32A-TYPE DATA UNIT

DESCRIPTION AND OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section covers the identification and operation of the 32A-type Data Unit. It does not include information concerning business machines used with the data unit.

1.02 This section is reissued to:

- Rate the 32A2 Data Unit (DU) and Data Auxiliary Set (DAS) 804A1 Manufacture Discontinued (MD)
- Replace DAS 804A1 with DAS 804A5
- Remove Figures 2, 4, 12, and 13
- Remove information pertaining to the 32A2 DU and DS 301B-type.

1.03 This section is to supplement the descriptive practices covering the components of the 32A1 DU. It is not issued as a replacement of those practices.

1.04 The 32A1 DU provides line interfacing, test features, and interconnection arrangements for the component units of the wideband data station using DS 303-type. When the 32A1 DU is used in conjunction with DS 303, it becomes an integral part of DAS 806D1. When the 32A1 DU is used in a DS 306 application, the data unit becomes an integral part of DS 306.

1.05 The data unit is not self-powered. Its operating power is obtained from the associated 26A power unit when the 32A1 DU is a component part of DAS 806D1. Its operating power is obtained from DS 306-type when it is a component part of DS 306-type.

2. PHYSICAL DESCRIPTION

2.01 The 32A1 DU (Fig. 1) consists of a single nest in which are mounted circuit packs CP AR122 and CP CS4 and a 10A3 DU. The circuit packs have identification code numbers stenciled on the faceplate. The circuit packs also have test points brought out to numbered pins on the faceplate. Refer to Fig. 2 and 3 for a rear view of the 32A1 DU.

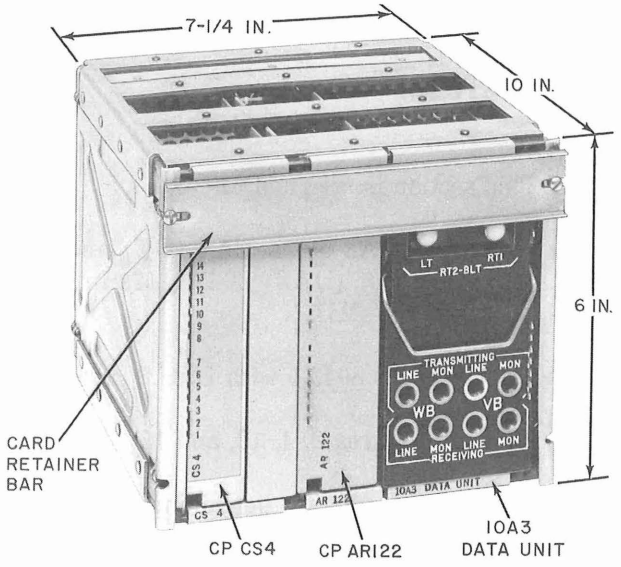


Fig. 1—32A1 Data Unit—Front View

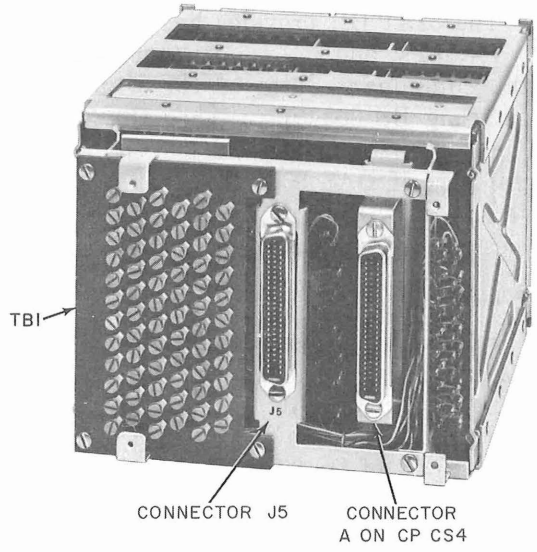


Fig. 2—32A1 Data Unit—Rear View

2.02 The dimensions of the 32A1 DU are 7.25 inches wide, 6 inches high, and 10 inches deep. The set weighs approximately 11 pounds.

2.03 When the 32A1 DU is equipped with a mounting plate and a 26A power supply, the 32A1 DU becomes DAS 806D1. When equipped with the proper 87-type brackets, DAS 806D1 can

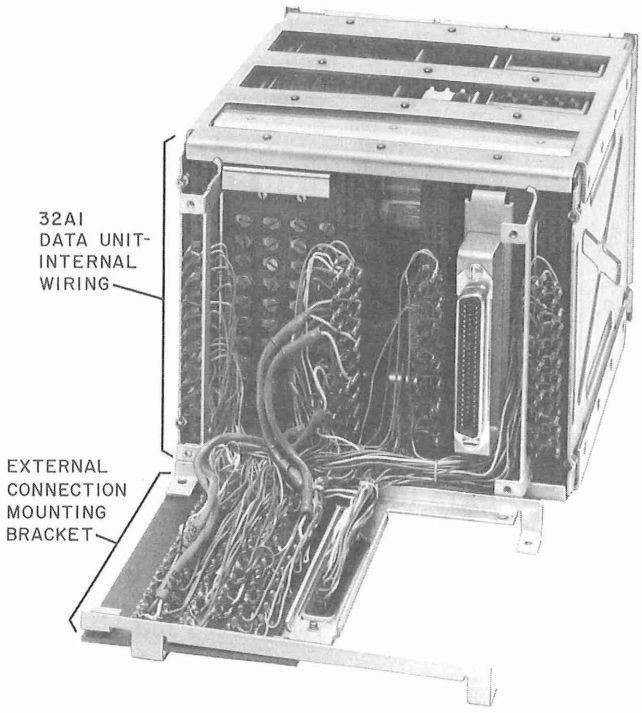


Fig. 3—32A1 Data Unit—Internal Wiring

be mounted in a KS-20018-type cabinet or on a 19-, 23-, or 25-inch relay rack.

3. FUNCTIONAL DESCRIPTION

GENERAL

3.01 The 32A1 DU (when used as part of DAS 806D1) provides line interfacing, test features, and interconnection arrangements for the component units of the wideband data stations using DS 303. The 32A1 DU provides line interfacing, test features, and interconnection arrangements for DS 306-type when used as part of the DS 306-type.

3.02 The 32A1 DU provides for operation with different wideband data sets. Certain basic features are provided as follows:

- Monitoring and terminating jack arrangements for test access to the associated 4-wire wideband and voiceband line facilities.

- Means for looping the data station transmit line circuits to the receive line circuits. This permits a check of performance through

the data station from the business machine on a local test loop-back basis.

- A remote test capability. This feature enables a test center to loop back both the wideband and voiceband facilities at the data station line interface so that transmission test may be made from the test center and also to loop back the wideband and voiceband data sets at the customer's interface so that overall data transmission tests may be made from the test center.

