
**CONTROL DATA®
FIELD TEST UNIT
TB304**

**GENERAL DESCRIPTION
OPERATION
THEORY OF OPERATION
MAINTENANCE
DIAGRAMS
WIRE LISTS
PARTS DATA**

| REVISION RECORD | |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REVISION | DESCRIPTION |
| 01 (6-1-76) | Preliminary Release |
| A (9-15-76) | Manual Released. Includes ECO's 48212, 48217, 48225, 48238. |
| B (11-29-76) | Add ECO PE48224 for 50-pin I/O cables, make miscellaneous editorial corrections as indicated by "B" REV column of List of Effective Pages (page iii). |
| C (4-15-77) | Include models B and C, each with MMD capability. Provide ruggedized packaging. ECOs incorporated: PE48435, PE48474, PE48476, PE54002, PE50059, PE54009. This edition obsoletes all previous editions. |
| D (6-2-77) | Incorporate ECOs PE54015, 54018, 54023, 54029. Add part numbers for FTU models. Add clarification to certain operating/maintenance procedures. Make miscellaneous editorial changes, including consistency in nomenclature on logic diagrams. |
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LIST OF EFFECTIVE PAGES

Sheet 1 of 2

New features, as well as changes, deletions, and additions to information in this manual are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

| PAGE | REV |
|---------|-----|
| Cover | - |
| Blank | - |
| Title P | - |
| ii | C |
| iii | D |
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| 5-42 | C |
| 5-43 | C |
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| PAGE | REV |
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| 6-36 | D |
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LIST OF EFFECTIVE PAGES

Sheet 2 of 2

New features, as well as changes, deletions, and additions to information in this manual are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

| PAGE | REV | PAGE | REV | PAGE | REV | PAGE | REV |
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| 6-39 | D | | - | | | | |
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PREFACE

This manual has been prepared for customer engineers and other technical personnel who will be using the TB304 Field Test Unit (FTU) to assist in troubleshooting the Storage Module Drive (SMD) and the Mini-Module Drive (MMD). The FTU is available in three versions:

- TB304A - Exercise/test SMDs only, plus head alignment capability.
- TB304B - Exercise/test both SMDs and MMDs, plus head alignment capability for SMDs.
- TB304C - Exercise/test both SMDs and MMDs; no head alignment capability.

All B and C versions of the TB304, and all A versions with serial numbers 201 and above, are ruggedized to minimize damage during transportation and handling.

Personnel using this manual should already be familiar with the computer system, drive controller and drive logic, as well as system programming techniques for executing I/O operations, including the proper sequencing of I/O commands and signals between the drive and its controller.

The manual is divided into seven sections as follows:

- Section 1 - General Description. Contains the physical description and functional specifications for the FTU.

- Section 2 - Operation. Provides installation information and procedures for operating the FTU in all modes, as well as steps to take when error lights appear on the FTU control panel.

- Section 3 - Theory of Operation. Makes extensive use of flowcharts to show the FTU logic sequencing during the various operating modes.

- Section 4 - Maintenance. Contains procedures for adjusting the ± 5 V dc supplies and describes how to use sections 2, 3, and 5 to troubleshoot the FTU.

- Section 5 - Diagrams. Contains logic diagrams, schematic diagrams of the power supplies and "locator" drawings showing the physical lay-out of the parts in each electrical assembly.

- Section 6 - Wire List. Shows point-to-point wiring of the ICs on the logic board.

- Section 7 - Parts Data. Provides an exploded view of the TB304 and a breakdown of field replaceable parts.

CONTENTS

| | | | |
|--------------------------------------|------|---------------------------------------------------|-------------|
| 1. GENERAL DESCRIPTION | | Procedure 6: Check Data-Error Logic | 2-14 |
| Introduction | 1-1 | Procedure 7: Trouble Analysis | 2-15 |
| Specifications | 1-1 | Procedure 8: Using the Head Alignment Card | 2-15 |
| Functional Description | 1-1 | | |
| Access Modes | 1-1 | | |
| Direct Seek | 1-1 | | |
| Continuous Seek | 1-1 | | |
| Sequential Forward Seek | 1-1 | | |
| Sequential Reverse Seek | 1-1 | | |
| Random Seek | 1-1 | | |
| Read/Write Modes | 1-1 | | |
| Write Format | 1-1 | | |
| Write | 1-2 | | |
| Read | 1-2 | | |
| Write Then Read | 1-2 | | |
| 2. OPERATION | | 3. THEORY OF OPERATION | |
| Introduction | 2-1 | Introduction | 3-1 |
| Installation | 2-1 | I/O Lines | 3-1 |
| Operating Voltage | 2-1 | Salient Logic Elements | 3-5 |
| I/O Cables | 2-1 | Access (Seek) Modes | 3-8 |
| Head Alignment Cable | 2-1 | General | 3-8 |
| Controls and Indicators | 2-4 | Sequential Reverse (Seq Rev) Seek | 3-9 |
| Operation | 2-11 | Sequential Forward (Seq Fwd) Seek | 3-12 |
| General | 2-11 | Continuous (Cont) Seek | 3-14 |
| Preliminary Set-up | 2-11 | Direct Seek | 3-17 |
| Operating Procedures | 2-12 | Random (Rand) Seek | 3-19 |
| Procedure 1: Continuous Seek, No R/W | 2-12 | Read/Write Operations | 3-21 |
| Procedure 2: Random Seek, No R/W | 2-12 | Write Format Sequence | 3-21 |
| Procedure 3: Write Format | 2-13 | Read Sequence | 3-29 |
| Procedure 4: Read | 2-13 | Write Sequence | 3-34 |
| Procedure 5: Write Flag | 2-13 | Offset Mode/Delayed On Cylinder | 3-41 |
| | | FTU Error Logic | 3-43 |
| | | Address Error/Data Error Logic | 3-43 |
| | | Address Errors | 3-43 |
| | | Address Mark Error | 3-43 |
| | | Sync Bit Error | 3-43 |
| | | Address Word Error | 3-43 |
| | | Data Errors | 3-43 |
| | | Read Clock Error | 3-43 |
| | | Data Word Error | 3-43 |
| | | Servo Clock Error Logic | 3-43 |
| | | Sector Mark Error Logic | 3-44 |

| | | | |
|----------------------------------------------------------------|------|--------------------------------------------------|------|
| Normal Sequence | 3-44 | Word Cntr, End of Adrs Fld, R/W Reset Control | 5-15 |
| Abnormal Sequence | 3-44 | Word Mux | 5-16 |
| Unit Select/Release Logic | 3-44 | Pattern Register | 5-17 |
| Fixed-Head Operations | 3-45 | Read Data Compare | 5-18 |
| Head Alignment Card (HFSV) | 3-45 | Servo Clk, Adrs, Data Error Detection | 5-19 |
| 4. MAINTENANCE | | Sector Counting and Error Detection | 5-20 |
| Power Supply Voltage Checks | 4-1 | Character Cntr, Servo Clk, FTU Wrt Clk | 5-21 |
| Overvoltage Adjustment Procedure | 4-1 | Display Mux | 5-22 |
| Voltage Adjustment Procedure | 4-1 | Bus Out Mux | 5-23 |
| Troubleshooting the FTU Logic | 4-2 | Receivers I | 5-24 |
| General | 4-2 | Receivers II | 5-25 |
| Using the Testpoints | 4-2 | Transmitters I | 5-26 |
| Cylinder Select | 4-2 | Transmitters II | 5-27 |
| Head Select | 4-2 | Logic Board IC Placement | 5-28 |
| Address Mark | 4-2 | Logic Brd to Control Panel Cabling | 5-29 |
| Write Clock/Data | 4-3 | Brd to Panel Enabling, JC31 to J10, 11, 12 | 5-30 |
| Read Clock/Data | 4-3 | Brd to Panel Cabling, JD31 to J7,8,9 | 5-31 |
| Read Gate/Write Gate | 4-3 | Brd to Panel Cabling, JE31 to J4,5,6 | 5-32 |
| 5. DIAGRAMS | | Brd to Panel Cabling, JF31 to J1,2,3 | 5-33 |
| Key to Logic -- Symbology and Logic Interconnections | 5-1 | Control Panel | 5-34 |
| Key to Logic -- Flat-cable and IC Connector Pin Arrangement | 5-2 | Control Panel Indicators (LEDs) | 5-35 |
| TB304 B/C DIAGRAMS | | Control Panel Switches I | 5-36 |
| Logic Board | 5-3 | Control Panel Switches II | 5-37 |
| Start Control, RTZ | 5-4 | Control Panel Switches III | 5-38 |
| Access Control, Index Detection | 5-5 | Control Panel Test Points | 5-39 |
| Access Timing, Increment Cyl Adrs Reg | 5-6 | I/O Cabling | 5-40 |
| Cylinder Address Register | 5-7 | A-Cable, Connector J3 | 5-41 |
| Cylinder Address Mux | 5-8 | B-Cable, Connector J2 | 5-42 |
| Head Address Register | 5-9 | I/O Bypass Cable | 5-43 |
| Offset Control, On Cyl Detection | 5-10 | Power Supply Layout | 5-44 |
| Rd/Wrt Operation Start Control | 5-11 | Power Supply; Wiring Diagram | 5-45 |
| Rd/Wrt Format, Control I | 5-12 | Schematic Diagrams; ± 5 V Power Supplies | 5-46 |
| Rd/Wrt Format, Control II | 5-13 | Head Alignment Card (HFSV), Sheet 1 | 5-47 |
| Bit Cntr, Wrt Sync/Found Sync, Addr Mk Logic | 5-14 | | |

| | | | |
|-----------------------------------------------|------|-------------------------------------------|------|
| TB304 A DIAGRAMS | | | |
| Logic Board | 5-51 | Bus Out Mux | 5-71 |
| Start Control, RTZ | 5-52 | Receivers I | 5-72 |
| Access Control, Index Detection | 5-53 | Receivers II | 5-73 |
| Access Timing, Increment Cyl Adrs Reg | 5-54 | Transmitters I | 5-74 |
| Cylinder Address Register | 5-55 | Transmitters II | 5-75 |
| Cylinder Address Mux | 5-56 | Logic Board IC Placement | 5-76 |
| Head Address Register | 5-57 | Logic Brd to Control Panel Cabling | 5-77 |
| Offset Control, On Cyl Detection | 5-58 | Brd to Panel Cabling, JC31 to J10, 11, 12 | 5-78 |
| Rd/Wrt Operation Start Control | 5-59 | Brd to Panel Cabling, JD31 to J7,8,9 | 5-79 |
| Rd/Wrt Format, Control I | 5-60 | Brd to Panel Cabling, JE31 to J4,5,6 | 5-80 |
| Rd/Wrt Format, Controll II | 5-61 | Brd to Panel Cabling, JF31 to J1,2,3 | 5-81 |
| Bit Cntr, Wrt Sync/Found Sync, Addr MK Logic | 5-62 | Control Panel | 5-82 |
| Word Cntr, End of Adrs Fld, R/W Reset Control | 5-63 | Control Panel Indicators (LEDs) | 5-83 |
| Word Mux | 5-64 | Control Panel Switches I | 5-84 |
| Pattern Register | 5-65 | Control Panel Switches II | 5-85 |
| Read Data Compare | 5-66 | Control Panel Switches III | 5-86 |
| Servo Clk, Adrs, Data Error Detection | 5-67 | Control Panel Test Points | 5-87 |
| Sector Counting and Error Detection | 5-68 | I/O Cabling | 5-88 |
| Character Cntr, Servo Clk, FTU Wrt Clk | 5-69 | A-Cable, Connector J3 | 5-89 |
| Display Mux | 5-70 | B-Cable, Connector J2 | 5-90 |
| | | I/O Bypass Cable | 5-91 |

| | | | |
|---------------------------------------|-----|-------------------------------------|------|
| 6. WIRE LIST | | Logic Board Wire Wrap List, TB304 A | 6-37 |
| Introduction | 6-1 | 7. PARTS DATA | |
| Logic Board Wire Wrap List, TB304 B/C | 6-3 | Introduction | 7-1 |

FIGURES

| | | | | | |
|-----|------------------------------------------|------|------|----------------------------------------------------|------|
| 2-1 | TB304 and Associated Hardware | 2-2 | 3-8 | Write Format Track Pattern | 3-23 |
| 2-2 | TB304 Control Panel | 2-5 | 3-9 | Write Format Flowchart | 3-24 |
| 2-3 | Track Format | 2-14 | 3-10 | Read Track Pattern | 3-30 |
| | | | 3-11 | Read Flowchart | 3-31 |
| | | | 3-12 | Write Track Pattern | 3-35 |
| 2-4 | Head Alignment Card | 2-20 | 3-13 | Write Flowchart | 3-36 |
| 3-1 | TB304 Block Diagram | 3-4 | 3-14 | Offset Mode/Pseudo ON CYLINDER Signal Flowchart | 3-42 |
| 3-2 | Sequential Reverse Seek Flow- chart | 3-10 | 7-1 | TB304 Final Assembly, Standard Package | 7-2 |
| 3-3 | Sequential Forward Seek Flow- chart | 3-13 | 7-2 | Control Panel, Standard Package | 7-2 |
| 3-4 | Continuous (Alternate) Seek Flowchart | 3-15 | 7-3 | TB304 Final Assembly, Ruggedized Package | 7-3 |
| 3-5 | Direct Seek Flowchart | 3-18 | 7-4 | Control Panel, Ruggedized Package | 7-8 |
| 3-6 | Random Seek Flowchart | 3-20 | 7-5 | Component Assembly, 5VKN | 7-10 |
| 3-7 | Track Format and Basic R/W Timing | 3-22 | | | |

TABLES

| | | | | | |
|-----|-----------------------------------------|------|-----|--------------------------------------------|------|
| 1-1 | TB304 Specifications | 1-2 | 2-4 | Trouble Analysis (Decision Logic Table) | 2-17 |
| 2-1 | Connecting I/O Bypass Cable to Drive | 2-1 | 3-1 | I/O Lines | 3-1 |
| 2-2 | Head Alignment | 2-4 | 3-2 | Salient Logic Elements | 3-5 |
| 2-3 | Setting Sector Switches | 2-11 | 3-3 | Access Timing Functions | 3-8 |

SECTION 1

GENERAL DESCRIPTION

INTRODUCTION

The CONTROL DATA® TB304 Field Test Unit (FTU) is a portable, self-contained tester for exercising and/or simulating on-line operations in Storage Module Drives (SMDs), series BJ4, BJ5, BJ7, BK4, BK5, BK6 and BK7, as well as Mini-Module Drives (MMDs) in the BZ3 or BZ4 series.

The FTU is housed in a suitcase-type carrying case that provides a control panel, a logic board, and an integral power supply. The case contains space for storing the power cable, all necessary I/O cables, and a head alignment card.* The head alignment card plugs into the logic chassis of the SMD and permits individual head alignment, using a null meter mounted in the FTU control panel. In addition, a special I/O bypass cable is provided that enables head alignment and servo maintenance to be performed without disconnecting the I/O cables between the drive and its controller.

SPECIFICATIONS

Specifications for the TB304 are given in table 1-1.

FUNCTIONAL DESCRIPTION

The TB304 provides five access (seek) modes, four read/write modes, and two modes for determining head selection.

ACCESS MODES

Direct Seek

The drive under test will perform a single seek to the track number set in the CYLINDER ADDRESS switches on the FTU control panel.

Continuous Seek

The drive under test will perform repetitive seeks between any two tracks selected by the operator. Operation will continue until the START/STOP switch on the FTU control panel is moved to STOP (STOP switch actuated).

Sequential Forward Seek

The drive under test will perform single-track incremental seeks until the last track is reached, then seek to track 00 and continue

incremental seeks in the same manner until the STOP switch is actuated.

Sequential Reverse Seek

The drive under test will perform single-track decremental seeks, starting with the track nominated by the CYLINDER ADDRESS switches, until track 00 is reached. The drive will then return to the nominated track and repeat the operation until the STOP switch is actuated.

Random Seek

The drive under test will perform seeks to random tracks as selected by a free-running counter within the FTU. Operation will continue until the STOP switch is actuated.

READ/WRITE MODES

The TB304 generates serial NRZ write data at a rate determined by the servo clock signals transmitted from the unit under test. When a repeated access mode is selected (that is, any mode except Direct), a read/write operation will be completed at the selected cylinder, after which a seek will be initiated to the next cylinder address (as determined by the access mode) and the read/write operation repeated. This seek-read/write sequencing will continue until the STOP switch is actuated or an error occurs. For Direct seeks, the R/W operation will continue at the selected track or cylinder (depending upon the head select mode) until the STOP switch is actuated.

The number of tracks read or written during each R/W operation is controlled by the mode of head selection chosen. For manual head selection, only the track under the head selected by the HEAD ADDRESS switches will be read or written. For sequential head selection, the heads will be sequenced so as to read or write each track in the cylinder. When the highest-numbered head (or cylinder track) has been exercised, the drive will seek to another cylinder (except in Direct Seek) and the R/W operation will be repeated at that new cylinder, starting with head 00.

Write Format

When the FTU WRT-RD SELECT switch is set to WRT FORMAT, the FTU will write each selected

* Head alignment card not supplied with TB304C.

TABLE 1-1. TB304 SPECIFICATIONS

| Characteristic | Condition | Specification |
|----------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Size | L x W x H | 20.5 x 16.0 x 8.0 inches (52.0 x 40.6 x 20.3 cm) |
| Weight | | 43 lbs (19.5 kg) |
| Temperature | Operating | +60°F to +90°F (15.5°C to +32°C) |
| | Gradient (rise per hour) | +12°F (+6.6°C) |
| | Non-operating | +30°F to +150°F (-34°C to +66°C) |
| Relative Humidity (no condensation) | Operating | 20% to 80% |
| | Non-operating | 5% to 95% |
| Altitude | Operating | -1000 ft to +10,000 ft (-306 m to +3048 m) |
| | Non-operating | -1000 ft to +35,000 ft (-306 m to +10.7 km) |
| Input Power | 50/60 Hz, single phase | 120 (+8, -18) V ac @ 1.5 A, max. 240 (+17, -27) V ac @ 0.8 A, max. (conversion is via terminal board in power supply) |
| Minimum Input Voltage | 120 V ac | 90 V ac (100 V ac nominal, ±10%) |
| | 240 V ac | 180 V ac (200 nominal, ±10%) |

track with the appropriate track address and a repetitive 8-bit data pattern that has been set in the DATA PATTERN switches on the FTU control panel. The FTU also provides a means for indicating a defective track when using the Write Format mode.

Write

When the FTU WRT-RD SELECT switch is set to WRT, the FTU will write the repetitive 8-bit data pattern on the selected track, after having first read and verified the track address.

Read

When the FTU WRT-RD SELECT switch is set to RD, the FTU will read the data from the

selected track, after having first read and verified the track address.

Write Then Read

When the FTU WRT-RD SELECT switch is set to WRT•RD, the FTU will verify the track address and write the 8-bit data pattern on the selected track during one revolution of the drive, then verify the track address and read back the data during the second revolution.

A fifth position (OFF) of the WRT-RD SELECT switch is available for "access only" operations. This position is also used during the head alignment procedure.

SECTION 2

OPERATION

INTRODUCTION

This section provides installation information for the TB304, including the purpose and use of the various cables supplied with the tester, and gives detailed operating instructions for the many test procedures that are possible with the FTU. A general view of the FTU and its associated hardware is shown in figure 2-1.

INSTALLATION

OPERATING VOLTAGE

The FTU is connected at the factory for use with a 120-V ac 50/60-Hz power source. To reconnect for 240-V ac operation, proceed as follows.

1. Open the FTU cover. Unhinge cover and set aside if desired.
2. Raise the control panel.
3. Remove head alignment card from its compartment on top of the power supply box.
4. Remove four screws securing cover plate of power supply; remove the cover plate.
5. Remove jumper straps connecting terminals 1 and 2, and terminals 3 and 4 of ALT1.
6. Install both jumpers so as to connect terminals 2 and 3.
7. Replace and secure the power supply cover plate.
8. Replace the head alignment card in its compartment.
9. Procure a 120-to-240 V ac conversion plug from a local supply house and attach to the FTU power cord plug. Alternatively, remove the molded 3-prong plug attached to the FTU line cord and install one suitable for 240-V ac receptacles.

The FTU is now ready for 240 V ac operation.

I/O CABLES

Five I/O cables are provided. The standard A-cable has a 75-pin block-type connector on each end. The standard B-cable is equipped with two 34-pin block-type connectors. For

sites that use any of the BK series SMD's, two adapter cables are provided for converting the block connectors on the standard I/O cables to the flat connectors on the BK-series machines.

The fifth cable is the I/O Bypass cable that contains a 28-pin female connector on one end, the other end fanning out to two 14-pin male connectors. These male connectors plug into locations F01 (P1) and F06 (P2) on the FTU logic board. Pin 1 of the 14-pin connectors P1 and P2 should be aligned with pin 2 of the 16-pin locations on the logic board. The 28-pin connector (P3) connects to the drive logic chassis according to the type of drive under test. Table 2-1 provides the information needed. (See also cross-reference numbers 400 and 403 (c.r. 400, 403) in the Diagrams section.)

HEAD ALIGNMENT CABLE

SMD head alignment using the TB304A/B requires installing the special head alignment card in the proper position of the drive logic

TABLE 2-1. CONNECTING I/O BYPASS CABLE TO DRIVE

| SMD Series | Connect 28-pin connector P3 to |
|------------|--------------------------------|
| BJ4xx | JA84 |
| BJ5xx | JA3 * |
| BJ7xx | JA3 * |
| BK4xx | A02 ** |
| BK5xx | A02 ** |
| BK6xx | JA84 |
| BK7xx | JA84 |

* Plugs into card side of logic chassis. Others slip over W/W pins on back (wire-wrap) side of logic chassis at locations shown.

** Pin 1 of P3 corresponds to pin 16 of A02

NOTE

The I/O Bypass cable is useful when doing head alignment and for exercising the drive access mechanism. Read/write operations, however, cannot be performed using the Bypass cable.

