center.

5. Talk Button - a locking button that should be depressed when setting up the call, and while talking. This button is released when any other button is pressed. Placing the station in the TALK mode prevents the transmission of wideband data. This is discussed under the description of the Clear to Send circuit of the high speed interface.

6. Data Button - a nonlocking button that is pressed to place the wideband data station in the data mode. This button is pressed until its associated lamp (under the button) lights. As mentioned earlier, the business machine equipment must hold the Data Terminal Ready lead in the "ON" condition in order to permit the data station to be placed in the data mode.

FIGURE 6 - DATA AUXILIARY SET 804A1

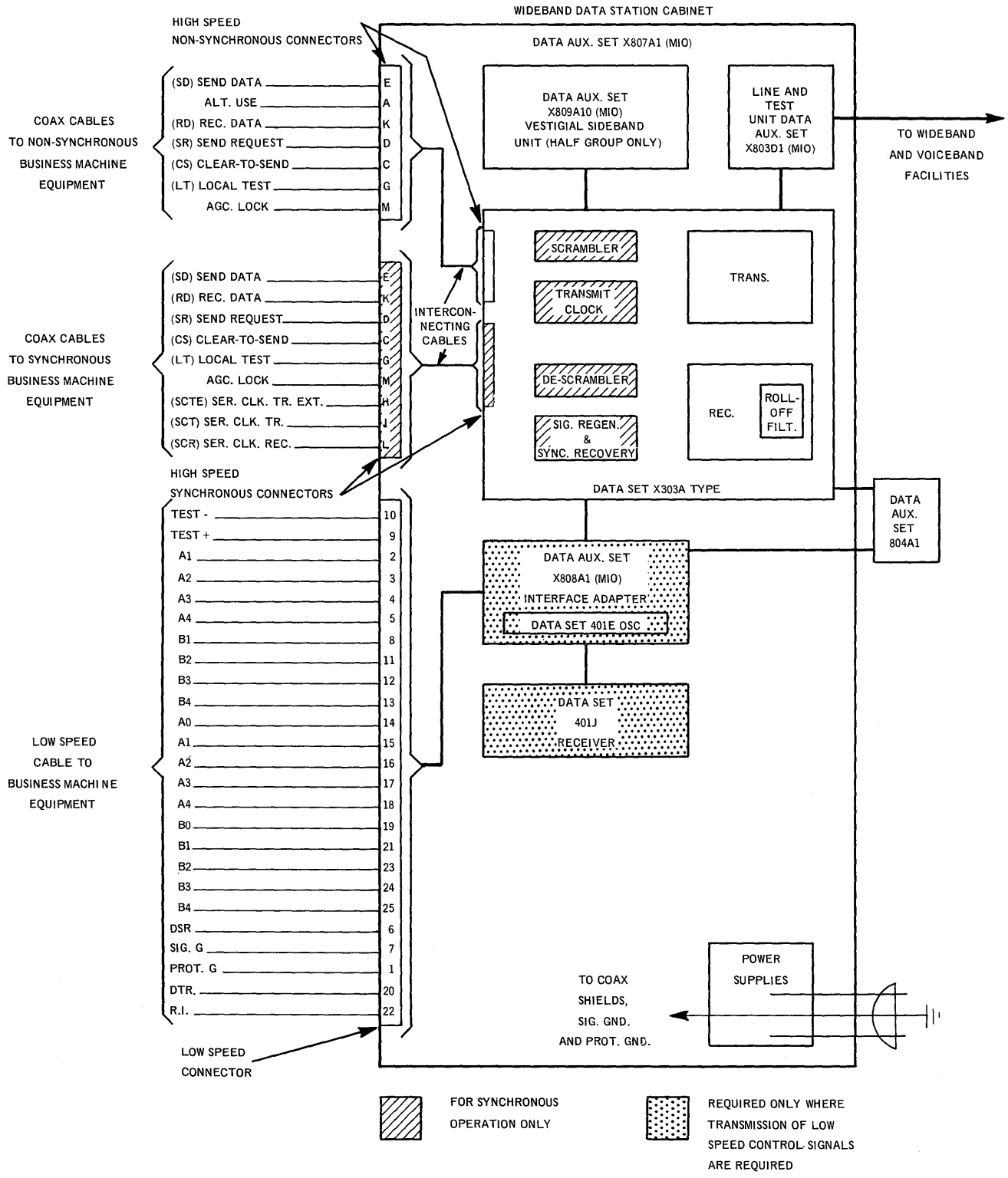

FIGURE 7

SIMPLIFIED BLOCK DIAGRAM OF WIDEBAND DATA STATION