- Means for bypassing the line-looping features, when this feature is provided in the auxiliary equipment (DS 306 application).

- Means for interconnecting the several apparatus units of a wideband data station or wideband data set.

- The coordination channel control circuitry for use with DAS 804-type and voiceband data sets as required for the various station arrangements.

3.03 When the 32A1 DU is used as part of DS 306-type, the 32A1 DU receives power from the data transceiver. When the 32A1 DU is used as part of DAS 806D1, the 32A1 DU receives power from DAS 806D1. The DAS 806D1 is used in conjunction with DS 303-type data stations.

32A1 DATA UNIT

3.04 The wideband data station has several service applications, ie, private line, secure speech networks, switched service, etc. The 32A1 DU performs a similar function in each application. The wideband data stations are designed to provide high-speed wideband data service with a voice coordination circuit that may be used for speech transmission only or for transmission of speech and voiceband data as required. The relationship of the 32A1 DU to the remaining parts of the station is shown typically in Fig. 4.

3.05 The 32A1 DU consists of a 10A3 DU, a 2800-Hz detector (CP AR122), and a coordination channel unit (CP CS4). A functional description of these units is contained in 3.06 through 3.36.

A. 10A3 Data Unit

3.06 The 10A3 DU (Fig. 5), when used in the 32A1 DU, provides a means for looping both a 4-wire wideband line circuit and a 4-wire voiceband line circuit. Control circuitry and indicating circuitry related to these looping functions are provided by the data unit. The data unit also provides monitoring and terminating jack access to the line circuits. The above features are provided by the line circuit pack (AR512). In addition to the above features, the 10A3 DU provides a sequential relay circuit which includes control and indicating circuitry associated with the two remote test modes. This is provided by the sequential relay circuit CP CR2.

Monitoring and Terminating Jacks

3.07 Monitoring and terminating jacks are provided for test access to the associated 4-wire wideband and voiceband line facilities. Both transmit and receive pairs of the wideband and voiceband lines connect to the "normal" of the line jacks. When a line is so terminated, it is disconnected from all circuitry internal to the data auxiliary set. Monitoring or bridging jacks are provided on both transmit and receive pairs of the wideband and voiceband transmission paths. These jacks may also be used as equipment terminating jacks by inserting dummy plugs in the corresponding line terminating jack.

Local Test

3.08 Functionally, the local test permits the business machine to send data to itself through the data station. The local test condition can be initiated in any one of three ways: by operating the LT key on the 10A3 DU, by depressing the TEST button on the associated DAS 804A-type, or by the customer establishing an ON signal on the LT lead of the customer interface of the connecting wideband data set.

3.09 Regardless of how the local test condition is established, it is functionally the same. The local test circuitry consists of locking key LT, indicating lamp LT, and relays LTA, LTB, LTC, and LTD. The data auxiliary set is placed in the local test mode by operating relay LTA. This causes relay action which operates the remaining local test circuitry.

3.10 When operated, the LTA and LTB relays loop the wideband transmit data pair to the wideband receive pair in order that the connecting business machine equipment can send to itself. In addition to providing this loop-back function, these relays, when operated, also isolate the facility from the station equipment and terminate the wideband facility in 135 ohms.

3.11 The above discussion of local test is valid for the wideband line circuits; however, certain options change the physical looping of the local test. When option A is installed, relays LTA and LTB operate but do not loop the wideband transmit data pair to the wideband receive data pair inside the 10A3 DU. When option A and option ZG are installed, relays LTA and LTB control the operation of a looping relay in the auxiliary equipment via the L and G leads.

3.12 When operated, the LTD relay loops the voiceband transmit pair to the voiceband receive pair in order that the connecting business machine can send to itself. This feature is used only when a 4-wire voiceband data set is provided. In addition to providing this loop-back function, this relay, when operated, also isolates the facility from the station equipment and terminates the voiceband facility in 600 ohms. This relay is arranged with an option so it can be disabled when the voiceband circuit is 2-wire. Relay LTC provides supervisory functions.

3.13 The local test mode is indicated by a lighted LT lamp on the 10A3 DU. An indication of the local test status from the 32A1 DU is supplied to the connecting data set. This indication is provided over the LTC lead which delivers a ground when the 32A1 DU is not in the local test mode. This ground is removed when the data auxiliary set is in the local test mode.

Baseband Local Test

3.14 Certain DS 303-type wideband data stations operating at half-group speeds involve the use of DAS 809. The local test mode, as previously discussed, involves a loop-back of the entire data station. Provision is made for bypassing DAS 809 by performing a baseband local test. The baseband local test mode is established by initiating the local test mode in the usual manner and then momentarily depressing the nonlocking BLT key. The BLT key is located on the 10A3 DU. This action locks the station in the baseband local test mode. Momentary operation of the nonlocking BLT key applies +18 volts to the BLTK lead which connects to DS 303. This +18 volts is used in conjunction with the −18 volts on the BLTL lead to operate the BLT relay in DAS 809. Release of the local test mode drops the baseband local test mode since relay LTC releases and removes the −18 volts from the BLTL lead. The baseband local test mode is indicated by lighting of both the LT and RT1 lamps on the 10A3 DU.

Remote Test

3.15 The remote test circuitry in the 32A1 DU consists of the 2800-Hz detector (CP AR122), the sequential relay circuit (CP CR2—part of 10A3 DU), relays RT1A and RT1B, indicating lamps RT1 and LT, and the LRT key. When option B is provided, the wideband transmission path includes the remote and local looping contact configuration. When option A is provided, the wideband transmission path bypasses the looping configuration. In this case, the data unit provides a contact closure of relay RT1S to operate line-looping relays in the auxiliary line terminating equipment via the L and G leads.

3.16 The 2800-Hz test signal is detected by the 2800-Hz detector. (See 3.17 through 3.22.) This causes the 2800-Hz detector to apply +18 volts to the input leads of the sequential relay circuit. The sequential relay circuit is a sequential stepping circuit which is driven by an application of +18 volts to terminals 32 and 21 followed by the removal of the voltage. The circuit has three states which occur in the following sequence: the normal (or idle) state, first-operated state, and second-operated state. The first application and removal of +18 volts to the input leads of the sequential relay circuit cause the release of relay RTNS and the operation of relay RT1S. When operated, relay RT1S closes the operating path for line-looping relays RT1A and RT1B, thus completing the relay circuit to +18 V through either the Z option or the C3 lead when DAS 804A-type is provided. The 32A1 DU is now in the RT1 mode. Release of relay RTNS causes the RT1 lamp to light and remain lighted for the duration of the remote test sequence and also applies ground to the OOS lead. The grounded OOS lead puts an associated DAS 804-type in the data mode for the duration of the test sequence. This lead is also grounded during local test. Battery