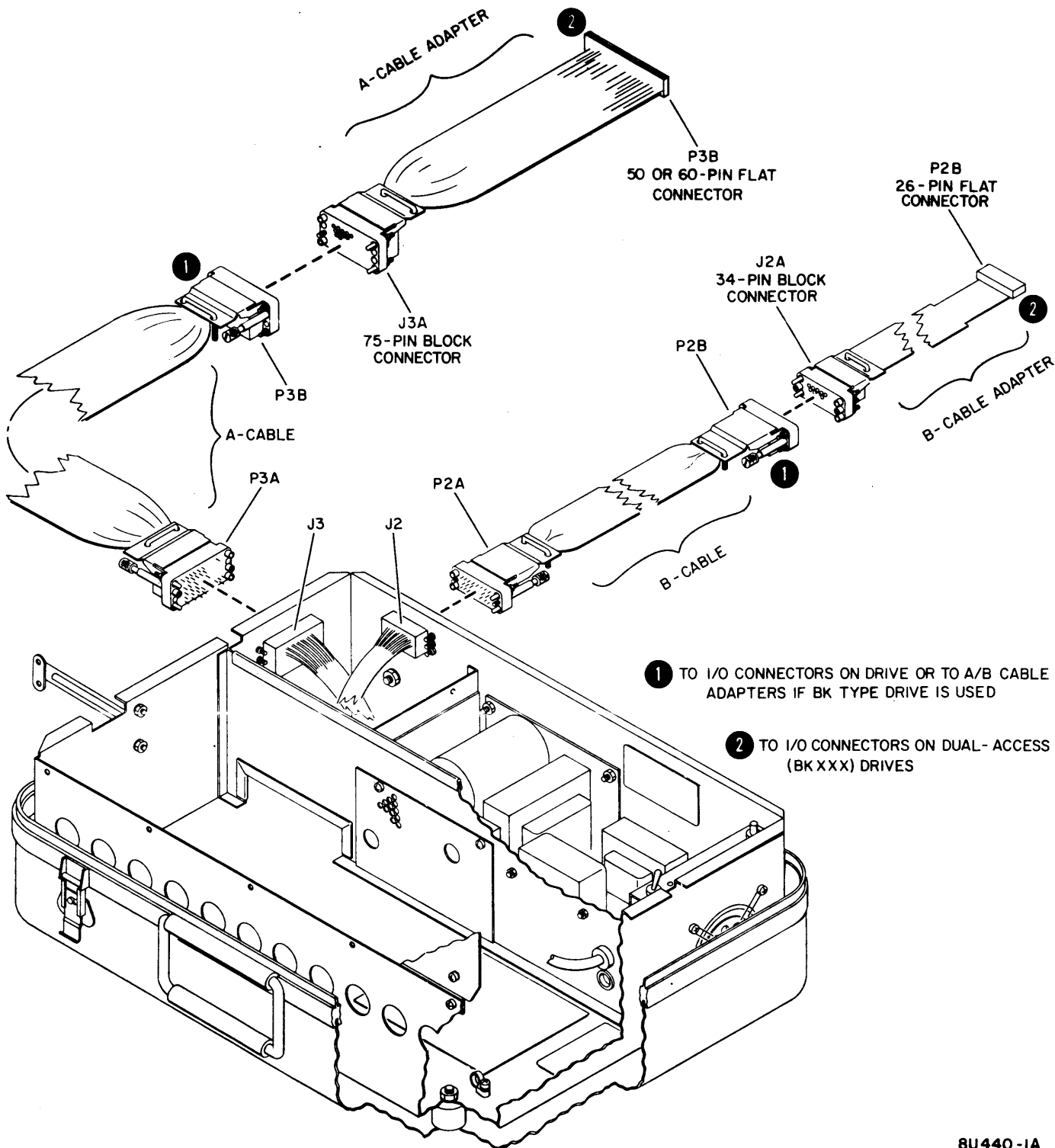
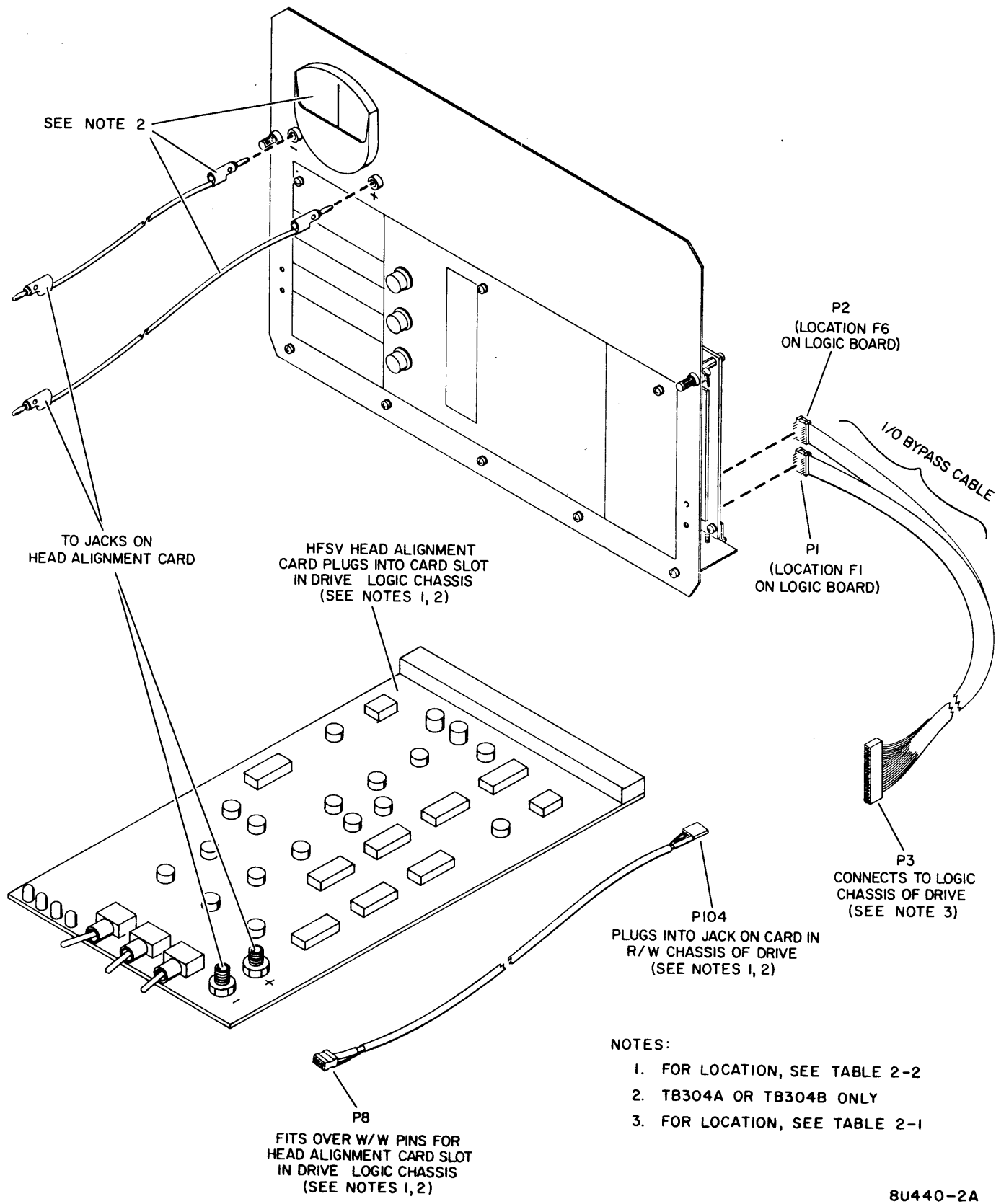


Figure 2-1. TB304 and Associated Hardware (Sheet 1)

8U440-1A





8U440-2A

Figure 2-1. TB304 and Associated Hardware (Sheet 2)

chassis, and connecting the 4-wire head alignment cable between the logic chassis and the appropriate jack in the drive's R/W assembly. Table 2-2 gives the needed information for

the various SMD series. A pair of test leads (provided) is then installed between the banana jacks on the head alignment card and the null meter on the FTU control panel.

TABLE 2-2. HEAD ALIGNMENT CONNECTIONS (SMD ONLY)

| SMD Series | Head Alignment Card Location | Head Alignment Cable | |
|------------|------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| | | P104  | P8  |
| BJ5xx | A08 | Plugs into J104 on Head Select/Read Amplifier card in R/W chassis. | Slips over W/W pins 8A,B through 11A,B at location reserved for Head Alignment card. (See column at left.) |
| BJ7xx | A08 | | |
| BK4xx | A02 | | |
| BK5xx | A02 | Plugs into J1 on Read Amplifier card in location E03 of R/W chassis. | |
| BJ4xx | A16 | | |
| BK6xx | A16 | | |
| BK7xx | A16 | | |

CONTROLS AND INDICATORS

Except for the power switch and circuit breaker mounted on the power supply box, and the sector switches mounted in location A20 on the logic board, all controls and indicators for operation of the TB304 are located on the control panel (figure 2-2). The controls and indicators are described below,

moving from top left to bottom right across the panel. An asterisk following the switch or indicator name denotes that it is for use only with the standard I/O cables. That is, the function/indication is not provided when the I/O Bypass cable is used in lieu of the standard A and B cables. Sector switch settings are given in table 2-3.

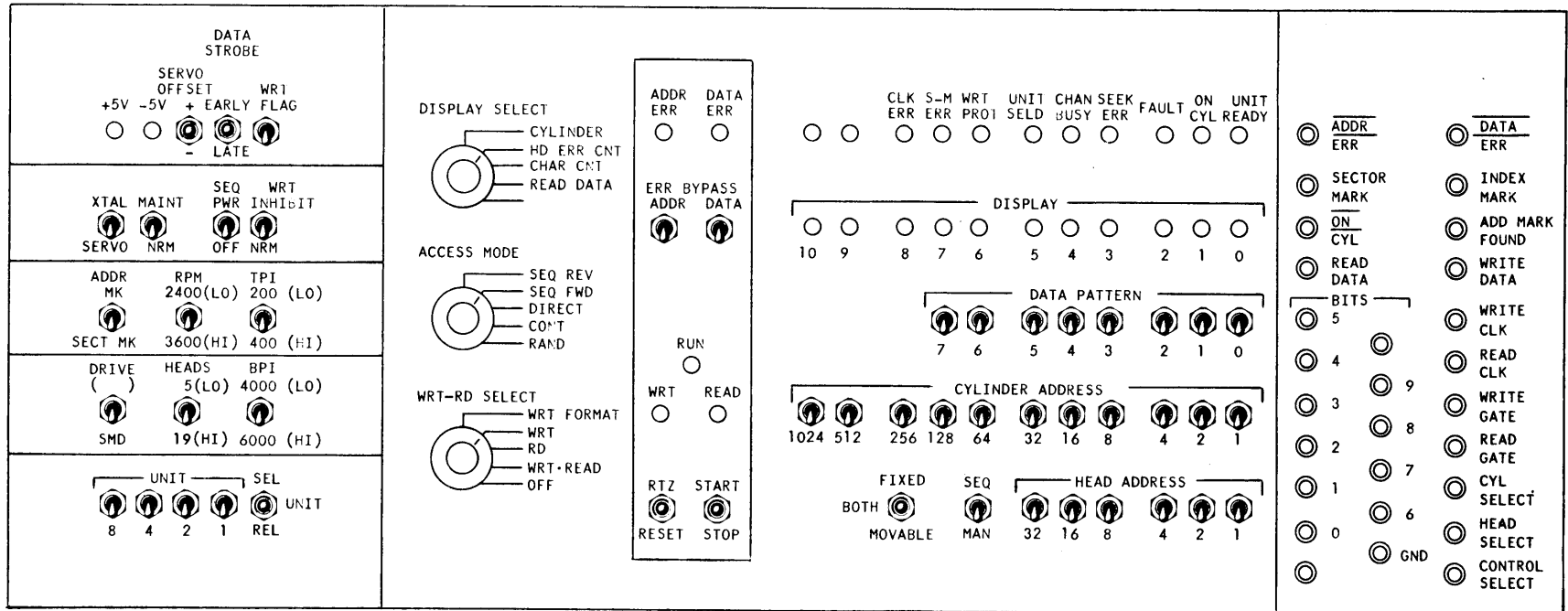
- +5 V, -5 V indicators** Indicate that the respective power supply voltages are present.
- SERVO OFFSET switch** A 3-position switch with center "off":
 - +** Commands the drive to offset the carriage in the positive direction (toward the spindle).
 - center** Nominal positioning (no offset).
 - Commands the drive to offset the carriage in the negative direction (away from the spindle).

NOTE

The START/STOP switch must be actuated to effect any change in offset by the drive when in Direct mode.

- DATA STROBE* switch** A 3-position switch with center "off":
 - EARLY** Moves the drive Read strobes from nominal to an earlier time with respect to data.
 - center** Drive strobes at nominal timing.
 - LATE** Moves the drive Read strobes from nominal to a later time, with respect to data.

- WRT FLAG* switch** When moved up, this switch causes a Defective Track flag bit to be inserted in Bit 6 of Address Word 1, provided that:
 - a. WRT-RD SELECT switch is set to WRT FORMAT
 - b. ACCESS MODE switch is set to DIRECT.
 - c. Head Select switch (SEQ-MAN) is set to MAN.



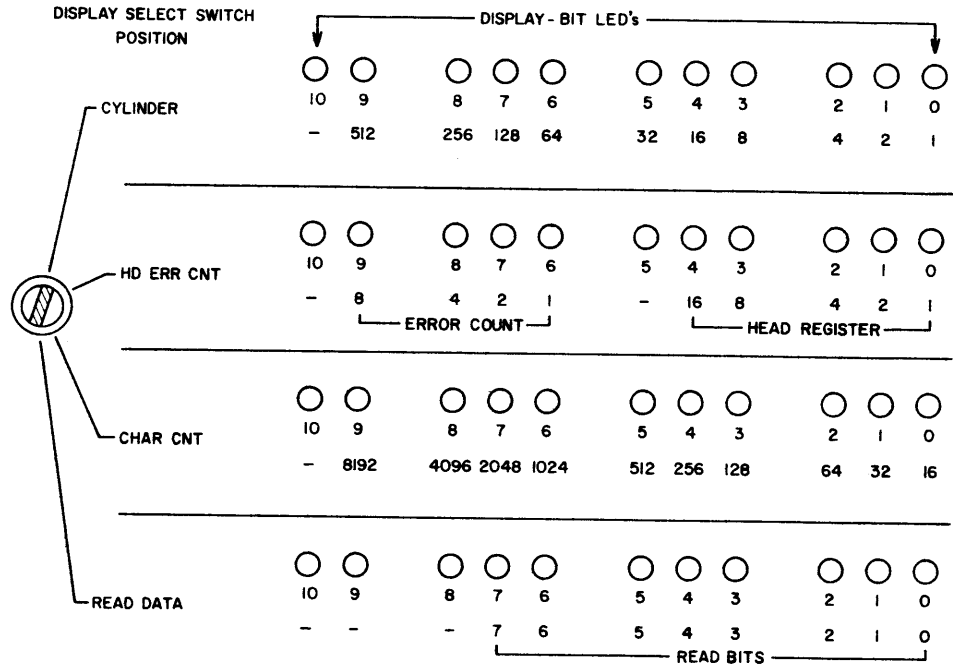
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Figure 2-2. TB304 Control Panel

| | | |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XTAL/SERVO switch | XTAL | A crystal oscillator within the FTU provides a nominal 9.667 MHz clock signal. Used for tester maintenance. |
| | SERVO | Servo Clock signals from the drive provide the basic timing for the FTU. |
| MAINT/NRM switch | MAINT | Used to perform maintenance on the FTU without a drive connected. Provides pseudo Ready and On Cylinder signals to simulate a drive response. |
| | NRM | Normal testing of a drive is done in this position. |
| SEQ PWR/OFF* switch | SEQ PWR | In this position, the FTU commands the drive to power up, provided that: <ul style="list-style-type: none"> a. The drive is in the REMOTE mode. b. Primary power is available at the drive. c. The drive START switch is ON (indicator lighted). |
| | OFF | In this position, the FTU cannot power-up the drive. |
| | WRT INHIBIT/NRM* switch | WRT INHIBIT |
| ADDR MK/SECTOR MK* switch | NRM | Allows a normal Write operation in the drive, provided that other FTU switches are set to perform a write operation. |
| | ADDR MK | The FTU writes an Address Mark when in the Write Format mode, or reads the Address Mark in other active positions of the WRT-RD SELECT switch. |
| RPM switch | SECTOR MK | Disables the writing or reading of Address Marks; permits reading of Sector Marks only. |
| | 2400 (Lo) 3600 (Hi) | } Set to speed of drive under test. (Not used in TB304A.) |
| TPI switch | 200 (Lo) 400 (Hi) | |
| DRIVE switch | () SMD | } Preconditions the RPM, TPI, BPI, and HEADS switches on the FTU panel to the parameters of the drive under test. |
| HEADS switch | 5 (Lo) 19 (Hi) | |
| BPI switch | 4000 6000 | } Must be set to correspond to the bits-per-inch rating of the drive under test. |
| UNIT* switches | 8 4 2 1 | |
| UNIT SEL/REL* switch | A 3-position, center-off switch with locking "up" end momentary "down" positions: | |
| | SEL | (locking) Sends a Unit Select Tag to the drive under test. |
| | Center | Drops the Unit Select Tag to the drive under test. |
| | REL | (momentary) Sends a Release signal for dual-access drives. Has no function for single-access drives. |

DISPLAY SELECT switch

A 4-position rotary switch that controls the eleven DISPLAY lamps on the FTU control panel. The interpretation of the display is shown below. When the switch is set on READ DATA, the cylinder address will be displayed as long as the FTU is running. The data pattern read will be displayed if the FTU has stopped because of a data error, otherwise the display will be zeros.



8U427

ACCESS MODE switch

A 5-position rotary switch that controls the Seek (access) mode of the drive under Test:

- SEQ REV (Sequential Reverse) The drive seeks to the address in the FTU Cylinder Address switches, sequences down to zero, and then repeats.
- SEQ FWD (Sequential Forward) The drive performs a series of incremental seeks, starting with the address that is in the Cylinder Address register at the start of the operation. When maximum cylinder address is reached, the cycle begins again at address zero.
- DIRECT The drive seeks to the address in the Cylinder Address switches. Seeking to another address requires changing the address in the switches and manually initiating another Seek operation by actuating the START switch.
- CONT (Continuous) The drive seeks alternately between the address in the Cylinder Address switches and that in the Cylinder Address register (CAR). The contents of CAR does not change during this operation.
- RAND (Random) The drive seeks to random addresses generated by increasing the count in the CAR during the time that the drive is not "on cylinder".

WRT-RD SELECT* switch A 5-position rotary switch that determines the manner in which data will be exchanged between the FTU and the drive under test:

WRT FORMAT (Write Format) Writes an Address Mark (if selected), the correct Track Address (HA and CA), and a pre-selected 8-bit Data Pattern field on each selected track. The format is as shown in figure 2-3.

WRT (Write) Writes a pre-selected pattern in the Data field of each selected track, after first verifying the Track Address.

RD (Read) Verifies the Track Address, then reads the selected track.

WRT•READ (Write Then Read) Verifies the Track Address, writes the Data field on the selected track, then reads the track. (Operation requires two revolutions.)

OFF Disables all Read/Write functions; restricts the drive under test to Seek operations only.

ADDR ERROR* indicator Indicates that the address information received from the drive differs from the address requested, or that an Address Mark is missing when reading in the Address Mark mode, or that the Address sync bit was not received from the drive.

DATA ERROR* indicator Indicates that the 8-bit data pattern received from the drive differs from the pattern set in the DATA PATTERN switches.

ERROR BYPASS* switches

ADDR (Address) If this switch is in the "up" position, it allows the FTU to continue operating when an Address or S-M error occurs. In the "down" position, an Address error will stop the FTU.

DATA If this switch is in the "up" position, it allows the FTU to continue operating when a Data error occurs. In the "down" position, a Data error will stop the FTU.

RUN indicator Indicates that the FTU is running or that the RTZ switch (Return to Zero) is being actuated. Five conditions will turn off the indicator.

- Returning the RTZ switch to neutral (but provided that RUN was not lit before the RTZ operation).
- A valid (unbypassed) error.
- Actuating the STOP switch.
- Actuating the RESET switch
- If the Ready signal from the drive goes low.

WRT indicator Indicates that the FTU is writing.

RD indicator Indicates that the FTU is reading.

RTZ/RESET switch A 3-position momentary switch with center "off":

RTZ Clears HAR and CAR; clears the drive's Fault register and causes the drive to perform a Return-to-Zero seek. The RUN light on the FTU control panel will be lit as long as this switch is actuated to the RTZ position.

center Neutral position.

RESET Clears the Error FF's in the FTU and the drive. This switch must be actuated after a valid error has occurred in order to be able to restart the FTU.

START/STOP switch A 3-position momentary switch with center "off":

START Generates a pulse that starts the FTU; turns on the RUN indicator. An existing Error condition must be cleared by actuating the RESET switch before START will have any effect.

center Neutral position.

STOP Stops the FTU; extinguishes the RUN indicator.

CLK ERROR indicator Indicates that a period of 200 nanoseconds has expired without a servo clock pulse from the drive under test.

S M ERROR* indicator Indicates that an incorrect number of Sector Marks was received from the drive under test between successive Index Marks.

WRT PROTECT* indicator Indicates the presence of a Write Protect signal from the drive under test.

UNIT SELD* indicator Indicates the presence of a Unit Selected signal from the drive under test.

CHAN BUSY* indicator Indicates the presence of a Channel Busy signal from the drive under test.

SEEK ERROR* indicator Indicates the presence of a Seek Error signal from the drive under test.

FAULT* indicator Indicates the presence of a Fault signal from the drive under test.

ON CYL indicator Indicates the presence of an On Cylinder signal from the drive under test, or a pseudo On Cylinder signal generated by the FTU if in Maintenance mode.