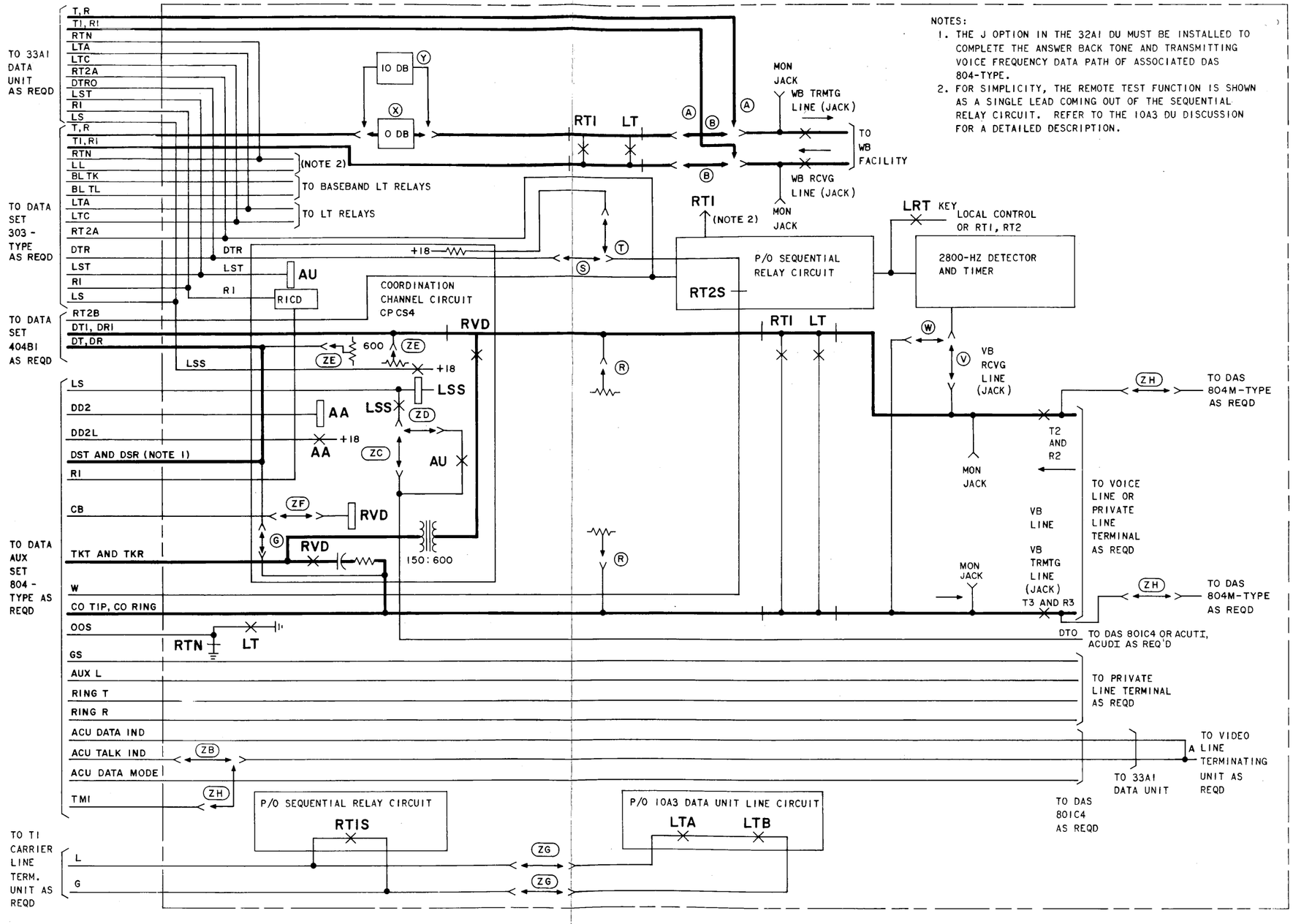
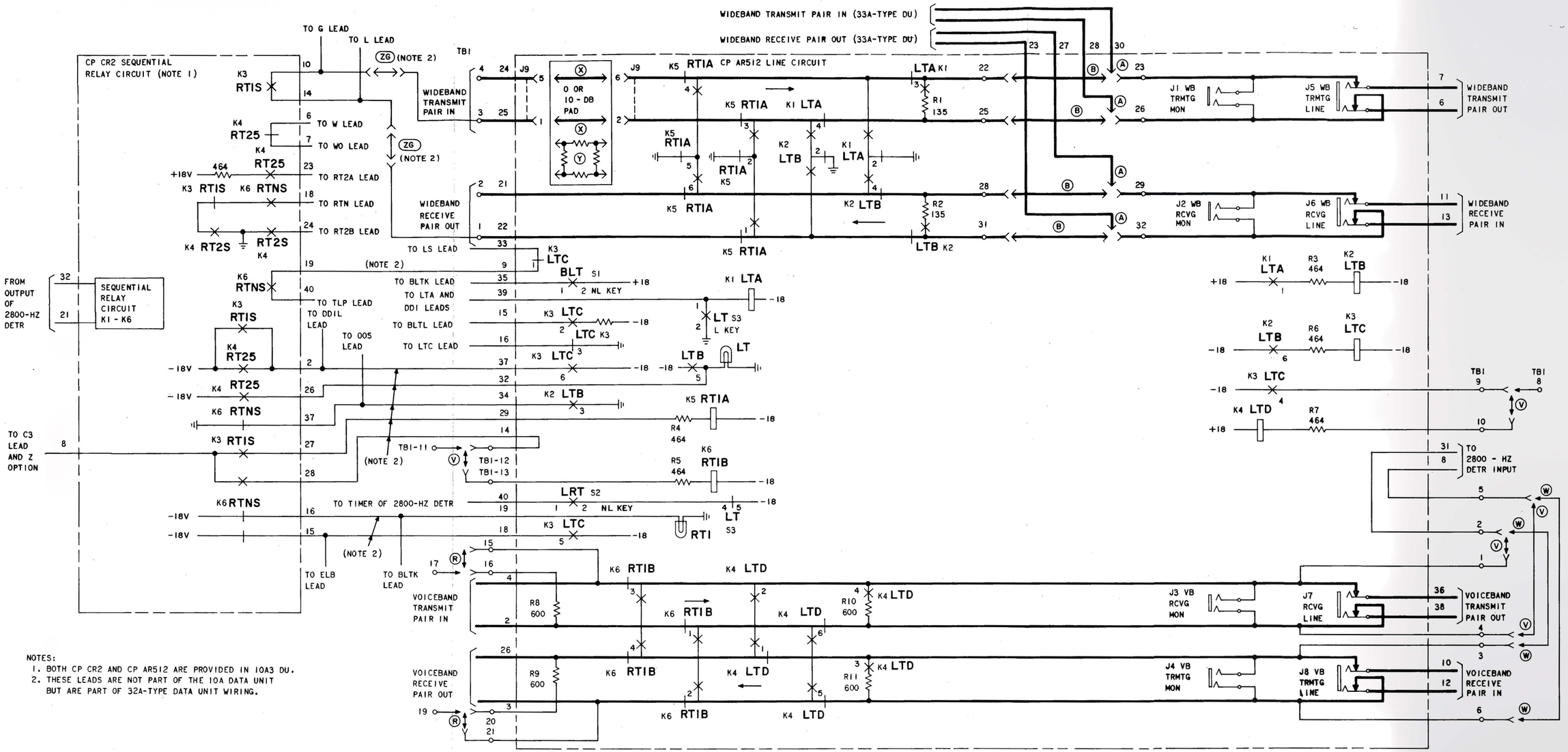


Fig. 4—32A1 Data Unit—Simplified Functional Diagram



NOTES:
1. BOTH CP CR2 AND CP AR512 ARE PROVIDED IN 10A3 DU.
2. THESE LEADS ARE NOT PART OF THE 10A DATA UNIT BUT ARE PART OF 32A-TYPE DATA UNIT WIRING.

Fig. 5—10A3 Data Unit—Functional Diagram

is applied to the DD1L lead through a make contact on relay RT1S to light the TEST lamp in DAS 804A-type. A second application of +18 volts to terminals 32 and 21 causes the sequential relay circuit to advance to its second state. Relay RTNS remains released. Relay RT1S releases and in turn releases relays RT1A and RT1B. Relay RT2S operates and remains operated until a third application and release of the test signal. The release of relays RT1A and RT1B restores the transmission path in the data auxiliary set to the normal condition. With operation of relay RT2S, the data auxiliary set is in the remote test 2 mode. Ground is still removed from the RTN lead and will not be reapplied until the release of relay RT2S at the end of the remote test sequence. Battery is applied to the DD1L lead through a make contact on operated relay RT2S to light the TEST lamp in DAS 804A-type. Battery is also supplied to the LT lamp through a make contact on operated RT2S. Since the RT1 lamp remains lighted throughout the remote test sequence, the combination of lighted lamps RT1 and LT is used to indicate the RT2 mode. The test condition established in the RT2 mode produces station loop-back at the data set side of customer interface. A third application of +18 volts to terminals 32 and 21 causes the sequential relay circuit to return to its normal nontest state. Relay RTNS operates, and relay RT2S releases. Ground is reapplied to the RTN lead and removed from the OOS lead. All lamp indications are extinguished, control leads RT2A and RT2B become inactive, and the connecting data sets are released from the loop-back condition. The 32A1 DU is now ready to begin the next remote test sequence upon receipt of the test signal. The remote test sequence can be interrupted and the station placed in the normal nontest state by interrupting the 117-volt ac 60-Hz supply voltage.

B. 2800-Hz Detector (CP AR122)

3.17 The 32A1 DU is equipped with a 2800-Hz test signal detector (Fig. 6). The application and release of the test signal is detected and provides a relay contact closure at the 2800-Hz detector timer output. The first application and release of the test signal operates the output (SR) relay which causes the +18 V input to be applied to the sequential relay circuit in the 10A3 DU establishing RT1 mode. The second application and release of the test signal causes the SR relay to operate the second time, and the +18 V input is again applied to the sequential relay circuit. This causes the sequential relay circuit to advance to its second state—RT2 mode. The third application and release of the 2800-Hz test signal cause the SR relay to operate and the +18 V signal to be applied to the sequential relay circuit. This causes the sequential relay circuit to return to its normal nontest state.

3.18 The 2800-Hz detector circuit is divided into four basic parts: amplifier limiter input stage, signal and guard detector, dc amplifier-slicer, and timer.

3.19 The amplifier-limiter input stage provides lightning protection and dc isolation. When the maximum usable input of −2.5 dBm is reached, distortion caused by overloading begins to interfere with the detection of the signal and provides a power-sensitive guard signal. The frequency response of the amplifier-limiter input stage increases to 1300 Hz and rolls off at higher frequencies. The decrease in low-frequency gain reduces the sensitivity to low-frequency noise and signals.

3.20 The signal and guard detector circuit contains two networks (Z1 and Z2) and associated circuitry. These networks, one parallel resonant and the other series resonant at 2800 Hz, are arranged so that, when the frequency of the input signal is 2800 Hz, the junction of a voltage divider is positive. This junction is negative when the input signal is not 2800 Hz.

3.21 The dc amplifier-slicer is controlled by the polarity of the voltage at the junction of voltage divider. When this junction becomes positive, the amplifier turns on and operates relay T.

3.22 A contact on relay T starts the operation of the timer. At the end of the nominal 5-second interval controlled by the timer, relay SR operates. Operation of the SR relay supplies +18 V to terminals 10 and 15 and interrupts the −18 V supplied to terminal 14. The +18 V controls the sequential relay circuit in the 10A3 DU. The interruption of −18 V is used to initiate certain timing periods in an associated DAS 804-type. If relay T is released before relay SR operates, the timer is reset and requires a full timing interval to recycle. This ensures against false operation of the 2800-Hz detector circuit. The timer circuit can also be operated without the presence of a 2800-Hz signal by supplying +18 V to terminal 7.