UNIT READY indicator Indicates the presence of a Ready signal. This signal comes from the drive if the A and B I/O cables are connected between the drive and the FTU. If the I/O Bypass cable is connected, this signal is present continuously.

DISPLAY indicators Refer to diagram shown for the DISPLAY SELECT switch (page 2-7).

DATA PATTERN switches These switches permit setting the repetitive 8-bit Data Pattern that is written in the Data field of the selected track during a Write operation. For Read operations, the data read from the track is compared with these switches to check for the presence of a Read error. A 1 is indicated when a switch is in the "up" position, a 0 when the switch is "down".

CYLINDER ADDRESS switches These switches enter the binary value of the cylinder address to which a Seek is desired. Used in conjunction with the ACCESS MODE switch described on page 2-7. A 1 is indicated when a switch is in the "up" position, a 0 when the switch is "down".

FIXED/BOTH MOVABLE switch This switch is functional only when the DRIVE switch on the FTU panel is in the "up" () position.

FIXED ① The FTU will access only fixed heads in the Sequential access mode. When in Random access mode, the cylinder address may not be random because of inconsistencies in clock frequency and Off Cylinder times.

BOTH ① The FTU will access both movable and fixed heads when in Sequential or Random access modes.

MOVABLE The FTU will access only the movable heads when operating in Sequential or Random access modes.

① To access all fixed heads, the SEQ/MAN head switch must be in SEQ.

| | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SEQ/MAN switch | This switch determines the manner in which the head address is selected. |
| SEQ | (Sequential) After performing a Write or Read operation the FTU increases the count in the Head Address Register by 1 for each Index Mark or, when in Random, for each access. When the count is maximum (5 or 19), Head zero is the next head selected, and the incrementing continues. |
| MAN | (Manual) The FTU will select the head address set in the Head Address switches. |
| <u>ADDR ERROR*</u> test point | This test point goes to a logical 0 when an Address Error occurs. |
| <u>DATA ERROR*</u> test point | This test point goes to a logical 0 when a Data Error occurs. |
| SECTOR MARK* test point | This test point goes to a logical 1 when the FTU receives a Sector Mark signal from the drive under test. |
| INDEX MARK test point | This test point goes to a logical 1 when the FTU receives an Index Mark signal from the drive under test. |
| <u>ON CYL</u> test point | This test point will be a logical 0 when the drive under test is On Cylinder. |
| ADD MARK FOUND test point | This test point goes to a logical 1 when the FTU receives an Address Mark Found signal from the drive under test. |
| READ DATA* test point | This test point reflects the binary value of the serial data bits being received from the drive under test during a Read operation. The test point is inoperative during Maintenance mode or when the I/O Bypass cable is installed. |
| WRITE DATA test point | This test point reflects the binary value of the serial data bits being processed by the FTU during a Write operation ("0"=0, "1"=1). The indication is valid for any Write operation, even though the I/O Bypass cable may be connected or the FTU is in the Maintenance mode. The test point remains a logical 0 during Read operations. |
| BITS 0-9 test points | These ten test points reflect the logical value of the Bus Out Bits (DOB) delivered to the drive under test via the A cable. Logically, these bits are present in the FTU's Bus Out multiplexer, and are available at the test point panel regardless of the operating mode (including Maintenance mode or I/O Bypass cable connected) of the TB304. For an interpretation of the specific Bus Out Bits, see table 3-1. |
| GND test point | This test point is a common ground point between the FTU logic board and the control panel. |
| WRITE CLK test point | This test point reflects the logic level of the 9.667 MHz Write Clock signal that the FTU sends to the drive under test during any Write operation. |
| READ CLK* test point | This test point reflects the logic level of the 9.667 MHz Read Clock signal received from the drive under test during any Read operation. A Read Error forces the test point to logical zero. |
| WRITE GATE test point | A logical 1 at this test point indicates the presence of a Write Gate signal generated by the FTU during any Write operation. |
| READ GATE test point | A logical 1 at this test point indicates the presence of a Read Gate signal generated by the FTU during any Read operation. |
| CYL SELECT test point | This test point goes to a logical 1 when the FTU sends a Cylinder Select signal (Tag 1) to the drive. |
| HEAD SELECT test point | This test point goes to a logical 1 when the FTU sends a Head Select signal (Tag 2) to the drive. |
| CONTROL SELECT test point | This test point goes to a logical 1 when the FTU sends a Control Select signal (Tag 3) to the drive. |

OPERATION

GENERAL

The TB304 is used to pin-point a problem in the drive, once the nature of that problem has been defined. Suppose, for example, that a drive is suspected of intermittent Read errors. That's the nature of the problem. The TB304 can be set up to repeatedly write and read back any chosen data pattern on a given track, or on the entire pack, or on any portion of the pack between two selected cylinders, stopping when an error occurs.

By making several such error-stop passes, and by using the DISPLAY SELECT switch to identify the cylinder, head, character count, and the data pattern read for each error stop, the CE can create a record of error parameters that will provide a failure pattern for pin-pointing the problem.

The character-count display provides an indication of how far from Index the error occurred. If you suspect a bad spot on the disk because errors consistently occur for the same head (track) and cylinder, the character count can confirm it. If the character count is random for that situation, suspect intermittent data failures on the selected head, rather than a bad spot on the disk.

That is to say, the degree of flexing to which the head lead is subject at a particular head/arm location, plus machine vibration, might cause head/write errors; but they would most logically be random errors, not occurring at the same spot for every revolution of the disk. Discriminations between random errors and honest-to-goodness bad spots are important when writing the track format on a new scratch pack, as described under Operating Procedures.

Data and address errors are the most prevalent causes for failure. The TB304 provides Bypass switches for each of these errors. This allows the FTU to alternately write and read a suspected track (or cylinder or pack area) for an extended period without stopping when an error of this type appears. After the test, the Error Count display will show the number of errors that occurred during the test period, up to a maximum of 15.

PRELIMINARY SET-UP

1. Determine which of the following conditions will be required of the drive to be tested:
 - a. The drive is to be tested for Read/Write, as well as Seek functions.
 - b. The drive is to be powered up from the FTU.

- c. Only the access (Seek) functions of the drive are to be tested.
- d. The drive need not be powered up from the FTU.
- e. Head alignment (but no R/W) of the drive is to be performed.

For conditions a or b, the A and B I/O cables from the controller must be disconnected from the drive and the I/O connections made between the drive and the FTU, via the A and B cables provided with the tester.

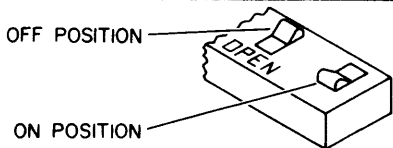
For conditions c, d, or e, the I/O Bypass cable connection between the FTU and the drive to be tested will be sufficient. Of course, any of the five conditions may be realized by connecting as shown for conditions a or b.

2. Take steps to ensure that the system will not attempt to select the drive while that drive is being exercised by the FTU.
3. Remove ac power from the drive and make the I/O cable connections as determined in step 1. Do not reapply ac power to the drive.
4. Set the Sector switches on the Field Test Unit according to table 2-3. The switches are located on a dual in-line package located in position A20 on the FTU logic board.
5. Set the following drive-oriented switches to the drive specifications:

| | |
|-----|-------|
| RPM | HEADS |
| TPI | BPI |

TABLE 2-3. SETTING SECTOR SWITCHES

| No. of Sectors | Sector Switches | | | | | | | |
|----------------|-----------------|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | ON | | | | | | | |
| 4 | ON | ON | | | | | | |
| 8 | ON | ON | ON | | | | | |
| 16 | ON | ON | ON | ON | | | | |
| 32 | ON | ON | ON | ON | ON | | | |
| 64 | ON | ON | ON | ON | ON | ON | | |
| 128 | ON | ON | ON | ON | ON | ON | ON | |
| 256 | ON | ON | ON | ON | ON | ON | ON | ON |



- Set the following switches as shown for normal testing:

| <u>Switch</u> | <u>Position</u> |
|--------------------------------|---------------------------------|
| Servo Offset | center (off) |
| Data Strobe | center (normal) |
| Wrt Flag | down (off) |
| Xtal/Servo | SERVO |
| Maint/Nrm | NRM |
| Wrt Inhibit/Nrm | NRM |
| Addr Mk/Sect Mk | ADDR MK |
| Unit (4 switches) | to logical address of the drive |
| Addr Error/Bypass | |
| Data Error Bypass (2 switches) | both down (off) |

- Install a scratch pack on the drive to be tested.
- Turn on the FTU.
- Apply ac power to the drive.
- Select the drive by placing the SEL/REL switch to SEL. The UNIT SELD indicators should light up, as will the WRT PROT indicator if the drive under test has the Write Protect Feature.
- Power up the drive. The WRT PROT lamp, if on, will go out when the drive is up to speed. The UNIT READY lamp will light up when the heads are loaded.
- Actuate the RTZ switch, then the RESET switch on the FTU panel.

The drive is now ready for exercising. It has performed a Seek to cylinder zero and has selected head zero. The remaining switches on the FTU panel may now be set for the desired function and operating modes, as illustrated in Operating Procedures.

OPERATING PROCEDURES

The first five of the procedures described below embody every access, read/write, and head-select mode provided by the TB304. Procedure 6 checks the data error logic and Procedure 7 describes the use of the head alignment card.

Procedure 1: Continuous Seek, no R/W

(Perform alternate Seeks between the cylinder address in the CAR and the address set in the CYLINDER ADDRESS switches.)

- Assure that the FTU switches are positioned as described in the Preliminary Set-up procedure. In addition, position the following switches as shown:

| <u>Switch</u> | <u>Position</u> |
|----------------|-----------------|
| Display Select | CYLINDER |
| Wrt-Rd Select | OFF |

- Set the CYLINDER ADDRESS switches to the value of one of the cylinder address to which the drive will seek. (For illustrations, choose CA 8.)
- Set the ACCESS MODE switch to DIRECT.
- Momentarily actuate the START switch. When the ON CYL indicator is lit, move the switch momentarily to STOP. Address 8 is now in the CAR, and will be displayed on the panel.
- Set the CYLINDER ADDRESS switches to the value of the second cylinder address. (For illustration, choose CA16.)
- Set the ACCESS MODE switch to CONT.
- Actuate START.
The drive will perform alternate Seeks between addresses 8 and 16. The ON CYL indicator will blink rapidly as the heads move on and off cylinder. The Cylinder Address display lights will alternate between 8 and 16.
- Stop the FTU.
- Actuate RTZ.
- Start the FTU.
The tone of the drive will change as it now seeks between cylinders 0 and 16. Observe the display.
- To stop the operation, actuate either STOP or RESET.

Procedure 2: Random Seek, no R/W

- Maintain the Preliminary Set-up switch positions. In addition, set the following switches as shown:

| <u>Switch</u> | <u>Position</u> |
|----------------|-----------------|
| Display Select | CYLINDER |
| Wrt-Rd Select | OFF |
| Access Mode | RAND |

- Actuate START.
- Assure that cylinders are being selected randomly by observing the changing pattern on the display lamps.
- Stop the FTU by actuating STOP or RESET.

NOTE

Procedure 3 through 6, following, require that the A and B I/O cables be connected between the FTU and the drive under test.

Procedure 3: Write Format

This procedure is used to write a prescribed format on every track of the disk pack. The next procedure, Read, determines whether any of the tracks so written contain errors. The final procedure, Write Flag, shows how to select a single track, write a "defective track" flag bit on that track, and check to ensure that the flag bit was indeed written. The track format is shown in figure 2-3.

- 1. Maintain the switch positions as given in the Preliminary Set-up procedure. In addition, set the following switches as shown:

Table with 2 columns: Switch, Position. Rows include Display Select (READ DATA), Access Mode (SEQ FWD), Wrt-Rd Select (WRT FORMAT), Cylinder Address (8) (all down (off)), Seq/Man (SEQ), Head Address (6) (all down (off)), Data Pattern (8) (anything but "all zeros").

- 2. Move RTZ/RESET switch to RESET, then to RTZ.
3. Actuate START.

Observe the progression of the display lights as the drive moves away from cylinder zero. (With the DISPLAY SELECT switch set to READ DATA, the cylinder address is displayed while the FTU is running.)

- 4. If an error stop occurs, remove the cause of the error by proceeding as indicated in the Trouble Analysis decision logic table on page 2-17. (Data errors will not occur during WRT FORMAT.) Then proceed as follows:
a. Actuate RESET to clear the error indication in the FTU.
b. Actuate START. This rewrites the track that was selected when the error occurred, then continues the Write Format operation.
c. Do not actuate RTZ. To do so would cause the operation to begin anew at cylinder zero, head zero.

- 5. After all tracks have been written, stop the FTU. (Writing will begin again at cylinder zero, so the actual stopping point is immaterial.)

Procedure 4: Read

This operation tests the entire data pack for errors, using the Sequential Reverse Access mode.

- 1. Set the following switches as shown. All others should remain as given for the Write Format procedure.

Table with 2 columns: Switch, Position. Rows include Display Select (CYLINDER), Access Mode (SEQ REV), Wrt-Rd Select (RD).

- 2. Set the CYLINDER ADDRESS switches to the maximum cylinder address of the drive under test.
3. Actuate START,

Reading will begin at maximum cylinder, head zero. Should an error occur, the RUN light will go out and the panel lamps will display the type of error, as well as the cylinder that was being read when the error occurred. Follow steps 4 and 5 for each separate error stop. If no errors, skip to step 6.

- 4. Record the error parameters, moving the DISPLAY SELECT switch as needed.

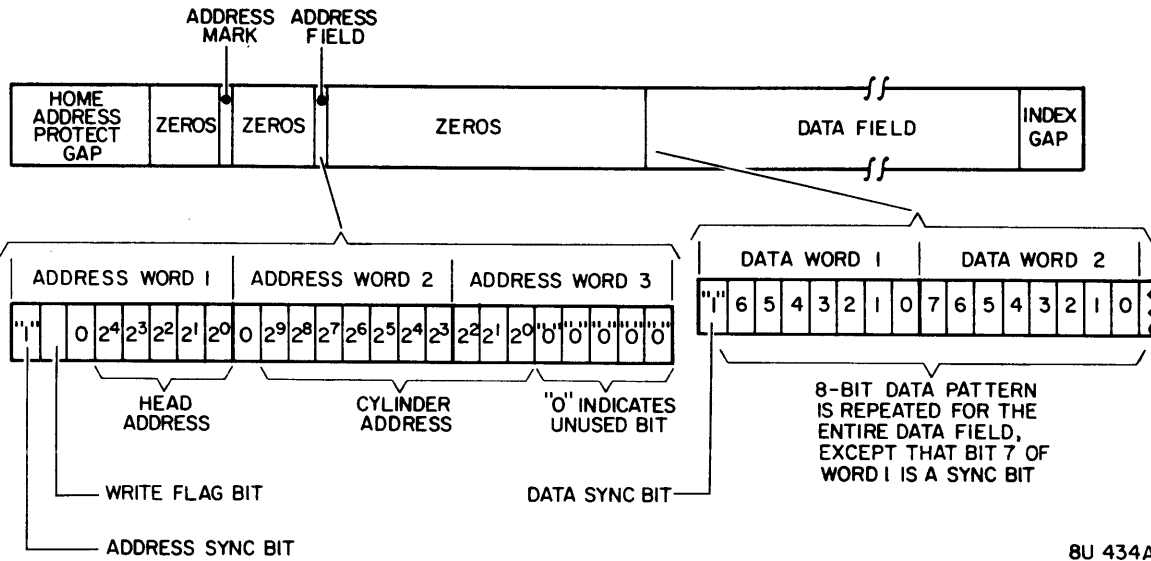
NOTE

It is not necessary to record the ERROR COUNT. This will remain at count 1 for any stop-on-error operation.

- 5. After the error parameters have been recorded, actuate RESET to clear the error indication in the FTU, then actuate START to continue reading.
6. When the FTU begins reading again at the maximum cylinder address, actuate STOP to halt the FTU.

Procedure 5: Write Flag

The above Read procedure allows for reading each track of the scratch pack but one time. A single read may well produce random errors that in an on-line environment would be eliminated by the system's error-recovery program. Before flagging a track as bad -- that is, as one that continually produces errors that are



8U 434A

Figure 2-3. Track Format

not recoverable -- it is best to WRT•RD the track several times. If the error persists, the Trouble Analysis procedure (see Procedure 7) should be executed in an effort to recover the error. Only after both of these attempts have failed, should the track be flagged.

This procedure writes a "defective track" flag bit in Bit 6 of Address Word 1 (see figure 2-3).

1. Set the following FTU switches as indicated. Other switches should remain as shown for the Preliminary Set-up procedure.

| Switch | Position |
|-----------------------|--------------------------------------------------|
| Wrt Flag | up (on) |
| Display Select | READ DATA |
| Access Mode | DIRECT |
| Wrt-Rd Select | WRT FORMAT |
| Data Pattern (8) | as set when the track was most recently written. |
| Cylinder Address (11) | } to select the track to be flagged |
| Head Address (6) | |
| Seq-Man | |

2. Actuate RESET, then START.
Drive will seek to the selected track.
3. When ON CYL light comes on, wait about 1/2 second and then actuate STOP.
4. Set WRT-RD SELECT switch to RD.

5. Actuate START.

The "defective track" flag bit will prohibit reading the track. The ADDRESS ERROR and DATA ERROR lights should not light up.

6. Actuate STOP.

Repeat steps 1 through 6 for each track to be flagged as defective.

NOTE

The WRT FLAG switch must be turned off before reading a track that has not been written as defective, otherwise an address error will occur.

Procedure 6: Check Data-Error Logic

This procedure assures the operator that data errors will be recognized by the FTU. It is used when the FTU is exercising a drive in any situation where data errors are expected -- an intermittent Read failure, for example -- but none occur. It assumes that the procedure in question is still running and that the scratch pack therefore has a data field written on the tracks being tested.

1. Stop the FTU.

- Set the following FTU switches as indicated:

| <u>Switch</u> | <u>Position</u> |
|-------------------|------------------------------------------------------------------------------|
| Wrt-Rd Select | RD |
| Data Error Bypass | down (off) |
| Data Pattern | Choose any one switch and move it to the opposite position. (Move just one!) |

All other switches must remain as they were at the start of the procedure being questioned.

- Start the FTU.

The FTU should stop with the DATA ERROR indicator lit.

- Actuate RESET to clear the error indication.
- Set the DATA ERROR BYPASS switch up (on).
- Actuate START.

The FTU should run without stopping on an error, but the Rd/Wrt Error counter will count the errors (up to 15).

- Stop the FTU. Return all switches used during this procedure to the state they were in at the start of the procedure being questioned.

Procedure 7- Trouble Analysis

Table 2-4 is a decision logic table (DLT). It shows the procedures the operator should take to eliminate any error that might occur when using the FTU to exercise a drive. Address and Data errors will, of course, occur only during one of the Read or Write modes. Others may occur for either Read/Write or Access Only (no R/W) modes. It should be noted that a Sector Mark error is not indicated if the Address Error Bypass switch is active.

Basically, the DLT deals with attempts either to eliminate or to recover data and address errors before writing a "defective track" flag on the track in error. This involves trying various Offset and Data Strobe switch combinations.

The DLT is divided into four quadrants. Each test condition (shown in the upper left quadrant) is reduced to a Yes (Y) or No (N) result, as indicated in numbered columns of the upper right quadrant, two columns being allotted for each test condition. The two lower quadrants deal with recommended actions.

To determine what actions (if any) should be executed for a given test result, follow the selected column down to the number "1" (first recommended action) in the lower right quadrant. The specific action to be taken is then located by following across to the lower

left (Actions) quadrant. After Action 1 has been taken, repeat the test that gave rise to the error condition. If the error persists, perform Action 2, test again, and so on. An "X" in the lower right quadrant indicates a "no error" or a "problem solved" situation, and requires no further remedial action.

Columns 9 through 19 (sheets 2 and 3 of table 2-4) define the sequential tests that were alluded to in the second paragraph of this procedure, and which should be made in an attempt to recover any data error. Note that the last Action item in any of these "yes" (even-numbered) columns instructs the operator to set up the next condition, or test, for re-reading the track in error. When the last of these sequential tests has failed to recover the data, then and only then should the Write Flag procedure be carried out as indicated by Action 3 of column 19.

Procedure 8: Using the Head Alignment Card *

This procedure describes the use of the type HFSV Head Alignment card and the null meter on the FTU control panel to perform R/W- and/or servo-head alignment on the SMD under test. The procedure may be implemented using either the A and B cables or the I/O Bypass cable. The cabling involved is seen in figure 2-1, and table 2-2 gives specific connection information. The switches and indicators on the HFSV card are shown in figure 2-4.

This procedure assumes that the I/O connections between the drive and the FTU have already been made as described in the Installation portion of this manual. The installation and cabling of the Head Alignment card, as detailed in table 2-2, must be made with ac power removed from the drive and the FTU.

- Install the proper CE pack on the drive to be tested.
- Install the HFSV card in the drive's logic chassis at the location specified in table 2-2 for the type of drive under test.
- Install the Head Alignment cable between the drive's logic chassis and the jack on the card in the R/W chassis, as specified in table 2-2. Note that Pl04 is keyed so that it will fit on the R/W card only one way.
- Connect the test leads, provided with the FTU, between the HFSV card and the null meter on the FTU panel. Observe polarity.
- Set the WRT INHIBIT/NRM switch on the FTU to WRT INHIBIT.
- Apply ac power to the drive. The POWER lamp on the HFSV card should light up.

* TB304A/B only.

7. Power-up the drive.
8. Assure that S3 on the HFSV card is set to X1 (no attenuation of output), and that S2 is set as required for the first head, Servo (S) or Data (RW), to be checked for alignment.
9. Turn on the FTU.

If the drive under test has the Write Protect feature, the WRT PROT light on the FTU Panel will be lit.

10. When the drive is up to speed and the READY light on the FTU panel is lit, actuate RESET, then RTZ.

Carry on as detailed by the head alignment procedure in the maintenance manual for the drive under test. When the heads have been aligned, remove the CE pack from the drive. Install the scratch pack if further tests are to be conducted using the FTU.