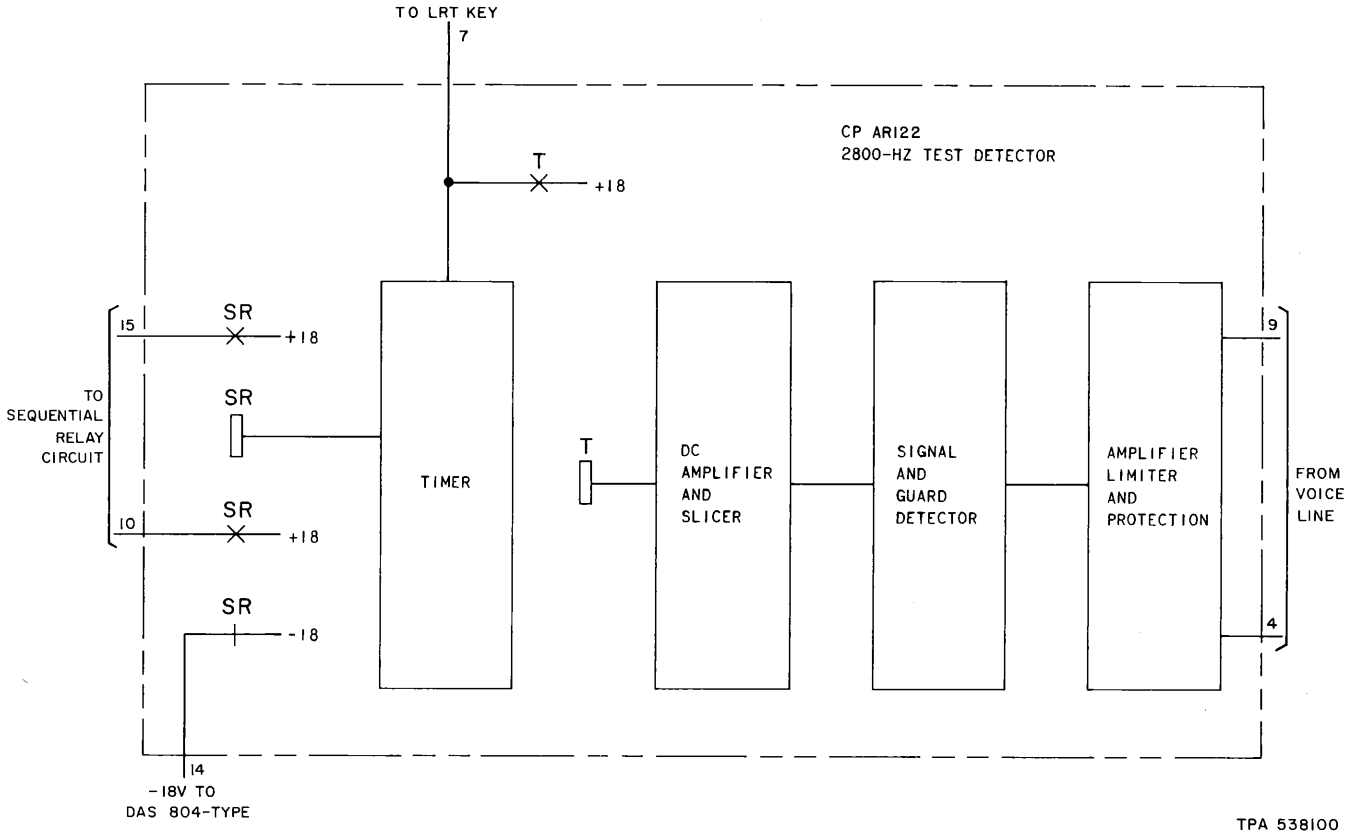


Fig. 6—2800-Hz Test Detector—Simplified Block Diagram

C. Coordination Channel Adapter Unit (CP CS4)

3.23 This circuit provides miscellaneous control functions, impedance matching, and switched sidetone coupling networks (Fig. 7). Also refer to Fig. 4.

3.24 The voice channel associated with a wideband data station may be used for voice or voice and low-speed data communication. The coordination channel unit (CP CS4) provides the circuitry related to this usage. When this service is provided, a DAS 804-type is provided to supply station control features and talking capability. When low-speed data capability is required, as in certain 303-type stations, an appropriate voiceband data set is added: DS 404B1 for 4-wire private line applications or DS 103F2 for 2-wire switched application.

3.25 The associated low-speed data set connects to the data unit through the A connector on CP CS4. When the connecting data set is a 4-wire set, leads DT and DR connect to the data set transmitter; leads DT1 and DR1 connect to the data set receiver. Lead RT2B is the control lead for operating the loop-back relays in the low-speed data set and is energized in the RT2 mode. When the connecting data set is a 2-wire set, leads DT and DR form the transmission path.

3.26 Relay RVD provides switching of the receive side of the coordination circuit from voice to data under control of a connecting DAS 804A5. This function is activated when option ZF is provided and is required when the coordination circuit is a 4-wire private line. When the coordination circuit is switched or is a 2-wire private line, option ZF is omitted and the RVD relay is disabled.

3.27 When the connecting DAS 804A5 is in the talk mode and option ZF is provided, the transmit voice path is over the CO TIP and CO RING leads from the DAS 804A5 to the corresponding T3 and R3 leads connecting to the associated