Installing the Head Alignment card automatically "write protects" the drive. (This is true even if the drive does not have the Write Protect feature, which merely allows Write Protect to be implemented from the drive's operator panel, and in addition provides the Write Protect signal in the I/O lines.) Therefore, if Write, Write then Read, or Write Format operations are to be conducted, the HFSV card must first be removed from the drive.

TABLE 2-4. TROUBLE ANALYSIS, SHEET 1 OF 3

| | | | | | | | |
|--------------------------------------------------------------------------------------|---|---|---|---|---|---|---|
| Assume: | | | | | | | |
| 1. A & B I/O cables connected between drive and FTU. | | | | | | | |
| 2. Power applied to FTU and drive. | | | | | | | |
| 3. ±5V indicators on FTU panel are lit. | | | | | | | |
| 4. DATA/ADDRESS BYPASS switches OFF. | | | | | | | |
| 5. FTU set to READ track format. | | | | | | | |
| 6. READ indicator comes on when START switch (on FTU panel) is actuated. | | | | | | | |
| Conditions: | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Seek error. | N | Y | - | - | - | - | - |
| Clock error in SERVO position. | N | - | Y | - | - | - | - |
| Clock error in XTAL position. | - | - | - | N | Y | - | - |
| Sector Mark error | N | - | - | - | - | Y | - |
| Drive Fault | N | - | - | - | - | - | Y |
| Actions: | | | | | | | |
| Go to sheet 2 Conditions. | 1 | - | - | - | - | - | - |
| Actuate RESET, RTZ, START | - | 1 | - | - | - | - | - |
| Refer to drive maintenance manual | - | 2 | - | - | - | 4 | 1 |
| Set XTAL-SERVO switch to XTAL; Actuate RESET, START | - | - | 1 | - | - | - | - |
| Check TP5 (WRITECLK) on FTU panel. | - | - | - | - | 1 | - | - |
| Refer to FTU diagrams. | - | - | - | - | 2 | 3 | - |
| Check B-cable for Servo Clk signal. Troubleshoot discontinuity in drive, cable, FTU. | - | - | - | 1 | - | - | - |
| Check that sector switches in FTU and drive are set correctly | - | - | - | - | - | 1 | - |
| Check TP1 (SECTOR MK) on FTU panel. | - | - | - | - | - | 2 | - |

UPPER LEFT QUADRANT: Assumptions needed for tests, as well as the test conditions.

UPPER RIGHT QUADRANT: Results of the test. N = No; Y = Yes; - = don't care.

LOWER LEFT QUADRANT: Actions to be taken for each test result.

LOWER RIGHT QUADRANT: Numbers show sequence of actions for the test results in a given column. After each Action, the test is repeated and, if needed, the next Action is taken.
X = a "no error" or "problem solved" situation.

TABLE 2-4. (CONT'D) TROUBLE ANALYSIS, SHEET 2 OF 3

| Conditions (cont'd): | 1 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|----|----|----|----|----|----|----|----|----|
| Address error | N | Y | - | - | - | - | - | - | - | - | - | - | - |
| Data error, OFFSET and DATA STROBE switches in center-off position | N | - | Y | - | - | - | - | - | - | - | - | - | - |
| Data error on WRT•RD retry | - | - | - | N | Y | - | - | - | - | - | - | - | - |
| Data error, OFFSET switch in + (FWD) position | - | - | - | - | - | N | Y | - | - | - | - | - | - |
| Data error, OFFSET switch in - (REV) position | - | - | - | - | - | - | - | N | Y | - | - | - | - |
| Data error, DATA STROBE switch set EARLY | - | - | - | - | - | - | - | - | - | N | Y | - | - |
| Data error, DATA STROBE switch set LATE | - | - | - | - | - | - | - | - | - | - | - | N | Y |
| Actions: | | | | | | | | | | | | | |
| Track was read without error | X | - | - | - | - | - | - | - | - | - | - | - | - |
| Perform WRT FORMAT for track in error; READ re-written track. | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| Perform WRT•RD retry as follows: (Set FTU switches as indicated below) WRT-RD SELECT to WRT•RD ACCESS MODE to DIRECT SEQ/MAN to MAN HD ADRS } to select CYL ADRS } failing track | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| Actuate START; check for conditions 10 or 11 | | | | | | | | | | | | | |
| Drive has demonstrated its ability to recover data. | - | - | - | X | - | X | - | X | - | X | - | X | - |
| Unrecoverable error. Perform WRT FLAG procedure for track in error. | - | 2 | - | - | - | - | - | - | - | - | - | - | - |

TABLE 2-4. (CONT'D) TROUBLE ANALYSIS, SHEET 3 OF 3

| Actions (cont'd) | 1 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|----|----|----|----|----|----|----|----|----|
| Set OFFSET switch to + (FWD) position; READ track in error. | - | - | - | - | 1 | - | - | - | - | - | - | - | - |
| ① Check Bit 2 TP on FTU panel; if missing, refer to FTU Diagrams. | - | - | - | - | - | - | 1 | - | - | - | - | - | - |
| ① Check BOB2 in drive; if missing, check I/O cable and Fwd Offset logic in drive. | - | - | - | - | - | - | 2 | - | - | - | - | - | - |
| Set OFFSET switch to - (REV) position; READ track in error. | - | - | - | - | - | - | 3 | - | - | - | - | - | - |
| ① Check Bit 3 TP on FTU panel; if missing, refer to FTU Diagrams. | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| ① Check BOB3 in drive; if missing, check I/O cable and Rev Offset logic in drive. | - | - | - | - | - | - | - | - | 2 | - | - | - | - |
| Return OFFSET switch to center-off; set DATA STROBE switch to EARLY. READ track in error | - | - | - | - | - | - | - | - | 3 | - | - | - | - |
| ① Check Bit 7 TP on FTU panel; if missing, refer to FTU Diagrams. | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| ① Check BOB7 in drive; if missing, check I/O cable and Early Strobe logic in drive. | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| Set DATA STROBE switch to LATE; READ track in error. | - | - | - | - | - | - | - | - | - | - | 3 | - | - |
| ① Check Bit 8 TP on FTU panel; if missing, refer to FTU Diagrams | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| ① Check BOB8 in drive; if missing, check I/O cable and Late Strobe logic in drive. | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| Unrecoverable error. Perform WRT FLAG procedure for track in error. | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| ① When checking for the presence of these bits, the DATA ERROR BYPASS switch must be on ("up" position). This allows reading to continue in the event of an error. The switch should be off ("down" position) when checking for the conditions. | | | | | | | | | | | | | |

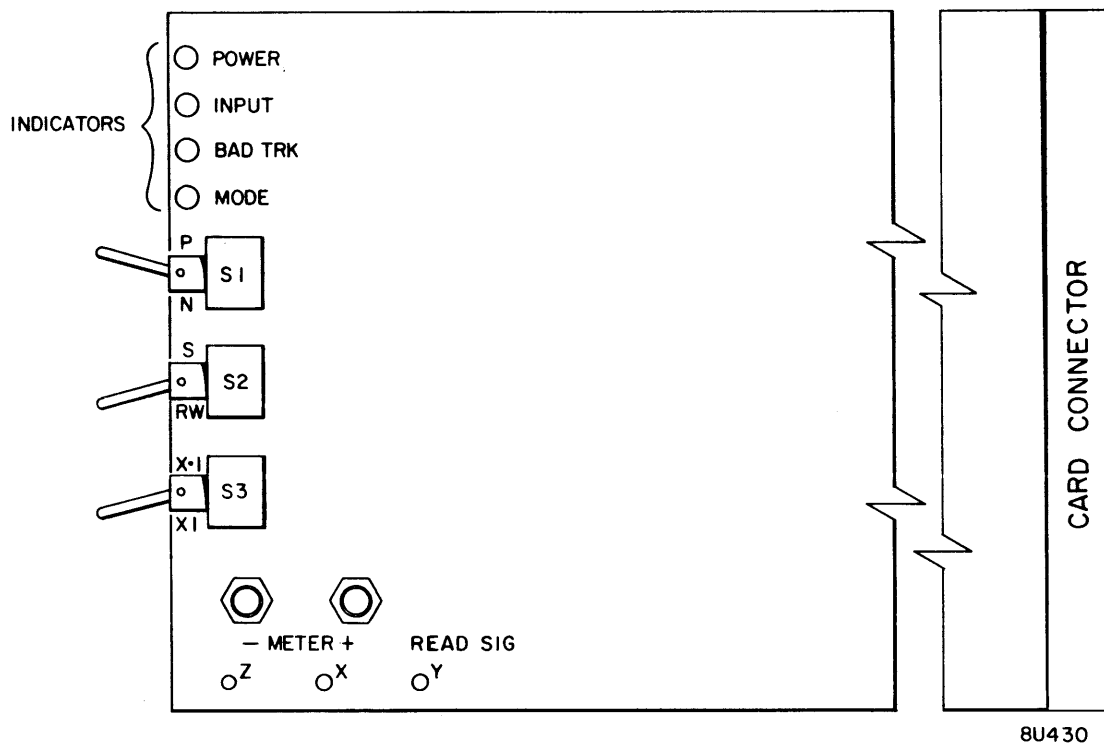


Figure 2-4. Head Alignment Card

| <u>Indicators</u> | | <u>Switches</u> | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POWER | Lit when power is applied to the card. | S1 | Changes the polarity of the alignment signal to the null meter. P = positive, N = negative. Algebraically subtract P from N to determine alignment error: P = +30 mV, N = -40 mV; Error = 70 mV. |
| INPUT | When lit, indicates that input signals are too low for HFSV to operate. | S2 | "S" position selects Servo head as input to HFSV. "RW" position selects a data head as input to HFSV. |
| BAD TRK | When lit, indicates a short duration loss of input. A one-shot keeps the LED lit for at least 4 seconds. The lamp will light when S1 is toggled. | S3 | Changes sensitivity of HFSV. "X.1" position attenuates card output by a factor of 10, and alignment error cannot be accurately measured. "XI" position does not attenuate HFSV output; alignment error can be accurately measured. |
| MODE | Lit when S2 is in the S (Servo) position or when S3 is set to X.1. When either of these conditions exists, read/write head alignment error cannot be measured. | | |

SECTION 3

THEORY OF OPERATION

INTRODUCTION

The major portion of this section consists of flowcharts that describe the logic sequencing of each access and read/write mode. In the flowcharts, 3-digit numbers above each symbol show the cross-reference number in the Diagrams section where the element named within the symbol may be found. When it is helpful to show these references in the supporting text, the cross-reference number is preceded by the letters CR, and the entire reference enclosed in parentheses. Thus, (CR 117)

refers to the diagram that has 117 in the CROSS REF NO rectangle of the title block.

A functional block diagram of the FTU logic circuits is presented in figure 3-1.

I/O LINES

Table 3-1 defines the I/O signals on the A and B cables. An asterisk after a signal name means that the signal is also present in the I/O Bypass cable.

TABLE 3-1. I/O LINES

| Signal Name | Function | | |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| "A" CABLE (TO DRIVE) | | | |
| Tag Bus Lines | Four lines that define the operation to be performed by the drive. The Unit Select Tag gates the four Unit Select lines to the drive. Tag 1 gates the cylinder address and initiates the seek. Tag 2 gates the head address. Tag 3 is the control select that gates the function to be performed. | | |
| <u>Bus Out Lines</u> | <u>Tag 1*</u> | <u>Tag 2*</u> | <u>Tag 3*</u> |
| Bit 0* | 1 | 1 | Write Gate - Enables write circuits in drive, unless drive is write protected. |
| Bit 1* | 2 | 2 | Read Gate - Enables read circuits in drive. |
| Bit 2* | 4 | 4 | Servo Offset Plus - Offsets the actuator from the nominal on cylinder position toward the spindle. |
| Bit 3* | 8 | 8 | Servo Offset Minus - Offsets the actuator from the nominal on cylinder position away from the spindle. |
| Bit 4* | 16 | 16 | Fault Clear - Pulse to clear the Fault Summary flip-flop in the drive. |
| Bit 5* | 32 | - | Address Mark Enable - When combined with a Write Gate, Address Mark is written. When combined with a Read Gate, an Address Mark search is initiated. |
| Bit 6* | 64 | - | RTZ - Pulse that causes the drive actuator to seek to track zero. |
| Bit 7* | 128 | - | Data Strobe Early - Enables the drive's PLO data separator to strobe the data at a time earlier than optimum. |

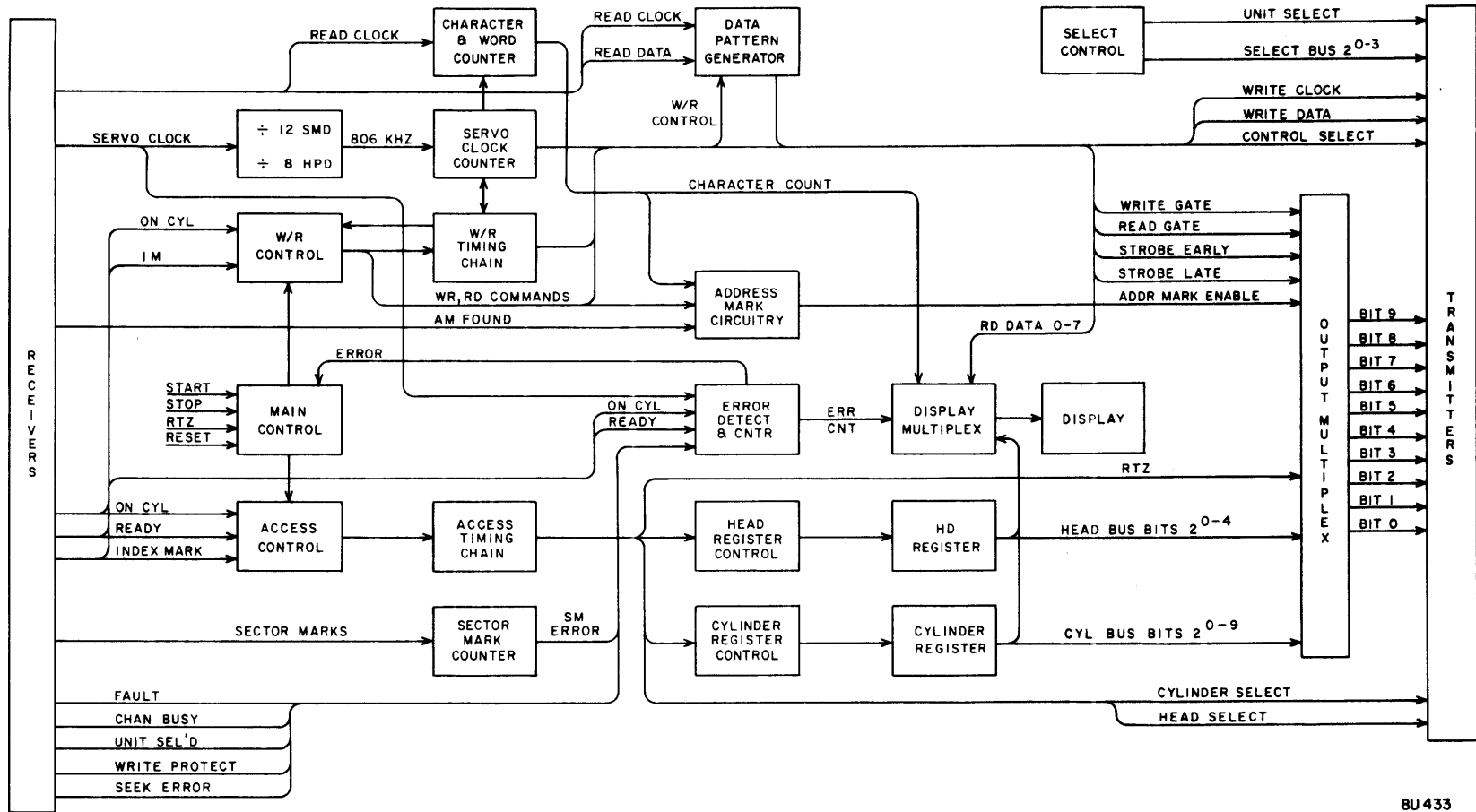
Table continued on next page

TABLE 3-1. I/O LINES (Contd)

| Signal Name | Function | | |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------|
| "A" CABLE (TO DRIVE) | | | |
| <u>Bus Out Lines</u> | <u>Tag 1</u> | <u>Tag 2</u> | <u>Tag 3</u> |
| Bit 8* | 256 | - | Data Strobe Late - Enables the drive's PLO data separator to strobe the data at a time later than optimum. |
| Bit 9* | 512 | - | Release - Pulse sent to drive to clear the Channel Reserved flip-flop. Applicable only to dual-access drives. |
| Unit Select Lines | Four lines used to select the drive. The binary code on the lines must match the code on the logic plug in the drive. | | |
| Sequence Power | Allows the FTU to power up the drive if the drive is in Remote mode. | | |
| "A" CABLE (FROM DRIVE) | | | |
| Sector Mark ① | Signal derived from the servo track. The FTU will check a maximum of 128 sector marks per revolution. | | |
| Fault | Indicates that one or more of these faults exist in the drive: DC power fault, head select fault, write fault, write or read while off cylinder, and Write Gate during a Read operation. | | |
| Seek Error | Indicates that the unit was unable to complete a move within 500 ms, or that carriage has moved to a position outside recording field. | | |
| On Cylinder* | Indicates that the servo has positioned the heads over a data track. | | |
| Index* ① | Provides a point of reference to begin R/W operations after On Cylinder has been detected. | | |
| Unit Ready | Indicates that selected unit is up to speed, heads are loaded, and no fault exists. | | |
| Open Cable Detector | Inhibits Unit Selection and any unwanted command such as Write Gate when "A" cable is disconnected or controller power is lost. | | |
| Address Mark Found* | Indicates that an Address Mark has been found. | | |
| Write Protected | Indicates that the drive is in the Write Protect state if the drive has the Write Protect option. | | |
| "B" CABLE (TO DRIVE) | | | |
| Write Data | Carries NRZ data to be recorded on disk pack. | | |
| Write Clock | Transmits the Write Clock signal. | | |
| "B" CABLE (FROM DRIVE) | | | |
| Servo Clock* | Phase-locked 9.677 MHz clock generated from the servo track dibits. | | |
| Read Data | Carries NRZ data recovered from the disk pack. | | |
| Table continued on next page | | | |

TABLE 3-1. I/O LINES (Contd)

| Signal Name | Function |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "B" CABLE (FROM DRIVE) | |
| Read Clock Seek End Unit Selected | Signal that is synchronous with the detected NRZ data. Seek End indicates that a Seek operation has terminated. When the four unit select bit lines compare with the logic plug on the control panel, and when the unit select line is true, then the Unit Selected line is true. |
| * ① | Indicates that the signal is also carried by the I/O Bypass cable. In some drives, this signal is in the B-cable instead of the A-cable. |



8U433

Figure 3-1. TB304 Block Diagram

SALIENT LOGIC ELEMENTS

Table 3-2 describes the purpose of flip-flops and registers that may not be obvious at first glance, or that are not explained else-

where in the test. The table is arranged by CR number for convenience when using the logic diagrams.

TABLE 3-2. SALIENT LOGIC ELEMENTS

| CR. No. | Element | Purpose | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------|--------------|------------------|------------|-------|------|---|------------|-------|------|---|----------------|-------|---|---|----------------|-------|----|----|---------|-----|---|-------------------------------|
| 102 | Last Access FF | Sets to indicate that a R/W operation is to follow the Seek operation now being performed. | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | Alternate FF | Used during Continuous seeks to determine whether the CAR or the Cylinder Address switches will serve as input to the drive via the Cylinder Address mux. | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | Clocked Not On Cyl FF | Enables incrementing of cyl address during Random mode. Cleared by On Cyl Detected signal to halt incrementing. | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | Sel Fixed Hd FF | Set whenever Fixed Heads AND MMD are selected from FTU panel. Cleared when either SMD or MOVABLE switch positions are selected. Toggled by + Clr Cyl signal. (See Fixed Head Operation.) | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | Hd Adrs Compar-ator | Compares current head address (in HAR) with maximum head address for drive under test, depending upon position of panel switches as shown below. <table border="1"> <thead> <tr> <th><u>FIXED/BOTH/MOVABLE</u></th> <th><u>DRIVE</u></th> <th><u>HEADS</u></th> <th><u>Max Hd No</u></th> </tr> </thead> <tbody> <tr> <td>MOV/BOTH •</td> <td>() •</td> <td>(LO)</td> <td>1</td> </tr> <tr> <td>MOV/BOTH •</td> <td>() •</td> <td>(HI)</td> <td>3</td> </tr> <tr> <td>not applicable</td> <td>SMD •</td> <td>5</td> <td>4</td> </tr> <tr> <td>not applicable</td> <td>SMD •</td> <td>19</td> <td>18</td> </tr> <tr> <td>FIXED •</td> <td>()</td> <td>X</td> <td>3 (See Fixed Head Operation.)</td> </tr> </tbody> </table> | <u>FIXED/BOTH/MOVABLE</u> | <u>DRIVE</u> | <u>HEADS</u> | <u>Max Hd No</u> | MOV/BOTH • | () • | (LO) | 1 | MOV/BOTH • | () • | (HI) | 3 | not applicable | SMD • | 5 | 4 | not applicable | SMD • | 19 | 18 | FIXED • | () | X | 3 (See Fixed Head Operation.) |
| <u>FIXED/BOTH/MOVABLE</u> | <u>DRIVE</u> | <u>HEADS</u> | <u>Max Hd No</u> | | | | | | | | | | | | | | | | | | | | | | | |
| MOV/BOTH • | () • | (LO) | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| MOV/BOTH • | () • | (HI) | 3 | | | | | | | | | | | | | | | | | | | | | | | |
| not applicable | SMD • | 5 | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| not applicable | SMD • | 19 | 18 | | | | | | | | | | | | | | | | | | | | | | | |
| FIXED • | () | X | 3 (See Fixed Head Operation.) | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | Offset Mode FF | Indicates Fwd or Rev (+,-) offset during Offset Operations. | | | | | | | | | | | | | | | | | | | | | | | | |
| | Not Offset I FF | Set when FTU is stopped, or if Offset is not in effect. Cleared at T3, or at the end of Or Cylinder Lockout delay if Offset is programmed. | | | | | | | | | | | | | | | | | | | | | | | | |
| | Not Offset II FF | Set at T3, cleared for Offset operation or during Maintenance mode. | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | Wrt Then Rd FF | A forced clear is maintained on this FF except for WRT•RD or Offset operations. When the clear is released, the FF is toggled by each IM.* This means that reading is done on every second disk revolution, and that a new head won't be selected until the second revolution (Read phase of WRT•RD) has been completed. | | | | | | | | | | | | | | | | | | | | | | | | |
| | Last Rd/Wrt FF | Set is a R/W operation is not to follow a Seek sequence, or if the current R/W is using the highest-numbered head, or if Manual head select mode is active, or if in the Random mode with Sequential head selection. Also set for an error. | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | Rd/Wrt Enable FF | Set by the Index Mark following the appearance of ON CYL if a R/W operation is to follow the Seek sequence. Cleared by Index Mark if the current R/W operation is the last before seeking to a new cylinder (Last Rd/Wrt FF set). | | | | | | | | | | | | | | | | | | | | | | | | |
| | Rd Adrs Enable FF | Set at Index time for all R/W operations except Write Format to allow the FTU to sense the sync bit at the start of the address field and to read the address field. Cleared after the address field has been read (or at Index time for a Write Format sequence). | | | | | | | | | | | | | | | | | | | | | | | | |
| * Index Mark | | (Table continued on next page) | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE 3-2. SALIENT LOGIC ELEMENTS (Contd)

| CR. No. | Element | Purpose |
|---------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 109 | Write Start FF | Enables the writing of Address Mark (AM) during a Write Format sequence. Allows writing the data field during Write (including Write Format) operations. Enables the setting of the Rd Start FF. |
| | Rd Start FF | Enables reading the AM for all R/W operations except Write Format. Enables the setting of the Rd Sync Start FF. |
| | Rd Sync Start FF | Enables sensing the sync bits and comparing the words for both address and data fields. |
| | Wrt Sync Start FF | Enables writing the data sync bit and data for a Write sequence, or writing the address/data sync bits and the address/data fields for a Write Format sequence. |
| | Sync Check FF | Cleared by the setting of Rd Sync Start FF, set when the address (or data) sync bit has been detected. If not set, the FF causes an Address (or Data) Error. |
| 110 | Wrt Gate Signal | Raises the Write Gate line to the drive (CR 120) via TAG 3 (control select). |
| | Read Gate Signal | Raises the Read Gate line to the drive. |
| 110 | Rd Compare Enable Signal | Permits comparing the address and data fields against the contents of the Word Mux (q.v.). |
| 111 | Wrt Sync/Found Sync FF | Set when either sync bit has been written (Write) or detected (Read). When set for either sync bit, enables the bit Counter. |
| | Write AM FF | Set during Write Format (only) to write the AM if the Address Mark switch is active. Gates the Address Mark Enable signal to the drive (CR 120) via TAG 3. |
| | Search AM FF | Set during all R/W operations except Write Format to initiate a search for address mark (Addr Mk Enable) when Read Gate signal is true and the Address Mark switch is active. |
| 112 | Adrs Not Complete FF | Set by Index Mark Gated (IM AND no error). Cleared at end of Address field. |
| | Not End Adrs Field FF | Set early on in the R/W cycle, this FF is cleared by the clearing of Adrs Not Complete FF to indicate the end of the Address field. When cleared, it causes the Read and Write Reset signals that clear the R/W control FFs on CR 109. |
| | Word Cntr | Active for the address field only to gate Address Words 1, 2, and 3 to the Word Mux. At end of address field, the counter sits at the count of 3 until cleared by IM Gated. That count permits the data words to be written or compared, depending upon whether Rd Gate or Wrt Gate is active. |
| 112 | Read Word Cnt Increment FF | Set when - Bit Cnt 4 goes high (at Bit Count 0) if Rd Gate is true. Prevents incrementing the Word Counter when the Bit Counter is loaded with 7 (Bit Cnt 4 high) upon the detection of the sync bit. (Refer to C.R. 111.) |
| 113 | Word Mux | Controlled by the Word Cntr (WC). Determines what is transferred to the Pattern register (q.v.) during Write operations or to the Word Comparator (q.v.) during Read operations: |

(Table continued on next page)

TABLE 3-2. SALIENT LOGIC ELEMENTS (Contd)

| CR. No. | Element | Purpose | | | | | | | | | | | | | | | |
|-------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------|---|---|---|-------------------|------------------------|-------------------------|------------------------------|------------------|--|-----------|-----------|-----------|----------|
| | | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="border: none;">WC=</th> <th style="border: none;">0</th> <th style="border: none;">1</th> <th style="border: none;">2</th> <th style="border: none;">3</th> </tr> </thead> <tbody> <tr> <td style="border: none;">Gates contents of</td> <td style="border: none;">HAR</td> <td style="border: none;">Cyl Addr Mux</td> <td style="border: none;">not used</td> <td style="border: none;">Data Pattern Sw.</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Addr Wd 1</td> <td style="border: none;">Addr Wd 2</td> <td style="border: none;">Addr Wd 3</td> <td style="border: none;">Data Wds</td> </tr> </tbody> </table> | WC= | 0 | 1 | 2 | 3 | Gates contents of | HAR | Cyl Addr Mux | not used | Data Pattern Sw. | | Addr Wd 1 | Addr Wd 2 | Addr Wd 3 | Data Wds |
| WC= | 0 | 1 | 2 | 3 | | | | | | | | | | | | | |
| Gates contents of | HAR | Cyl Addr Mux | not used | Data Pattern Sw. | | | | | | | | | | | | | |
| | Addr Wd 1 | Addr Wd 2 | Addr Wd 3 | Data Wds | | | | | | | | | | | | | |
| | Data Sync Bit FF | <p>Set by IM Gated, but has no effect until WC=3. Causes Bit 7 of Data Word 1 to be a 1, regardless of the value of the Bit 7 Data Pattern switch. (Bit 7 of Data Word 1 is the Data Sync bit.) The next Increment Word Count signal finds the FF's CD input low, and clears the FF. This ensures that the true value of the Bit 7 Data Pattern switch will be transferred to the Word Mux for all words after Data Word 1.</p> | | | | | | | | | | | | | | | |
| 114 | Pattern Reg. | <p>An 8-bit shift register with parallel and serial inputs and outputs, as follows:</p> <p>Write: Parallel inputs (from Word Mux), serial output (to NRZ Write Data FF).</p> <p>Read: Serial input (from drive), parallel outputs (to Word Comparator).</p> | | | | | | | | | | | | | | | |
| 114 | NRZ Write Data FF | <p>When cleared, will send zeros to the drive if Write Gate is high, thereby causing the drive to write the zero fields (see track format, figure 2-3). When the preclear (reset) input goes high, the FF is clocked by Clock Data pulses (servo clock signals from the drive) and either sets or clears, depending upon the state of the serial output stage in the Pattern register.</p> | | | | | | | | | | | | | | | |
| 115 | Word Comparator | <p>Active only during Read operation. Compares the serial information received from the drive, as seen in the Pattern register, against the Address or Data words, depending upon the input presented to the Word Mux. A faulty compare will cause the + Compare line to go low. If the Defective Track flag bit is present in the Address field, the Wrt Flag Detected FF will set, setting the Defective Sector FF to force + Compare high for that track. When not actually comparing, + Compare is held high (Rd Compare Enable is low) to avoid irrelevant data/address error indications.</p> | | | | | | | | | | | | | | | |
| 120 | Bus Out Mux | <p>Delivers TAG information to the drive via the A-cable transmitters (CR 123, 124) or the I/O Bypass cable (CR 403):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="border: none;">Input Selected</th> <th style="border: none;">0</th> <th style="border: none;">1</th> <th style="border: none;">2</th> <th style="border: none;">3</th> </tr> </thead> <tbody> <tr> <td style="border: none;">Output</td> <td style="border: none;">(TAG 1) Cyl Addr</td> <td style="border: none;">(TAG 2) Head Addr</td> <td style="border: none;">(TAG 3) Control Select</td> <td style="border: none;">Not Used</td> </tr> </tbody> </table> | Input Selected | 0 | 1 | 2 | 3 | Output | (TAG 1) Cyl Addr | (TAG 2) Head Addr | (TAG 3) Control Select | Not Used | | | | | |
| Input Selected | 0 | 1 | 2 | 3 | | | | | | | | | | | | | |
| Output | (TAG 1) Cyl Addr | (TAG 2) Head Addr | (TAG 3) Control Select | Not Used | | | | | | | | | | | | | |

ACCESS (SEEK) MODES

GENERAL

A Seek operation begins by setting the Access Enable FF (CR 102). This is done manually by actuating the START switch to provide the Start Access signal, or automatically by the FTU logic when the read/write sequence (if any) for the previous Seek operation has been completed.

Four elements provide the timing for the access modes.

1. Servo Clock Counter (CR 118). A hexadecimal counter that counts the servo pulses from the disk (repetition rate = 9.667 MHz). It is basically a Divide by 8 or Divide by 12 counter, controlled by the speed of the drive under test. For 2400 rev/min drives, the counter divides by 8; for 3600 rev/min drives, it divides by 12.

2. Character Counter (CR 118). A 15-stage counter that is loaded with the count of 1 for each index mark (disk revolution), providing an error has not occurred during the preceding revolution. When an error appears the counter is disabled, allowing the character count at the time of the error to be displayed.
3. Access Timing Counter (CR 103). A hexadecimal counter that is operational whenever a Seek is to be performed. The counter advances each time bit 2¹ of the Character Counter goes from high to low.
4. Access Timing Decoder (CR 103). This decimal decoder provides T-pulses (T0 through T7) from the encoded outputs of the Access Timing Counter. Table 3-3 describes how the T-pulses are used by the FTU.

TABLE 3-3. ACCESS TIMING FUNCTIONS

| Count | C.R. No. | Function Provided | Operational During |
|----------|----------|------------------------------------------------------------------------------------------------------------------------------|------------------------|
| T0 | 120 | 1. Raises Tag 2 (Head Select) to drive so as to transmit head address during any access sequence. | All R/W |
| | 120 | 2. Pseudo T0 that transmits contents of HAR to drive for each R/W disk revolution after the first (ON CYL) revolution. | All R/W |
| T1 | 104 | 1. Loads Cyl Addr Reg with contents of Cyl Addr switches if CAR=0. | Seq Rev seek |
| | 104 | 2. Increments CAR. | Seq Fwd or Random seek |
| | 103 | 3. Toggles Alternate FF. | Continuous seek |
| T2 | 104 | 1. Load CAR with contents of Cyl Addr switches. | Direct seek |
| | 106 | 2. Clear HAR unless Manual Hd Sel mode. | All R/W |
| T2.5 | 105 | 3. Load Cyl Addr Mux with contents of CAR. | All seeks |
| | 106 | 4. Decrease count in CAR (trailing edge) | Seq Rev seek |
| T3 | 123 | 1. Gate Cyl Addr to drive (Tag 1) | All seeks |
| | 107 | 2. Set Not Offset II FF | Seek with Offset |
| | 102 | 3. Set Last Access FF if R/W follows. | All seeks |
| | 107 | 4. Clear Not Offset I FF | Seek without Offset |
| T4 | 106 | 1. Load HAR with contents of head address switches if in Manual head select mode. | All R/W |
| T5 T6 | | Not Used | |
| T7 | 102 | Clear Access Enable FF (See Seek flowcharts for specific actions that occur between T7 and the start of a R/W operation.) | All seeks |
| | 107 | Clear Not Offset II FF to initiate On Cylinder Delay | Maintenance Mode |

SEQUENTIAL REVERSE (SEQ REV) SEEK

Figure 3-2 shows the Sequential Reverse Seek flowchart.

After setting all switches for the desired operation, RTZ must be actuated in order to clear the Cylinder Address Register (CAR) so that the contents of the Cylinder Address switches can be loaded into CAR at T1 of each "first seek" excursion of the Access Timing Counter. The Cylinder Address switches must contain a valid address for the device being tested or a Seek error will result.

For Sequential Reverse seeks, CAR counts down; for other operations (except Direct Seek), it counts up. An On Cylinder signal is returned by the drive after T7. Any error will reset the Run FF and Start Access delay (one-shot) to prevent further seeks.

When doing seeks only (no intervening R/W operations), Access Enable is cleared at T7, but is set again as soon as the T7 pulse disappears. (See the -T7 input to the 4-way NAND controlling the clock input to Access Enable -- cross reference 102). This permits uninterrupted seeks until a Stop, Reset, or Error condition occurs.

For any R/W operation, the Last Access FF is set at T3. This says that a R/W operation must be completed before another seek operation can be initiated. A R/W operation begins by setting the Rd/Wrt Enable FF as soon as an Index Mark is detected after the drive is On Cylinder. The leading edge of Index Mark then forces a pseudo T0 pulse that gates the contents of HAR (head address register) to the drive. The leading edge of each succeeding index mark increases the count in HAR (except for Manual head selection, shown below), and the trailing edge gates the address.

When HAR reaches maximum, the Last Rd/Wrt FF is set. This clears the Rd/Wrt Enable FF at the end of the current R/W cycle, which is signalled by the next appearance of Index Mark. With the Last Access FF cleared, as it was at the start of the R/W operation, and provided that no error stops have occurred, Access Enable again sets to initiate another seek.

For manual head selection mode, the Last Rd/Wrt FF remains set. This means that the selected track is read (written) once. The ensuing index mark then causes another seek to be initiated.

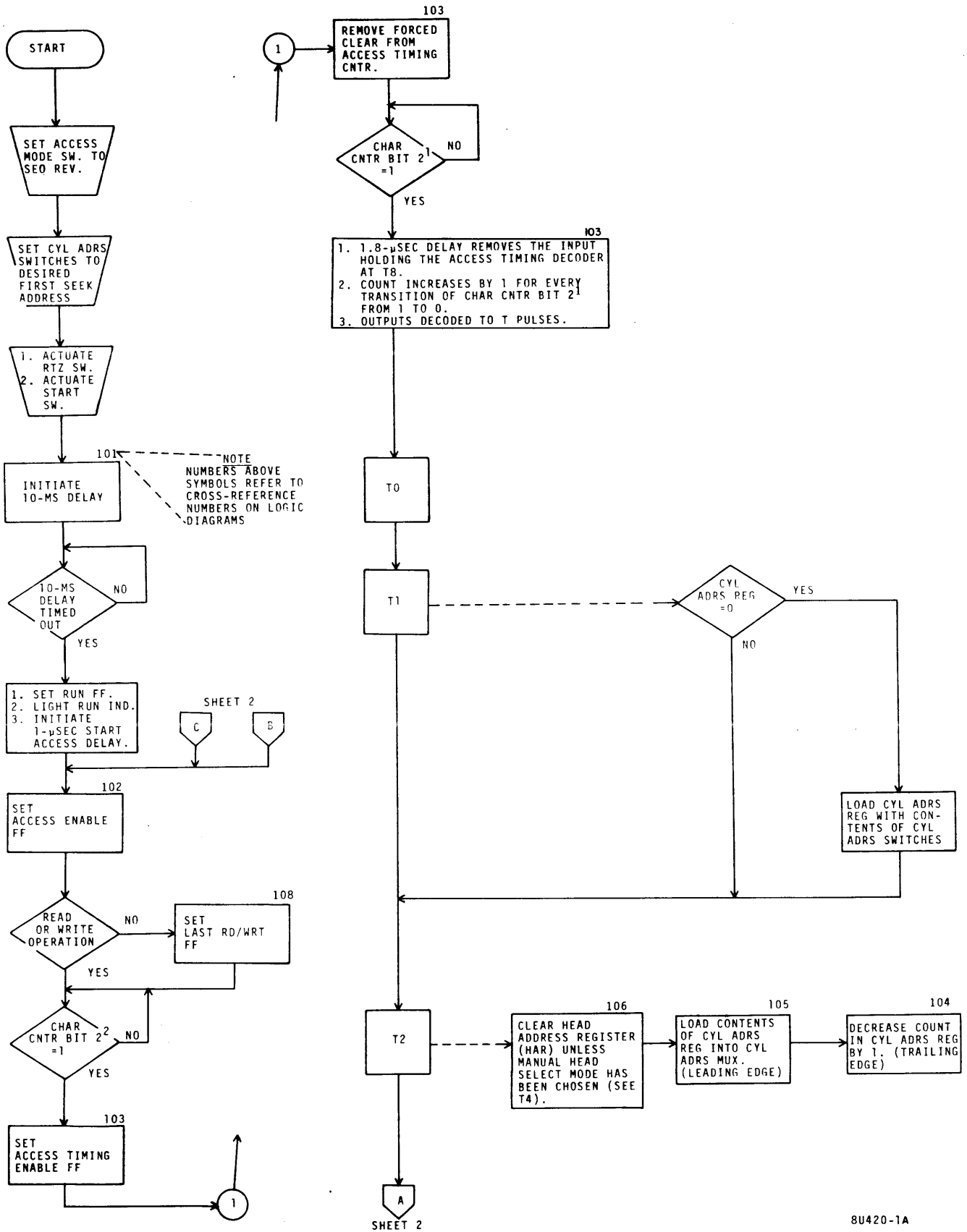


Figure 3-2. Sequential Reverse Seek Flowchart (Sheet 1 of 2)

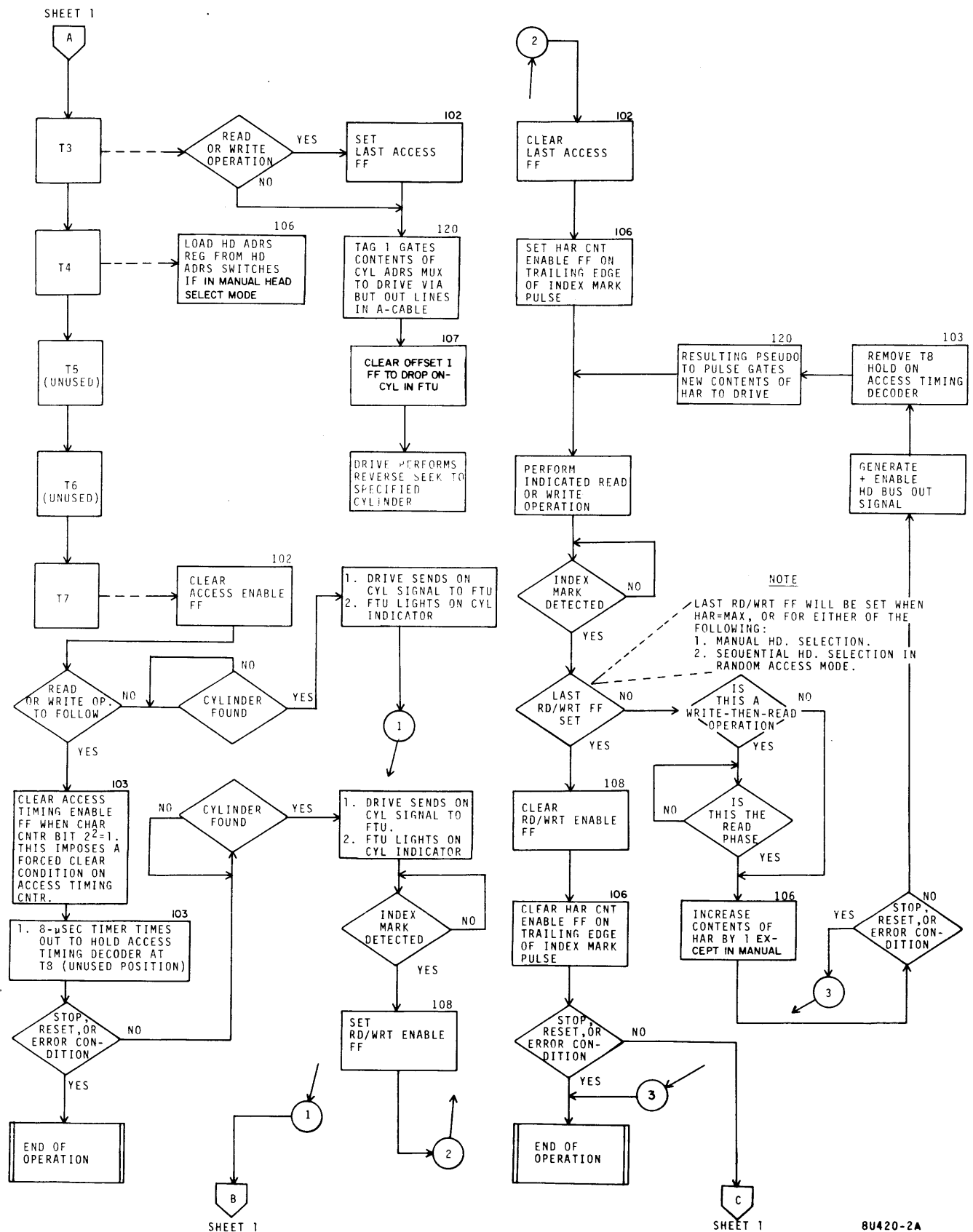


Figure 3-2. Sequential Reverse Seek Flowchart (Sheet 2 of 2)

SEQUENTIAL FORWARD (SEQ FWD) SEEK

Figure 3-3 shows the Sequential Forward Seek flowchart.

This operation is essentially the same as Sequential Reverse. The only difference is that the count in the Cylinder Address reg-

ister (CAR) is increased by 1 at T1, rather than being decreased by 1 at T2. Because the first seek address is not critical, it is not necessary to clear CAR before starting the operation. In practice, however, an RTZ seek is usually performed prior to the SEQ FWD function, so CAR will be zero.