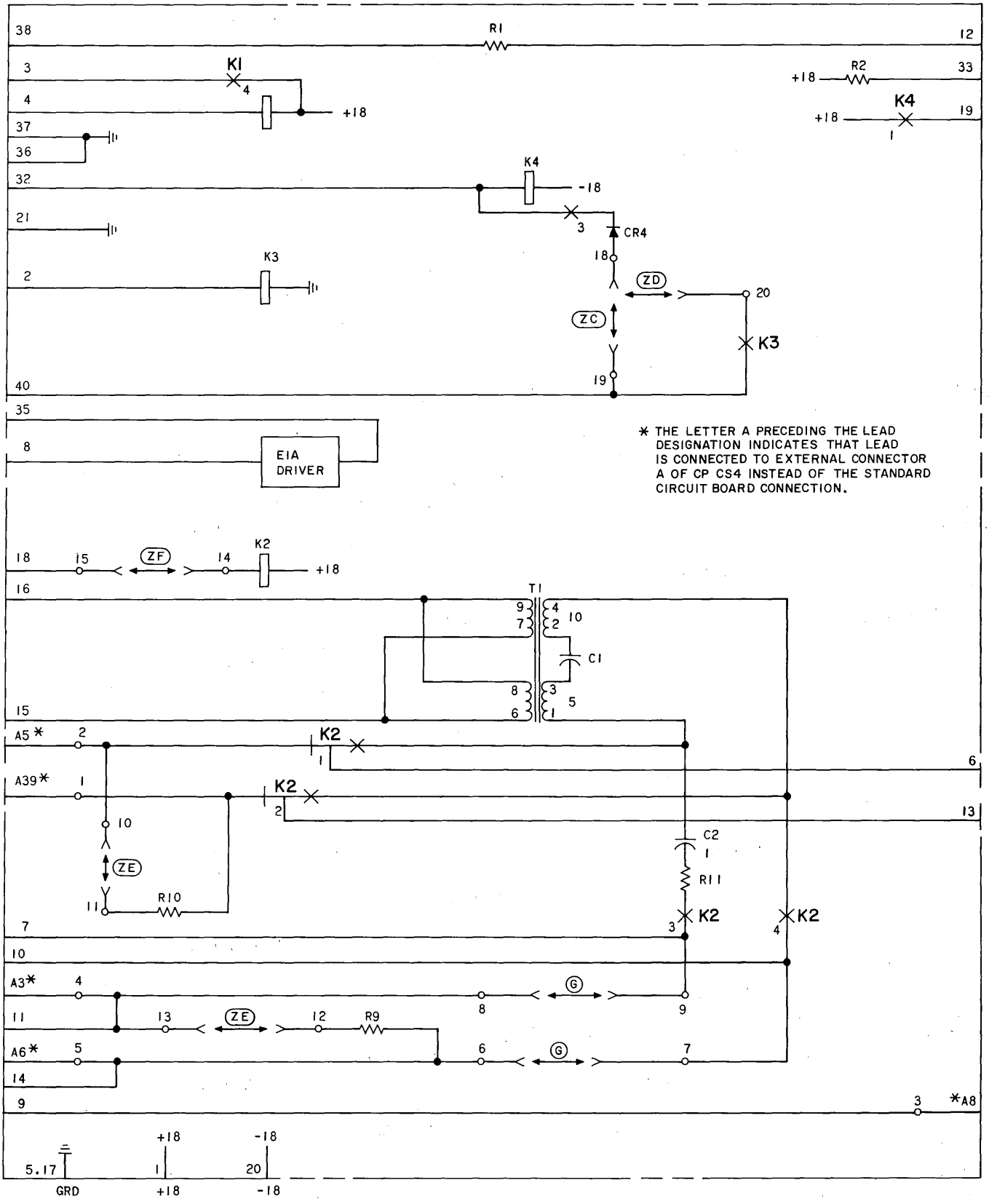


Fig. 7—Coordination Channel Adapter Unit CP CS4—Functional Schematic

private line terminal. Relay RVD is held operated over the CB lead by ground originating in DAS 804A5. The receive voice path is over the T2 and R2 leads from the associated private line terminal, over the T2 and R2 leads to transfer contacts on the operated RVD relay, and then through the impedance-matching transformer to the TKT and TKR leads. These leads go to the telephone receiver in a connecting DAS 804A5. A balanced voice sidetone path is provided through RC networks, make contacts of operated relay RVD, and leads T3 and R3 from circuit pack CP CS4 which bridge the transmitting pair CO TIP and CO RING.

3.28 When connecting DAS 804A5 is in the data mode, the transmit low-speed data path is from connecting DS 404B1 over the DT and DR leads, through circuit pack CP CS4 to the DST and DSR leads, through DAS 804A5 to the 32A1 DU over the CO TIP and CO RING leads, and then to the connecting private line terminal over the T3 and R3 leads. Relay RVD is released when DAS 804A5 is in the data mode since ground is removed from the CB lead. The receive path is over the T2 and R2 leads from the associated private line terminal, over the T2 and R2 leads to the transfer contacts of released relay RVD, and then to leads DT1 and DR1 which carry the received data to the receiver of DS 404B1. The sidetone coupling path is opened when relay RVD is released.

3.29 When it is desirable to provide an appearance of the 4-wire telephone line on voiceband data set connector A, option G should be provided and the RVD relay should be disabled by omitting option ZF.

3.30 When the connecting voiceband data set is 2-wire, the transmission path is over the DT and DR leads to the DST and DSR leads. Option ZF is omitted and relay RVD is disabled, thereby eliminating the bridging effect of the sidetone coupling path.

3.31 Relay AA is operated by ground applied over the DD2 lead when the AUTO ANS pushbutton is depressed in a connecting DAS 804A-type provided with the automatic answer option. When operated, relay AA applies +18 volts to the DD2L lead to light the AUTO ANS button in DAS 804A-type.

3.32 A current-limiting resistor is provided in the DTR/DTRO lead to the connecting data set or data unit. The data terminal ready (DTR) signal, when provided by the customer terminal, passes through the connecting data set, enters the 32A1 DU over the DTR lead, and is passed to connecting DAS 804-type through option S and leads WO and W. When the DTR function is permanently wired, the signal is provided through a resistor connected to +18 volts and wiring option T.

3.33 An EIA cable driver circuit is provided in the RI lead to modify a ring indicator (RI) signal from connecting DAS 804-type. The DAS 804-type closes the RI lead to ground when ringing is present. This ground originates in the 32A1 DU over the COM lead. The RI lead from DAS 804 is open at all other times. The signal delivered to a connecting data set or data unit from the EIA driver is positive when ringing is present and negative at all other times.

3.34 A connecting DAS 804-type provides a line status (LS) indicator to the 32A1 DU over the LS lead. This indicator is required in certain wideband station arrangements and may be utilized in different ways. In 303-type wideband station arrangements for nonsynchronous wideband service which include a voiceband data set, either both data sets are activated or the station is in the talk mode. In DS 303-type wideband station arrangements for synchronous service with no voiceband data provision, simultaneous transmission of wideband data and talking can occur after the station has initially entered the data mode and returned to the talk mode. Those stations which are arranged for alternate use provide both types of operation under control of the alternate-use signal. These various modes of operation are achieved by modification of the line status (LS) signal to the connecting data set over the LS lead. In any event, the LS indication from DAS 804-type is a ground for the ON state and an open circuit for the OFF state. As delivered to the data set over the LS lead, the ON state is +18 volts and the OFF state is an open circuit. Relays LSS and AU, together with their associated options, perform the translation in the LS signal from ground to +18 volts and control the application to the connecting data set. Relay LSS operates when a ground signal is on the LS lead and thus will follow the LS signal from DAS 804-type when neither the ZC nor ZD option is provided. When option ZC is provided and ground is present on the TI lead of CP CS4 (combination of talk mode and data

mode indications from DAS 804), relay LSS will lock up to this ground after initially operating from the LS ground. This function maintains the LS signal to the connecting data set when the associated DAS 804 is returned to the talk mode. When option ZD is provided, the lockup to ground on the TI lead will occur only when the lockup path is completed by operated relay AU. Relay AU is operated by +18 volts on the LST lead from a connecting DS 303-type. Since the LST lead is under control of the alternate-use signal to DS 303, the condition for lockup of the LSS relay is under control of the data terminal.

3.35 Supervisory functions involved in administering the voice circuit are passed to the connecting private line terminal from connecting DAS 804A5. These are described in Table A and 3.27.

TABLE A

LEAD DESIGNATION	MEANING
AUX L	RING lamp activator
GS	RING pushbutton closure to ground
RING T, RING R	Local ringing signal path
AUX	Ground bus

3.36 The CO TIP, ACU DATA MODE, GRD, ACU TALK IND, and ACU DATA IND leads are made available for connection to an external automatic calling unit. In addition, the ACU TALK IND and ACU DATA IND leads appear for use when the 32A1 DU is part of DS 306-type. When the ACU TALK IND function is required, option ZB must be provided when DAS 804A-type is used, and option ZH must be provided when DAS 804M-type is used.

D. Operation as Part of Data Set 306

3.37 When operating as part of DS 306, the 32A1 DU becomes an integral part of DS 306. The 32A1 DU derives its power from DS 306. The A option is installed, thereby routing the wideband transmission path around the remote and local test features. The remote and local test features operate normally; however, the actual line-looping takes place in the line terminating unit (Fig. 8).

E. Operation as Part of Data Auxiliary Set 806D1

3.38 A 26A power unit is added to the 32A1 DU to comprise a DAS 806D1. When operating as part of DAS 806D1, the B option is installed. With the B option installed, the remote and local test looping action takes place within the 10A3 DU part of the 32A1 DU (Fig. 9).

32A2 DATA UNIT

3.39 ▶The 32A2 DU, intended for use in DAS 806D2 as a replacement for DAS 806B5, was not manufactured and is now rated MD. The DAS 806B5 is rated A&M.◀

4. OPERATION

4.01 Attendant operation is confined to the controls on the customer business machine; however, there are controls located on the 10A3 DU associated with testing.