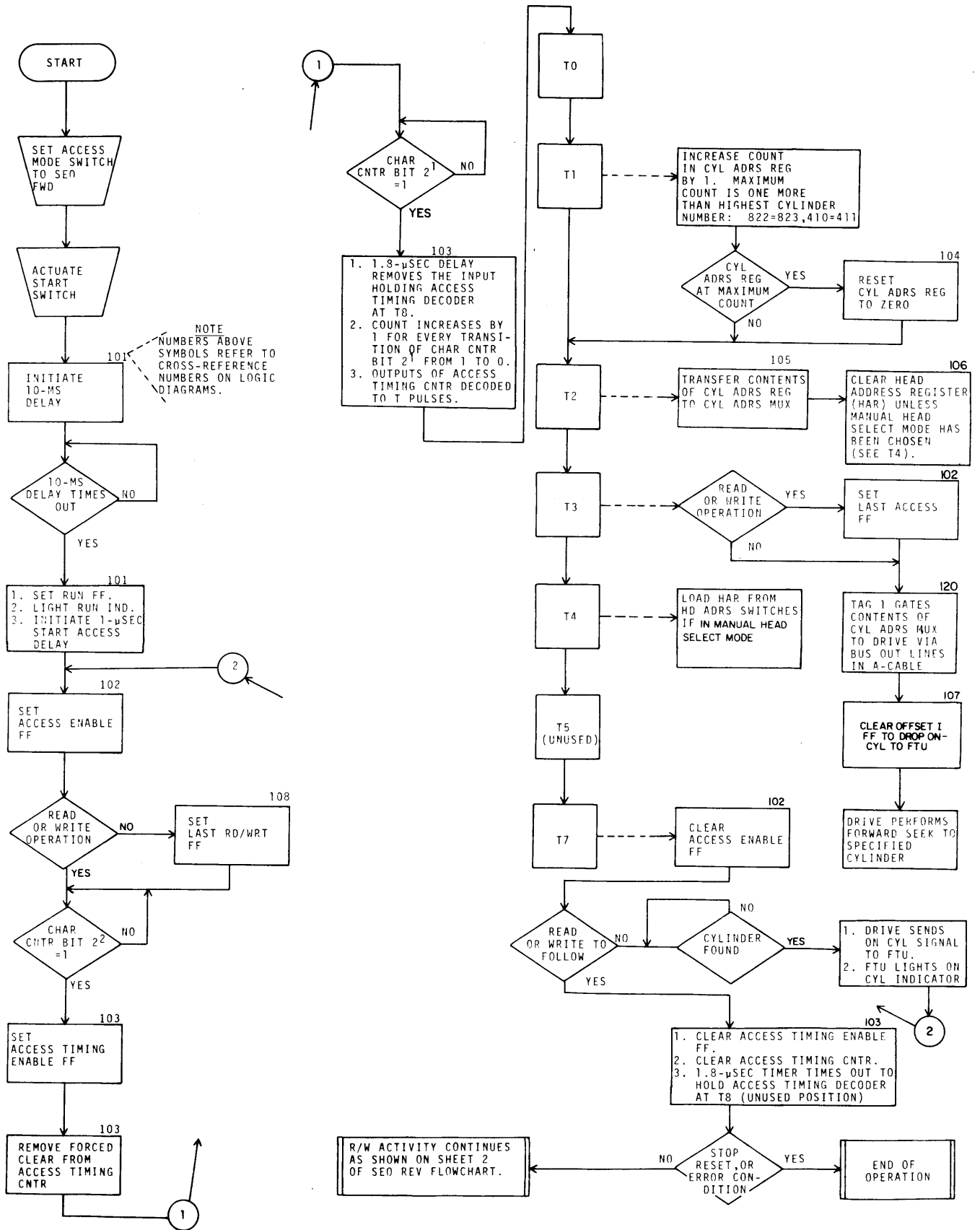


Figure 3-3. Sequential Seek Flowchart

CONTINUOUS (CONT) SEEK

Figure 3-4 shows the Continuous Seek Flow-chart.

This operation performs repeated seeks that alternate between the address set in the Cylinder Address switches and the address present in CAR at the start of the operation. The contents of CAR do not change during the operation.

The "first seek" address depends solely upon the state of the Alternate FF at the beginning of the operation. If the FF is set, it will be cleared at T1 and the contents of the Cylinder Address switches will be transferred

to the Cylinder Address Mux at T2, and thence to the drive at T3. On the other hand, if Alternate is initially in the cleared state, it will be set at T1, causing the contents of CAR to be gated to the drive at T3. Normally, an RTZ function precedes a CONT seek, and leaves the Alternate FF in the set state. The first Continuous seek, then, will be to the address set in the switches.

As with sequential FWD or REV access modes, a sequential head select mode results in reading (writing) an entire cylinder before doing the next seek. For manual head selection, the selected track is read (written) once, and a new seek initiated.

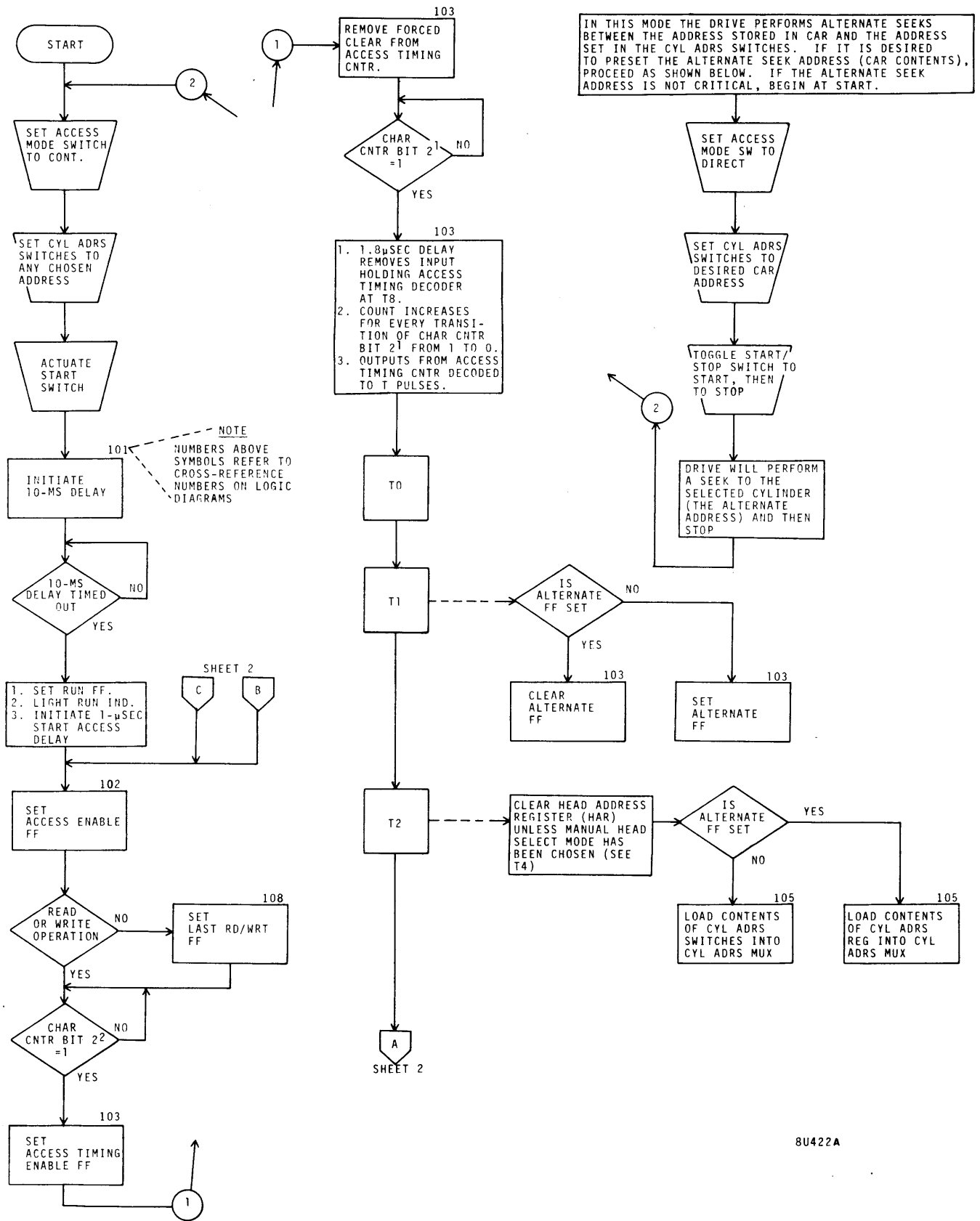


Figure 3-4. Continuous (Alternate) Seek Flowchart (Sheet 1 of 2)

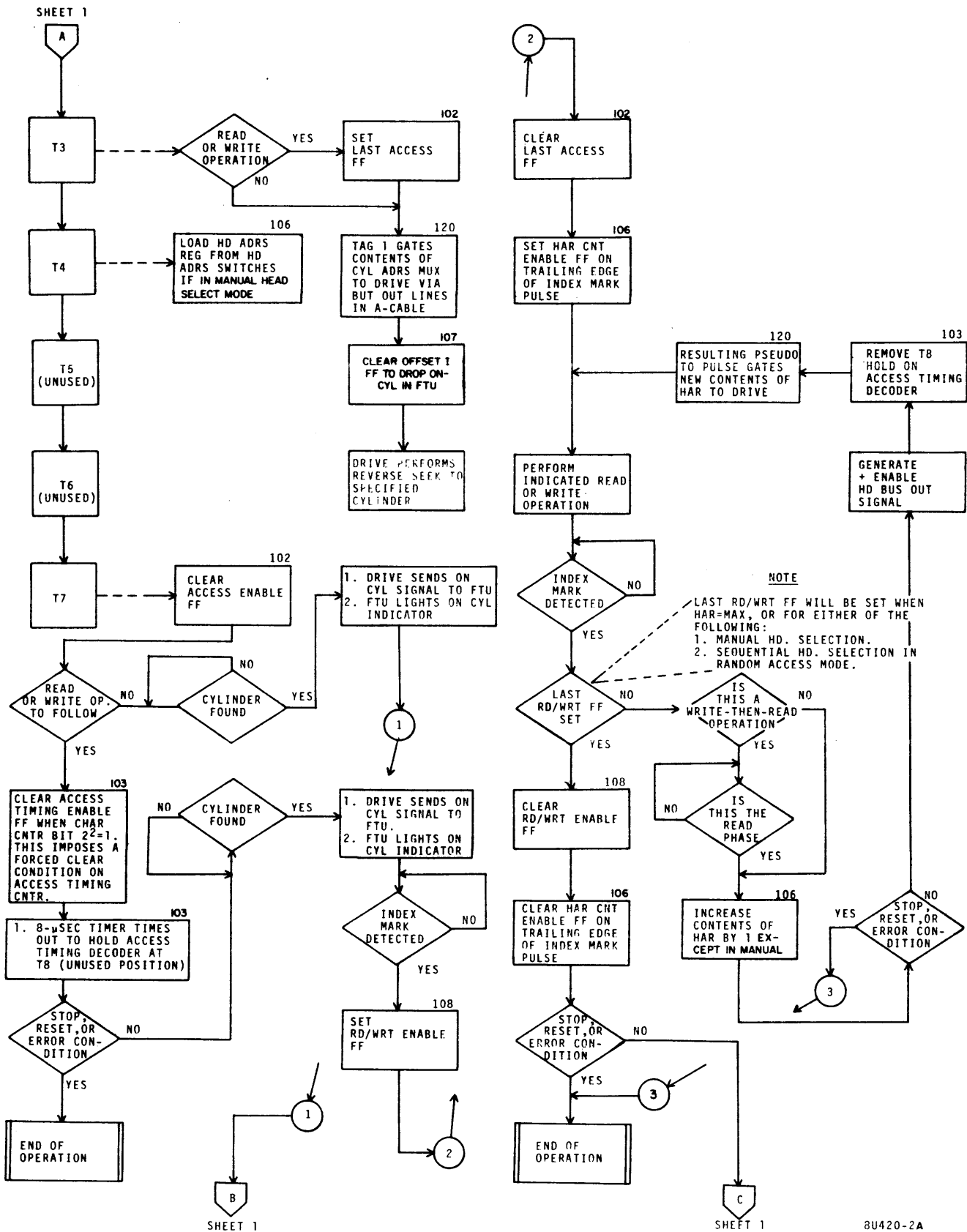


Figure 3-4. Continuous (Alternate) Seek Flowchart (Sheet 2 Of 2)

DIRECT SEEK

Figure 3-5 shows the Direct Seek flowchart.

When the access mode is Direct, the clock input to the Access Enable FF is disabled.

The FF is preset (preset input enabled) by actuating the START switch, and cleared (pre-clear or Reset input enabled) at T7. Consequently, only one seek is performed for each actuation of the START switch.

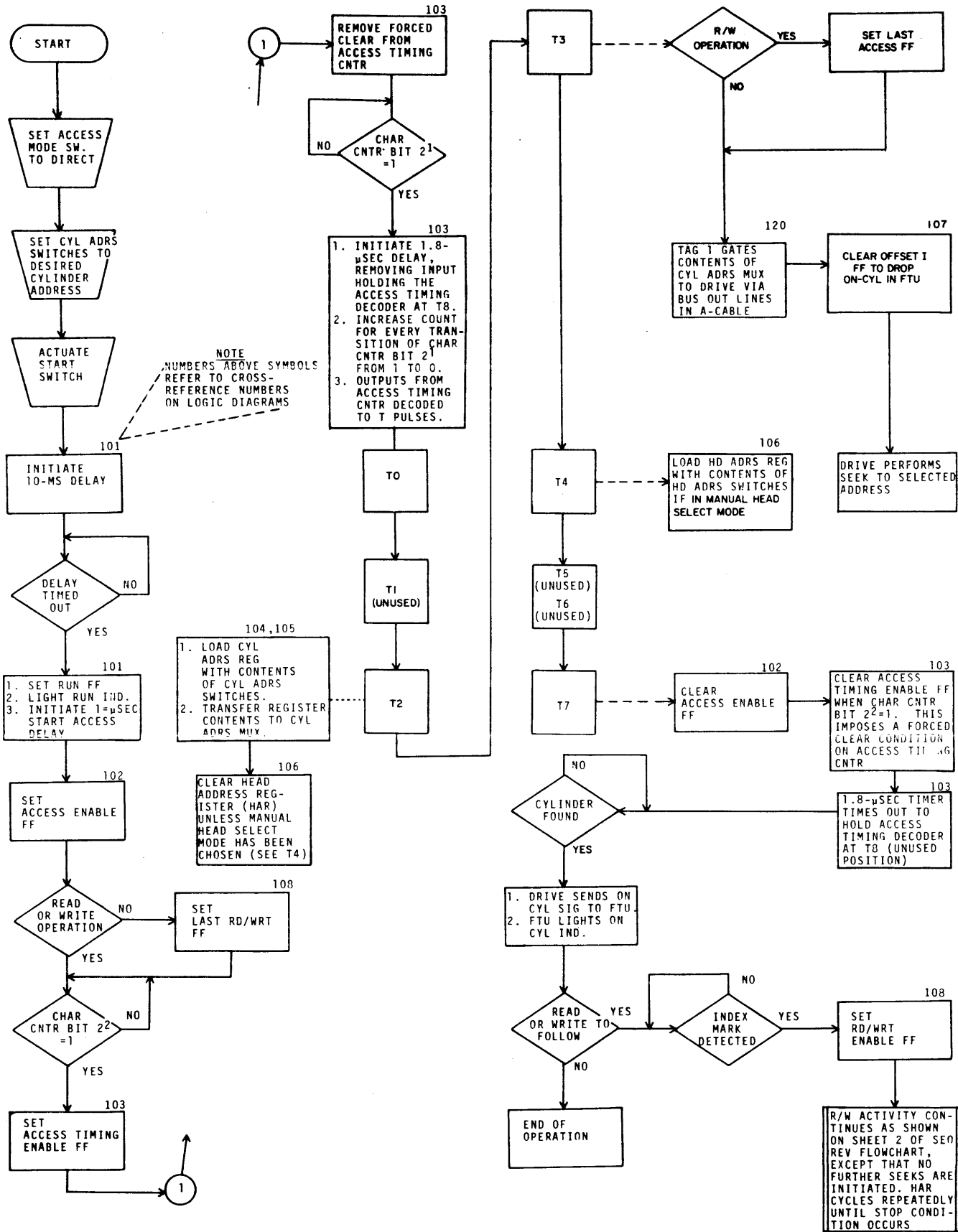


Figure 3-6. Direct Seek Flowchart

RANDOM (RAND) SEEK

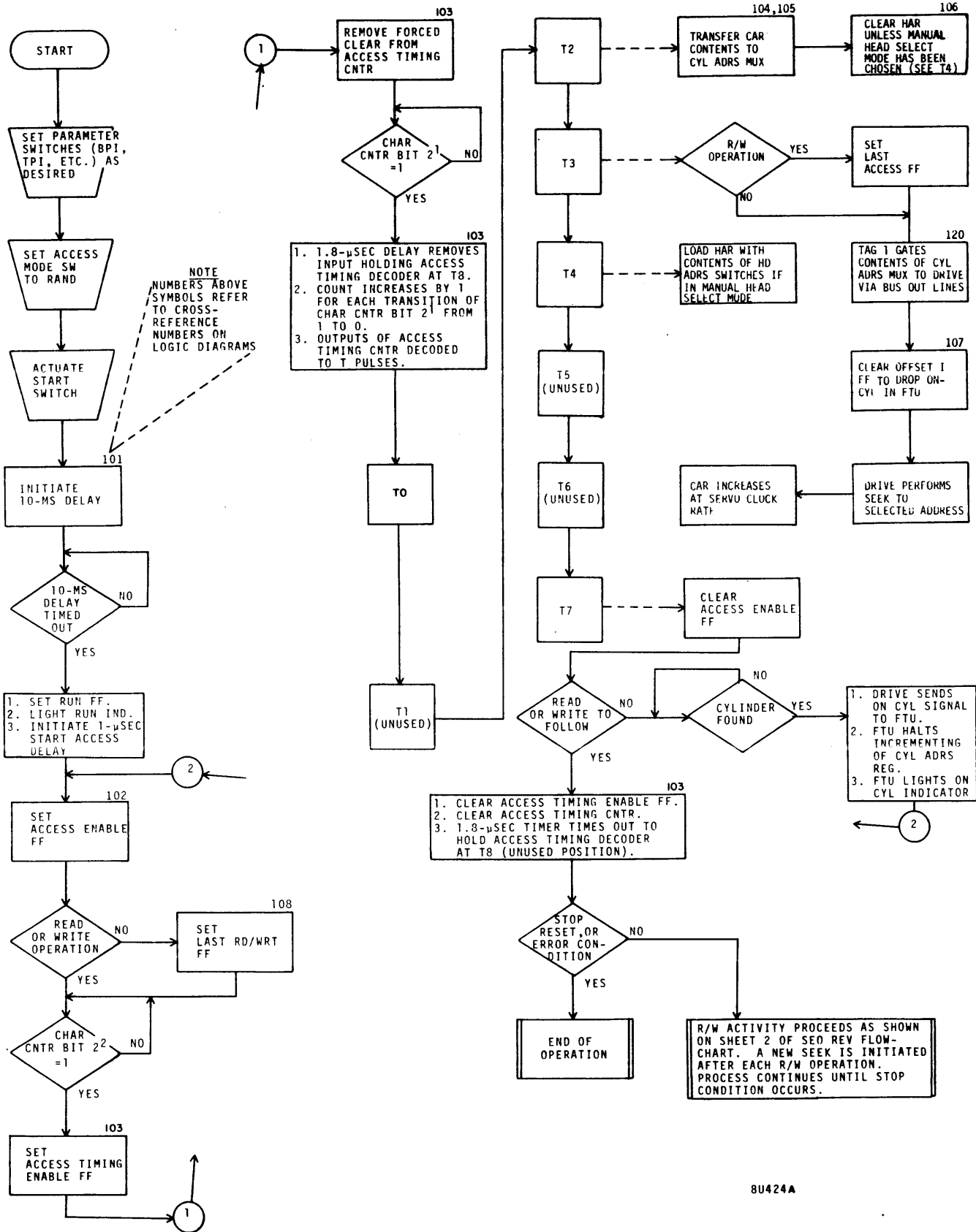
Figure 3-6 shows the Random Seek flowchart.

In this mode, the contents of CAR is increased by 1 for each servo clock pulses (FTU Write Clock) that occurs while the drive is "off cylinder". When the drive returns an On Cylinder signal, CAR stops counting and contains the address that will be sent to the drive when the next Seek command is issued.

The contents of CAR is loaded into the Cylinder Address Mux by the first 806-kHz pulse occurring during T2. At T3, this address is gated to the drive. Even if the drive is already on cylinder (as it would be, for example, if RTZ were selected just prior to

the Random operation), it brings down On Cylinder for a minimum of 30 μ sec. For the first Random seek, then, CAR counts up during this 30- μ sec period. For succeeding seeks (in Random), the counting time is determined by how long it takes the drive to move to the new cylinder and respond with the On Cylinder signal.

This operation is unique in that it does not clear HAR during a Sequential head selection. Moreover, whether in Sequential or Manual (head select modes), only one R/W operation is executed for each seek. That is to say, for Write Then Read mode, a seek is initiated for every two disk revolutions; for other R/W modes, a seek is initiated after each revolution.



8U424A

Figure 3-6. Random Seek Flowchart

READ/WRITE OPERATIONS

Read or Write operations are performed by raising the Read Gate or Write Gate signals to the drive, as shown in figure 3-7. Figures 3-8 through 3-13 show how each Wrt-Rd mode (except Write then Read, which is a combination of Write and Read operations on successive disk revolutions) affects and interprets the basic track format. Timings shown in figure 3-7 are valid for a 3600 rev/min drive, which as this is written are the only drives available for testing with the TB304. The other figures relate the track format to character counts, which are the same for either speed.

WRITE FORMAT SEQUENCE

The Write Format sequence writes an entire track from the Address Mark to the end of the data field, arbitrarily timed to coincide with character 13,376. Figure 3-8 shows the now-familiar track format, with the character counts that start and stop the various fields. Use this figure as a reference when following the Write Format flowchart (figure 3-9).

NOTE

One character is equal to 12 bits of data. One byte = 8 bits. Therefore, 2 characters = 3 bytes.

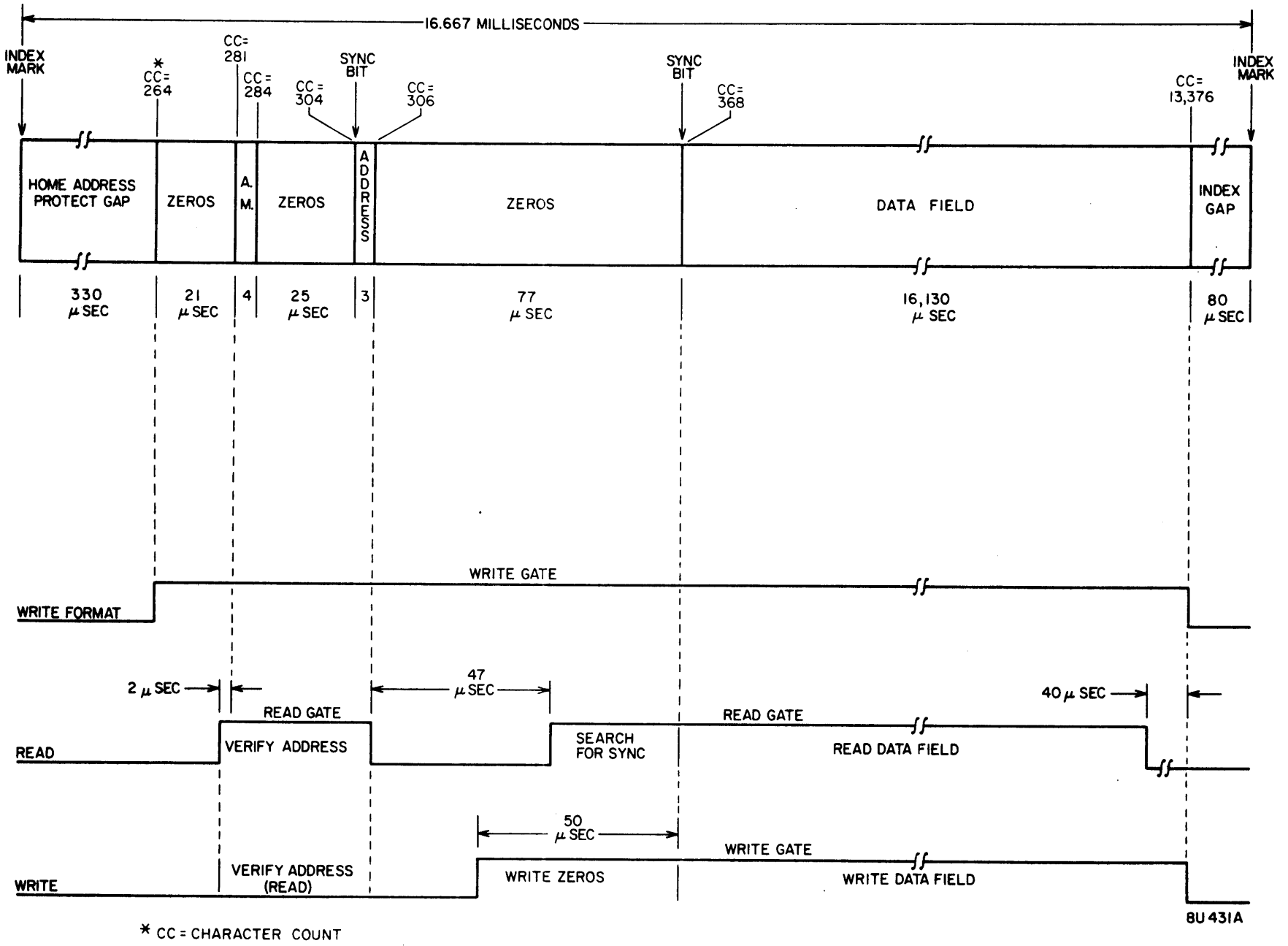
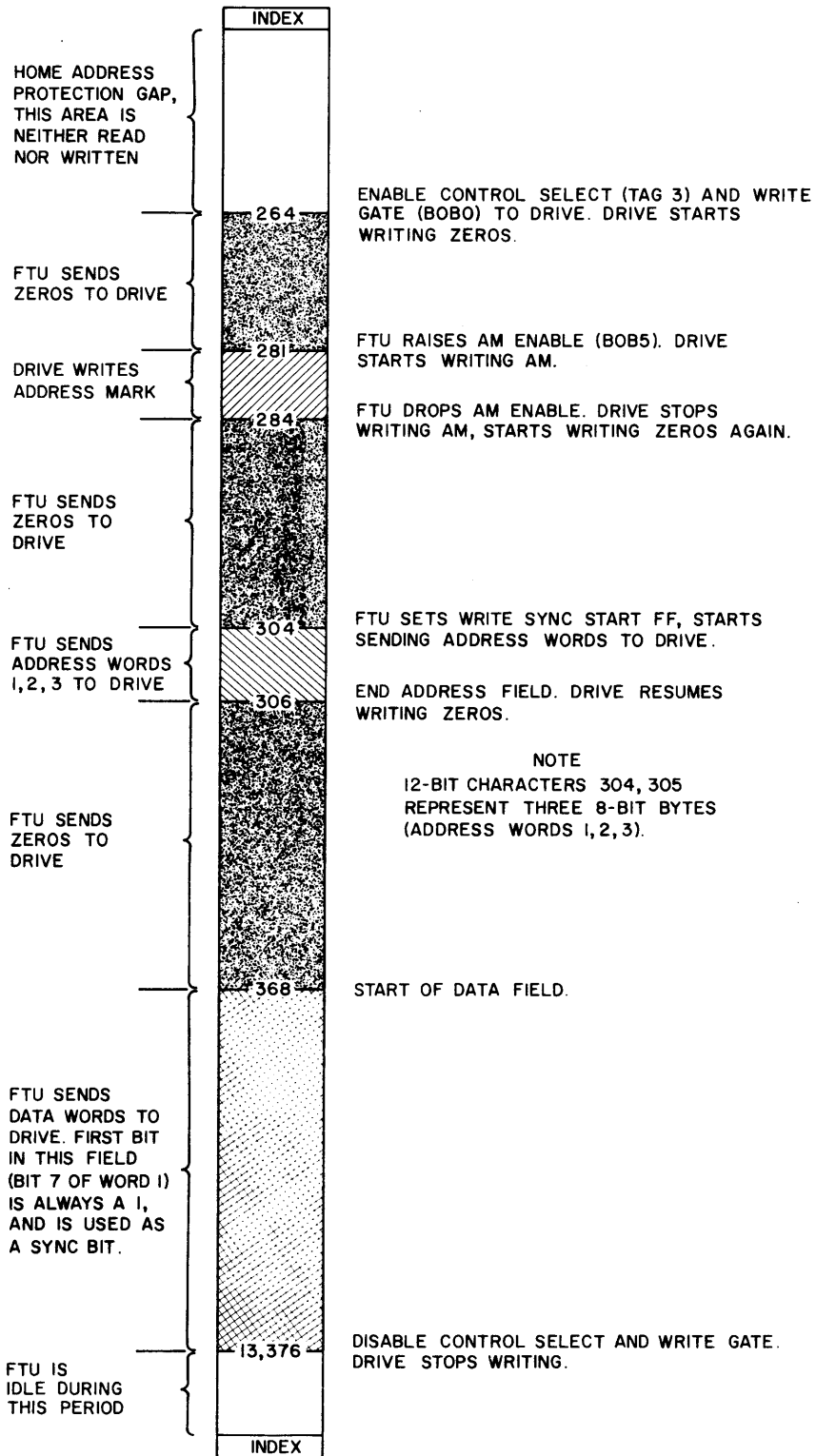


Figure 3-7. Track Format and Basic R/W Timing



8U426

Figure 3-8. Write Format Track Pattern

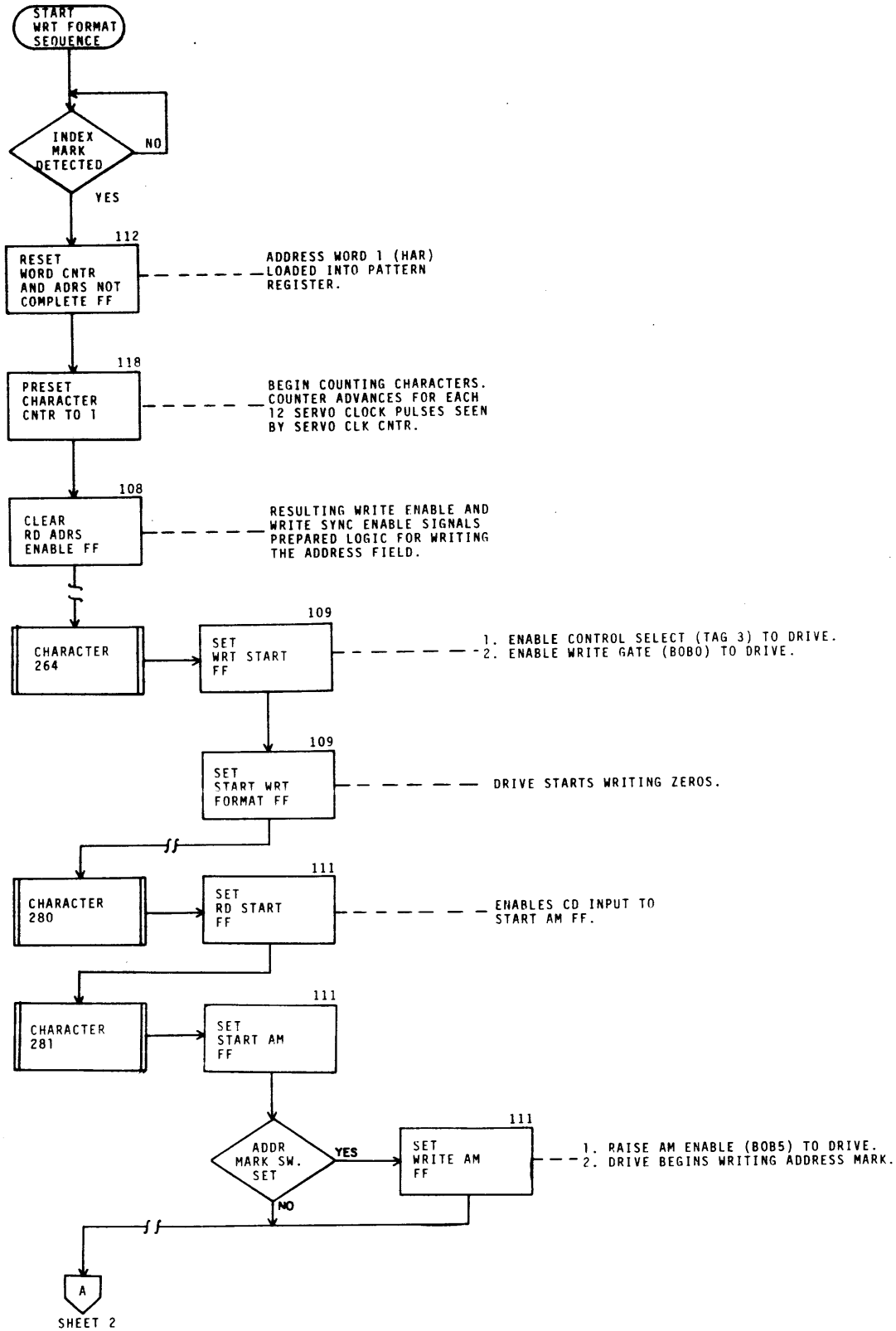


Figure 3-9. Write Format Flowchart (Sheet 1 of 5)

8U425-1

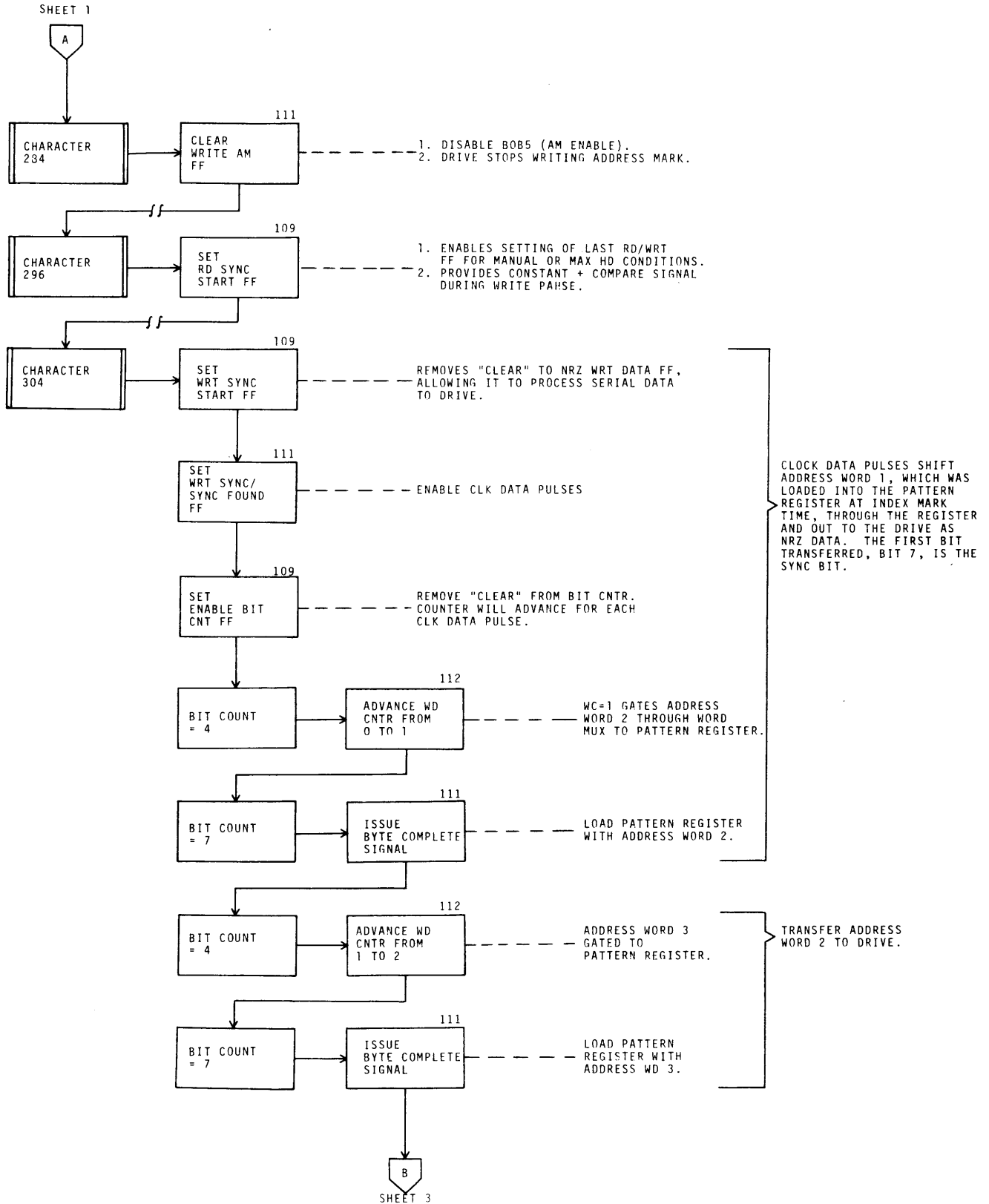


Figure 3-9. Write Format Flowchart (Sheet 2 of 5)

8U425-2

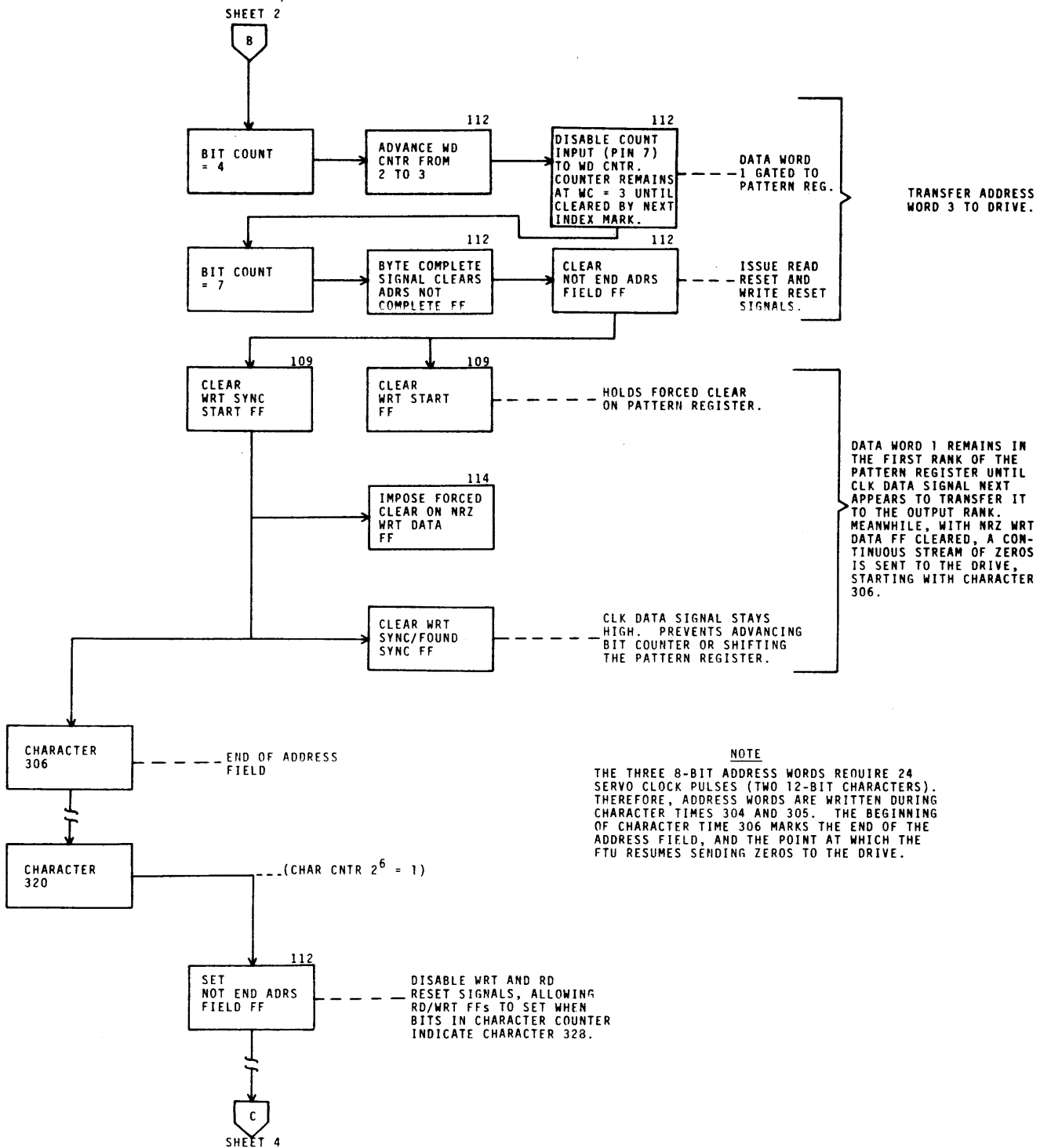


Figure 3-9. Write Format Flowchart (Sheet 3 of 5)

8U425-3

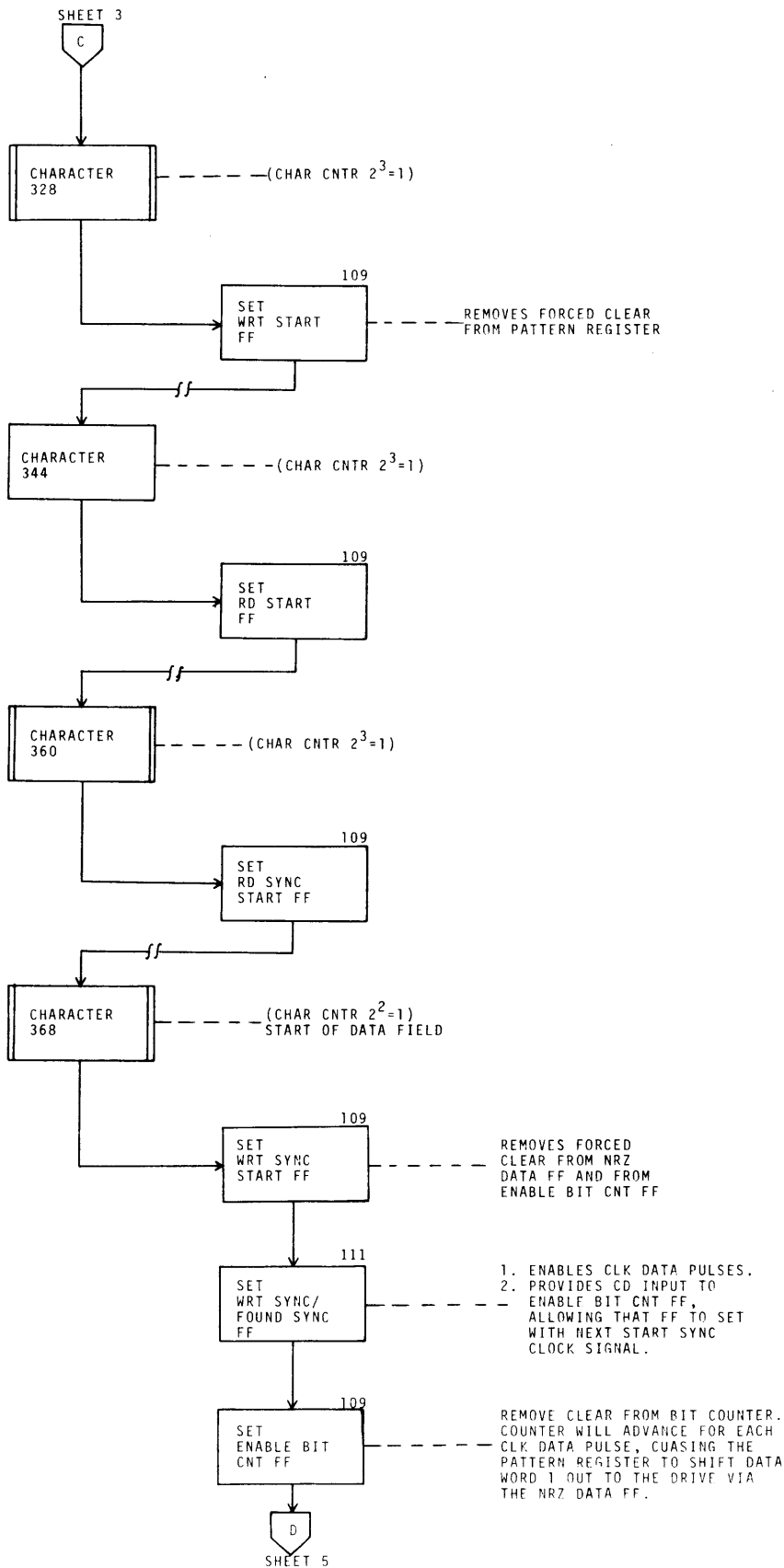


Figure 3-9. Write Format Flowchart (Sheet 4 of 5)