4.02 Following are descriptions of the operation of the controls and indicators on the front of the 10A3 DU:

- ***LT key***—Turning the locking LT key to the horizontal position causes relay action which places the data station in the local test mode and disables the local control of the remote test mode.

- ***BLT key***—A nonlocking key that, when depressed, causes relay action that places the connecting DAS 809 in the baseband local test mode, provided the station is already in the local test mode. The BLT circuits are released when the data station is removed from the local test mode. The

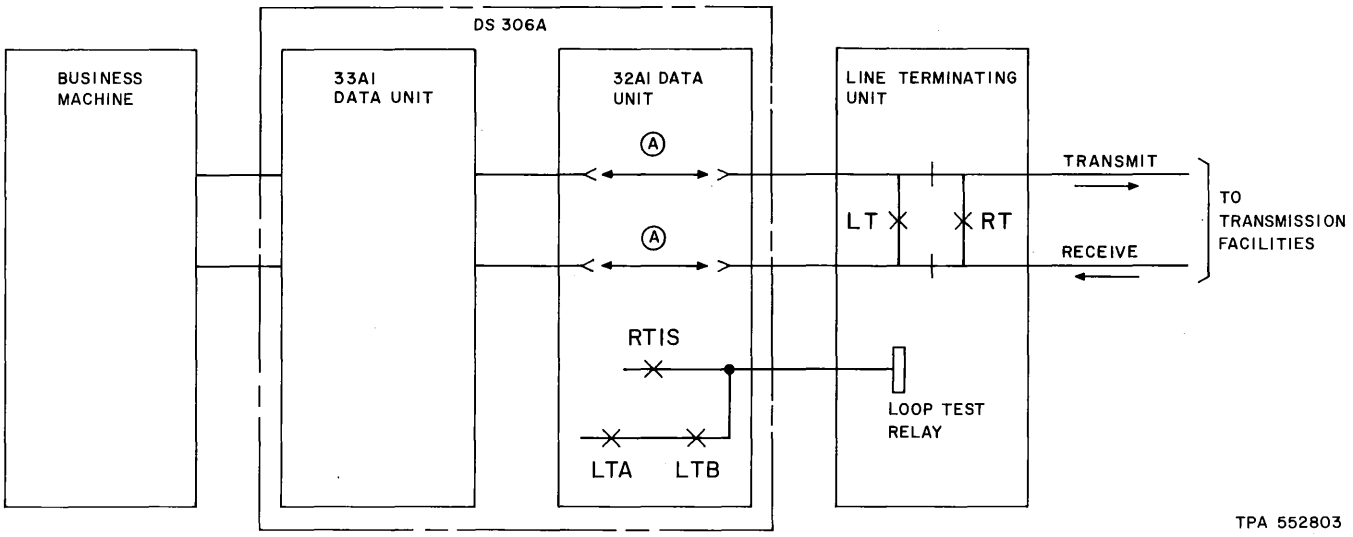


Fig. 8—Operation With DS 306—Simplified Block Diagram

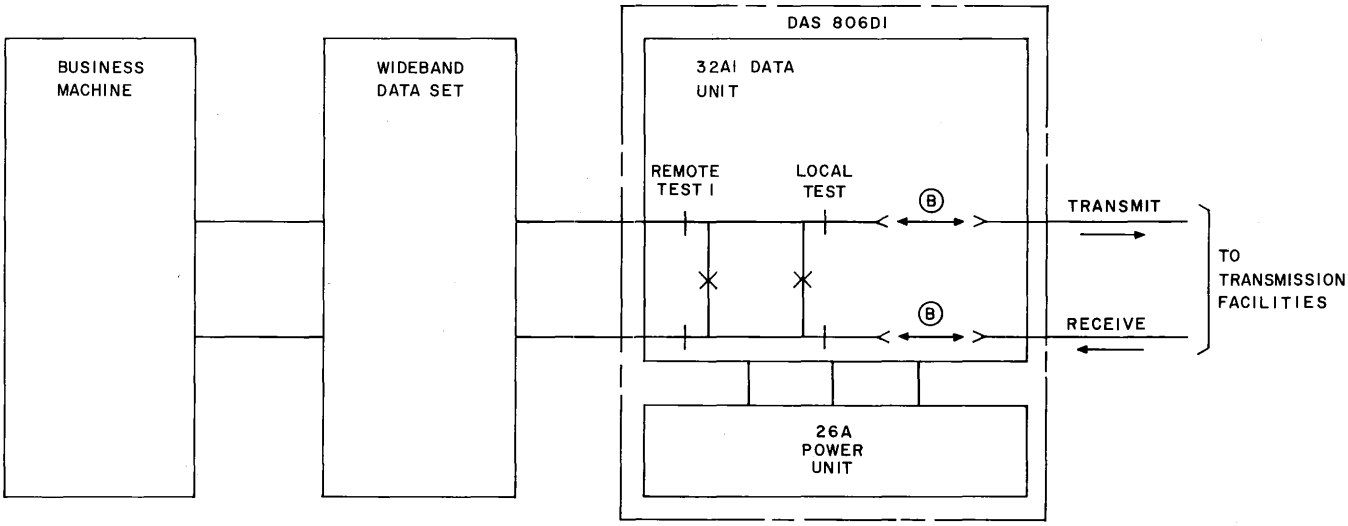


Fig. 9—Operation With DAS 806D1—Simplified Block Diagram

BLT key performs no useful function unless there is a connecting DAS 809.

- ***LRT key***—A nonlocking key that, when depressed and held for approximately 7 seconds, causes the remote test circuits to be advanced to the next step. This provides a means for manually stepping through the remote test sequence.

- ***LT lamp***—The LT lamp lights and remains lighted during the local test mode. The LT lamp also lights with the RT1 lamp to form the remote test 2 indication.

- ***RT1 lamp***—The RT1 lamp lights and remains lighted during the remote test mode.

Note: Both the LT lamp and the RT1 lamp are lighted during either the remote test 2 or the baseband local test.

5. OPTIONS

5.01 The following options can be provided as required for specific installations of the 32A1 DU:

- ***A Option***—Provides a wideband transmission path through the 32A1 DU in which the remote test and local test looping configuration is bypassed. Option A is used when the 32A1 DU is part of DS 306-type and also in cases where the loop-back functions are performed in auxiliary equipment. The A option requires the following strapping on TB1 of the 10A3 DU: 23-24, 26-27, 29-30, 32-33.

- ***B Option***—Provides a wideband transmission path through the 32A1 DU which includes the remote test and local test looping configurations. Option B is usually used when the 32A1 DU is part of DAS 806D1. The B option requires the following strapping on TB1 of the 10A3 DU: 22-23, 25-26, 28-29, 31-32.

Note: Options A and B are mutually exclusive.

- ***G Option***—Connects transmitting side of 4-wire voice circuit to voiceband data connector (receive side of 4-wire voice circuit normally appears at voiceband data set connector). This option is used when a voiceband data set and DAS 804A-type are not provided and it is desired to provide access to the 4-wire voice line through the voiceband connector. When connecting to the voice line in this manner, the LT and RT1 looping paths of the 32A1 DU are included in the 4-wire voice transmission path. Not factory-furnished. Strap terminals 6-7, 8-9 on CP CS4.

- ***J Option***—Completes the answer-back tone and voice-frequency data path of an associated DAS 804A-type. The option completes these paths by connecting the DAS 804A-type mounting cord leads Q to D1, D2 to ACU DATA MODE, and D1 to L2. Factory-furnished. Strap TB1, 30-31, 31-32, 13-14 on the 32A1 DU.

- ***R Option***—Provides 600-ohm termination for the voiceband line when the line is to be used only for transmission or remote test control signals. Not factory-furnished. Strapping is on TB1 of the 10A3 DU, 15-16, 20-21.

- ***S Option***—Used when the DTR signal is to be provided from the customer data terminal. It must be used if the station has an automatic answer feature. Factory-furnished. Strap TB1, 28-29 on the 32A1 DU.

- ***T Option***—Provides a permanent DTR signal. Strap TB1, 27-28 on the 32A1 DU.

Note: Options S and T are mutually exclusive.

- ***V Option***—Used when the voice-frequency circuit is 4-wire. Factory-furnished. Strapping is on TB1 of 10A3 DU, 1-2, 4-5, 9-10, 12-13, and TB1 of 32A1 DU, 31-32.

- ***W Option***—Is provided for use when the voice-frequency circuit is 2-wire. Not factory-furnished. Strapping is on 10A3 DU, TB1 2-3, 5-6.

Note: Options V and W are mutually exclusive.

- ***X Option***—Provides a 0-dB pad in the wideband transmitting line. It must be used when the 32A1 DU is used with DS 303-type and DS 306A. Factory-furnished in the 32A1 DU. Option is a plug-in pad in the 10A3 DU.

- ***Y Option***—Provides a 10-dB pad in the wideband transmitting line. This option is not used with DS 303-type or DS 306A. It is used in the 10A3 DU when that unit is used as part of DAS 806B5. Option is a plug-in pad in the 10A3 DU.

Note: Options X and Y are mutually exclusive. Pad is reversed in connector to obtain the other value.

- ***Z Option***—Provided in absence of DAS 804A-type. Supplies power for wideband and voiceband RT1 relays in DS 303-type stations and voiceband RT1 relay in DS 306A-type applications. Not factory furnished. Strap TB1, 19-20 on the 32A1 DU.

- ***ZA Option***—Provides the operating path for the WB CHAN lamp in an associated DAS 804A-type. This option is used when the 32A1 DU is part of DAS 806D1. Strap TB1, 45-46 on the 32A1 DU.

- ***ZB Option***—Use when DAS 804A-type provides the path for the ACU TALK IND function which provides off-hook indication for talk mode. Options ZB and ZH are mutually exclusive. The ACU TALK IND function from DAS 804-type appears on J5-4 when the DAS is 804A-type and on J5-43 when the DAS is 804M-type. Not factory-furnished. Strap TB1, 52-53 on the 32A1 DU.

- ***ZC and ZD Options***—Provides the capability of simultaneous talking and transmission of wideband data when the 32A1 DU is used as part of DS 306A or as part of DAS 806D1. Neither the ZC nor ZD option should be provided when this capability is not required as is the case when a voiceband data set is provided on the coordination channel. Option ZC should be used when the simultaneous talking and wideband data capability is required as a permanent arrangement. Option ZD should be used when control of this capability is from the alternate-use (ALT) signal to an associated data set, such as 303-type. Options ZC and ZD are mutually exclusive. For option ZC, strap terminals 18-19 on CP CS4. For option ZD, strap terminals 18-20 on CP CS4.

- ***ZE Option***—Provides terminations for the voice line when a voiceband data set is not provided to terminate an associated DAS 804-type operated in the data mode. Strap terminals 10-11, 12-13 on CP CS4.

- ***ZF Option***—Connects control path to RVD relay to provide switching of the receive pair of a 4-wire full-period point-to-point voice coordination line between the telephone receiver of an associated DAS 804A-type and an associated DS 404B1 under the control of the operating mode of the associated DAS 804A-type. This option is required in 4-wire full-period point-to-point service using DS 303-type. In this case, the 32A1 DU is part of DAS 806D1. Not factory-furnished. Strap terminals 14-15 on CP CS4.

- ***ZG Option***—Provides a contact closure to operate an external looping relay when the data unit is placed in the local test mode. Option ZG is used together with option A when the 32A1 DU is part of DS 306-type. Strap TB1, 1-57, 3-58 on the 32A1 DU.

- ***ZH Option***—Certain station arrangements involving DAS 806D1, DS 303-type, and DAS 804M-type require that the transmission path of DAS 804M-type be connected between the 4-wire voice line and DAS 806D1. Installation of option ZH permits the equipment side of DAS 804M-type (DST, DSR, DST1, DSR1) to be connected to the line side of DAS 806D1 by plugging into the J5 connector of the 32A1 DU. In this case, the 4-wire voice telephone line is connected to DAS 804M-type rather than to DAS 806D1. This option also completes the ACU TALK IND function from DAS 804M-type which appears on J5-43 as the TM1 lead. Not factory-furnished. Strap TB1, 21-59, 22-60, 23-61, 24-62, and 52-54 on the 32A1 DU.

6. REFERENCES

6.01 The CDs and SDs for the apparatus and data units associated with the 32A1 DU are as follows:

- CD- and SD-1D218-01—32A-Type Data Unit
- CD- and SD-1D196-01—33A-Type Data Unit
- CD- and SD-1D217-01—Data Auxiliary Set 806D-Type
- CD- and SD-1D219-01—10A3 Data Unit
- CD-and SD-1D187-01—Data Set 306A-Type

6.02 Bell System Practices covering the various equipment associated with the 32A1 DU are given below:

- ◗Wideband Data Station Using Data Set 306, Point-to-Point, Limited Distance, Description and Operation (593-801-100)◖
- Wideband Data Station Using Data Set 303, Four-Wire Point-to-Point Private Line (Commercial Service), Description and Operation (593-800-100)
- Wideband Data Station Using Data Set 303-Type, Two-Wire Switched Service (Commercial Service), Description and Operation (593-800-110)
- Data Auxiliary Set 809B1, Identification (598-034-100)
- Data Set 404B1, Identification (594-024-100)
- 10A-Type Data Unit, Identification (590-100-106)
- ◗Data Auxiliary Set 806D-Type, Identification (598-077-100)◖
- ◗Wideband Data Station Using Data Set 303-Type, Four-Wire Point-to-Point, 50-KB Government Secure Voice Service, Description and Operation (593-800-101).◖