8U425-4

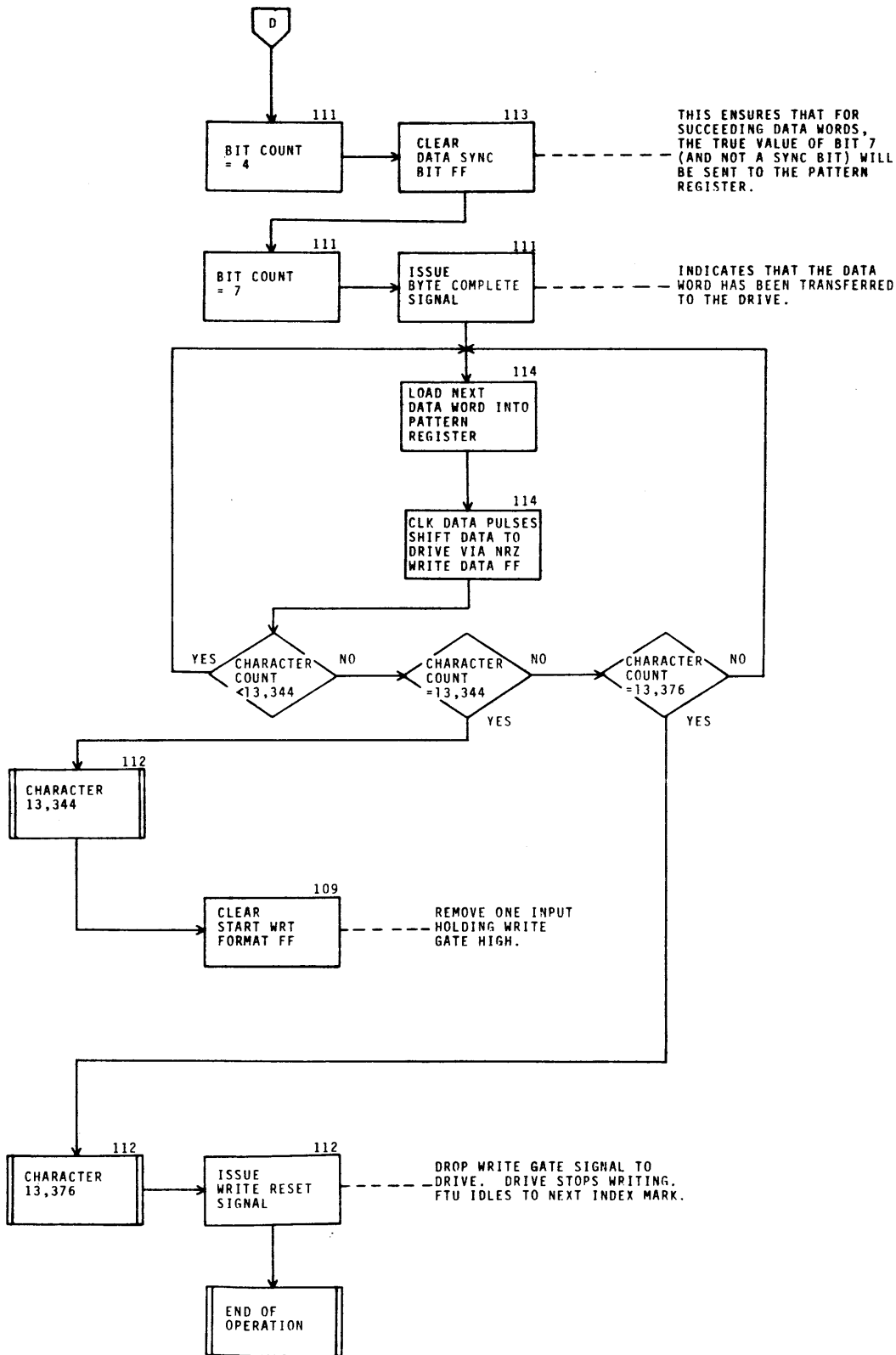


Figure 3-9. Write Format Flowchart (Sheet 5 of 5)

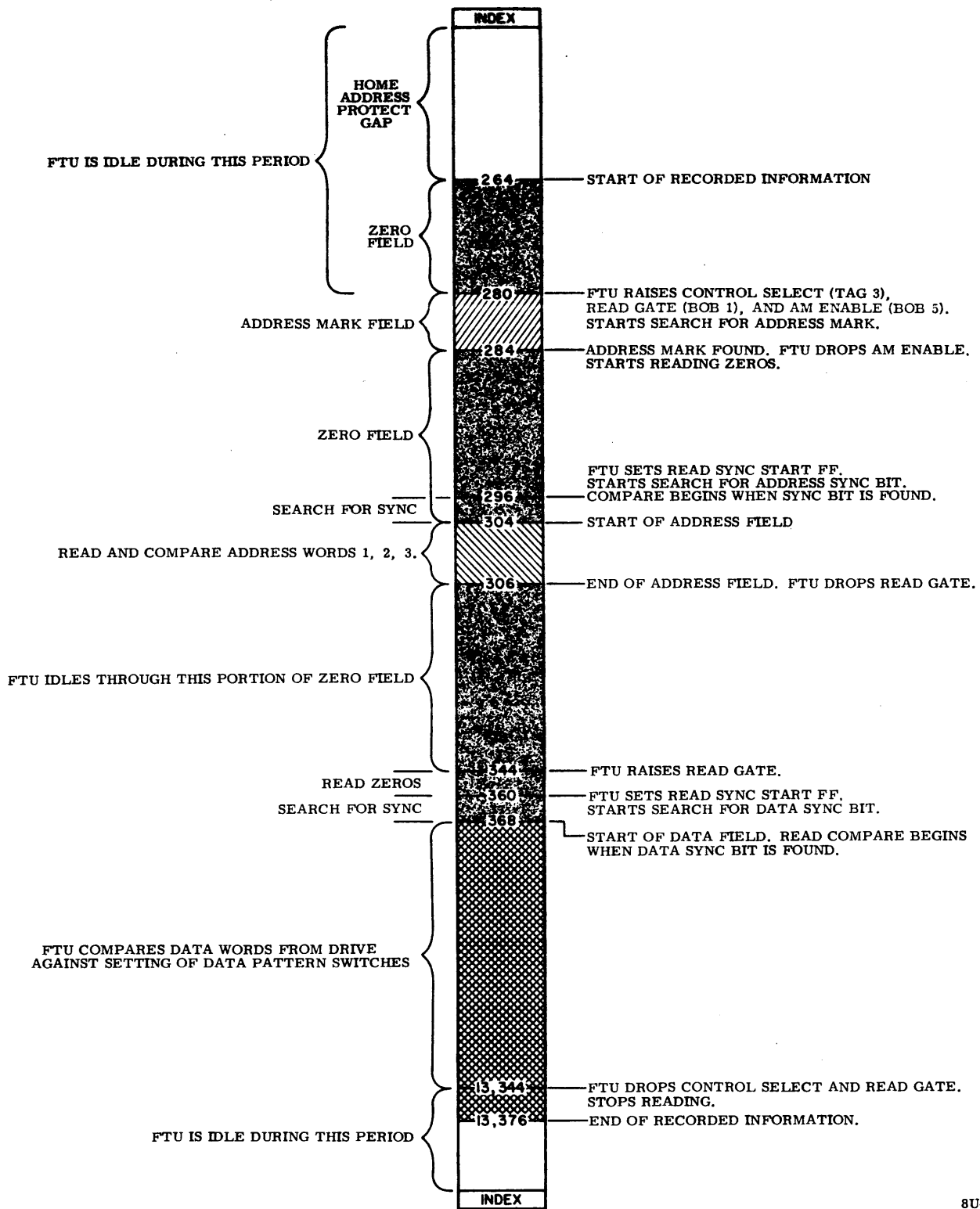
8U425-5

READ SEQUENCE

The Read sequence brings up the Read Gate twice. Once to read the address field and again to read the data field. Although the zero field following Address Mark is "read" by the FTU, the bits cannot be shifted in the Pattern register because the Clk Data pulses do not start until the Address Sync bit is found (at Character time 304). Figure 3-10 shows where the FTU "idles" through

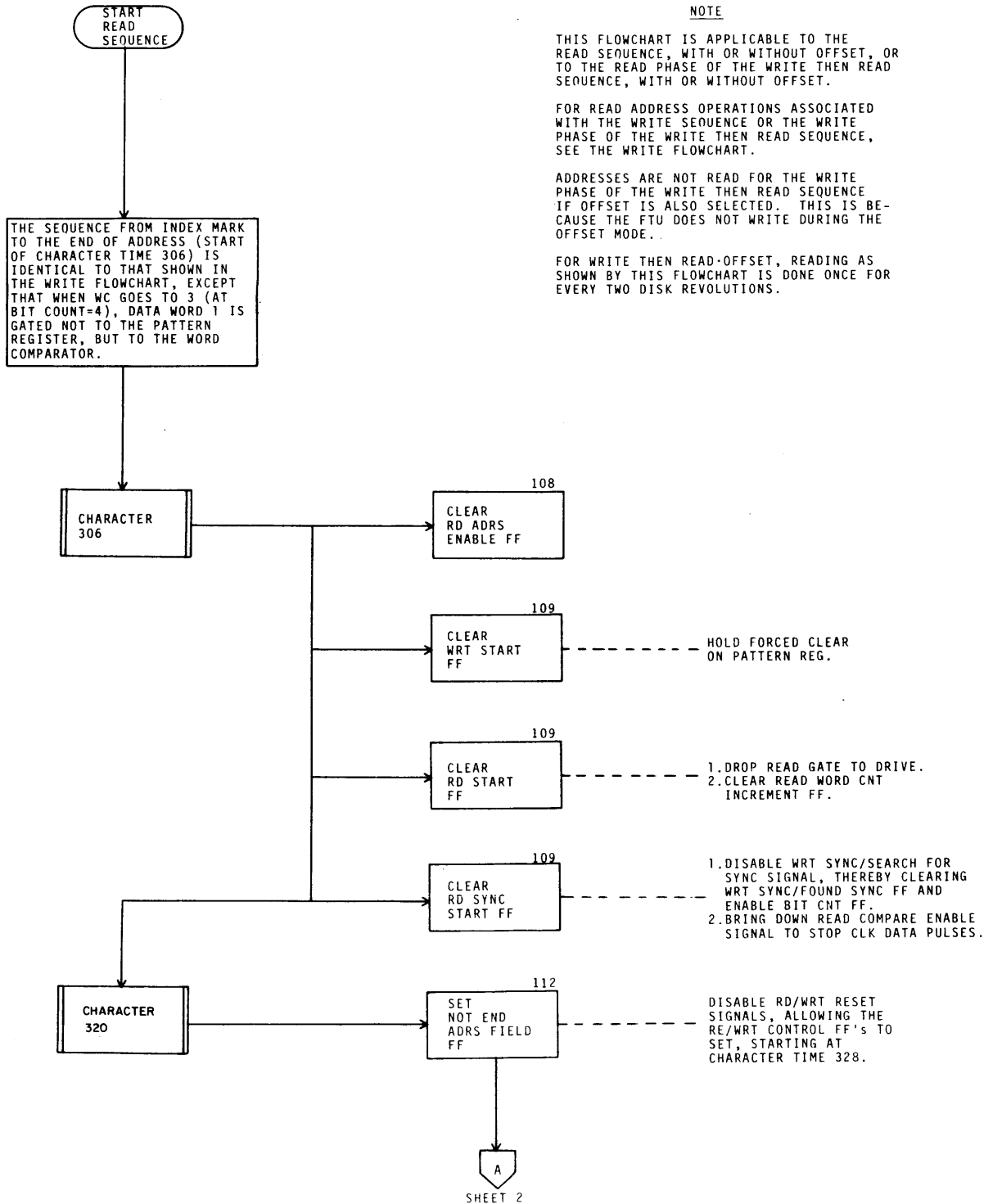
the first portion of the zero field that follows the address field.

When checking for the data sync bit, Read Gate is raised early enough to allow for any minor variation in disk speed -- that is, 16 counts before the sync bit is supposed to appear (roughly 20 μ sec). By the same token, Read Gate is dropped 32 counts before the end of the data field.



8U438

Figure 3-10. Read Track Pattern



NOTE

THIS FLOWCHART IS APPLICABLE TO THE READ SEQUENCE, WITH OR WITHOUT OFFSET, OR TO THE READ PHASE OF THE WRITE THEN READ SEQUENCE, WITH OR WITHOUT OFFSET.

FOR READ ADDRESS OPERATIONS ASSOCIATED WITH THE WRITE SEQUENCE OR THE WRITE PHASE OF THE WRITE THEN READ SEQUENCE, SEE THE WRITE FLOWCHART.

ADDRESSES ARE NOT READ FOR THE WRITE PHASE OF THE WRITE THEN READ SEQUENCE IF OFFSET IS ALSO SELECTED. THIS IS BECAUSE THE FTU DOES NOT WRITE DURING THE OFFSET MODE.

FOR WRITE THEN READ-OFFSET, READING AS SHOWN BY THIS FLOWCHART IS DONE ONCE FOR EVERY TWO DISK REVOLUTIONS.

Figure 3-11. Read Flowchart (Sheet 1 of 3)

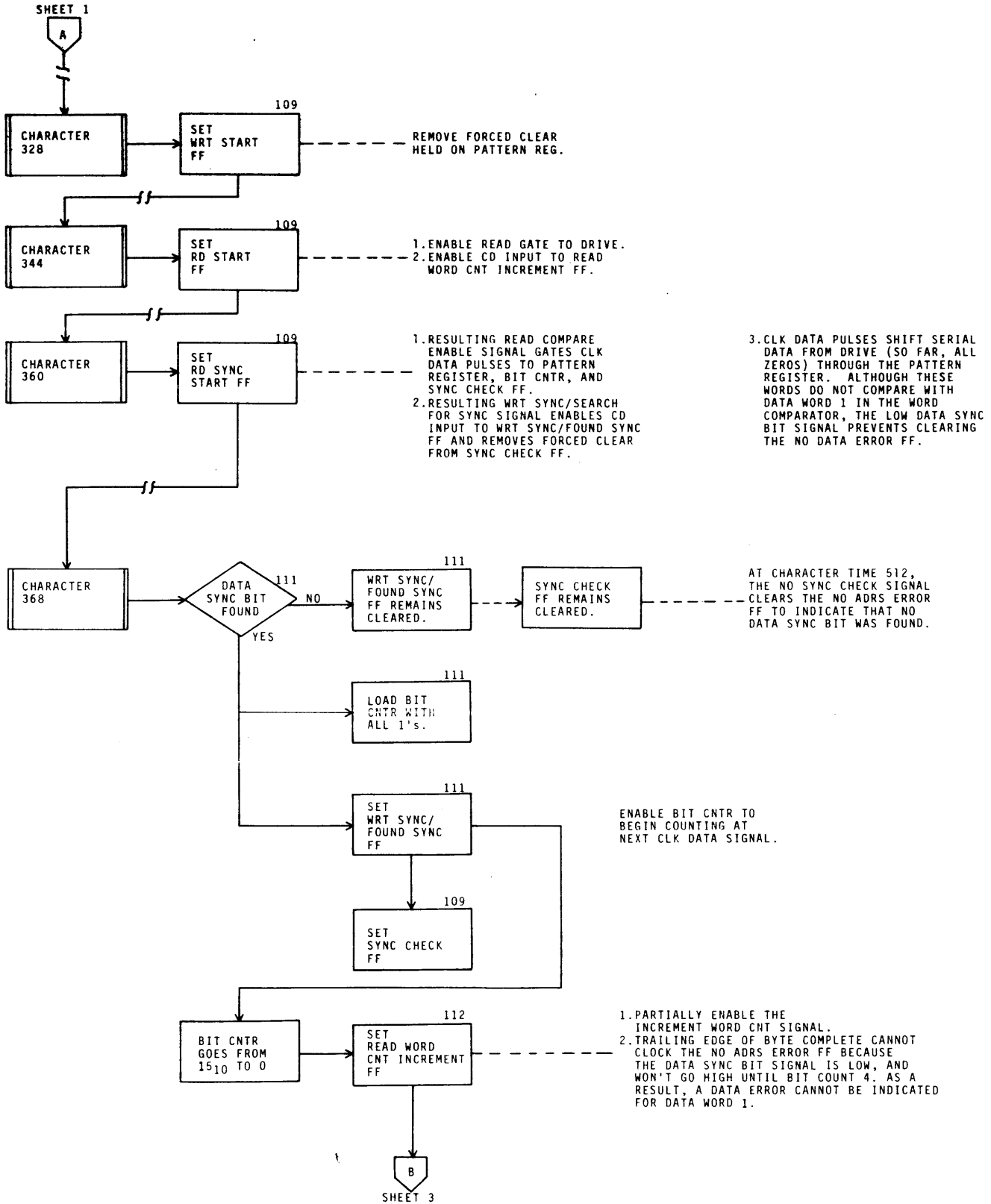


Figure 3-11. Read Flowchart (Sheet 2 of 3)

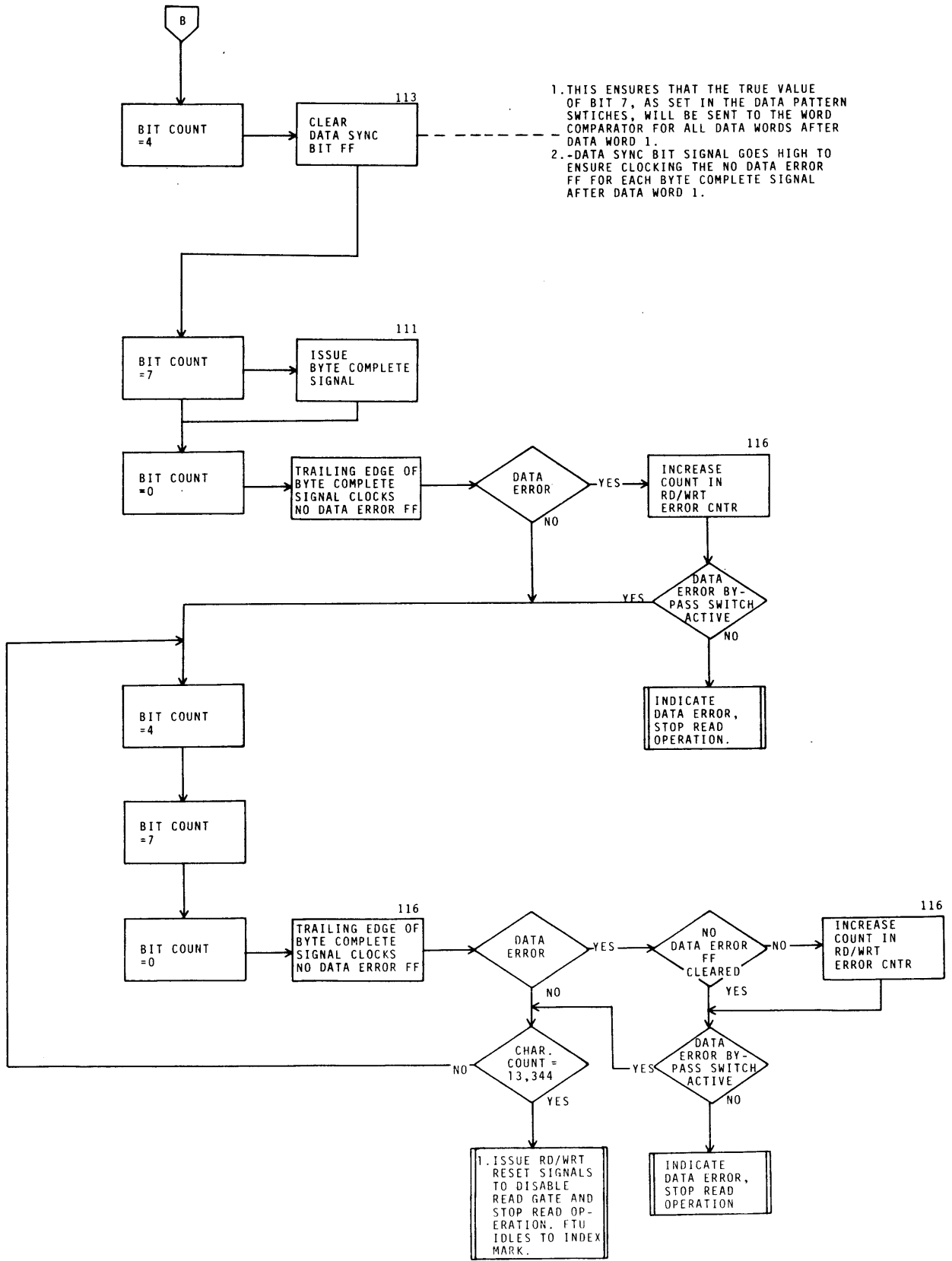
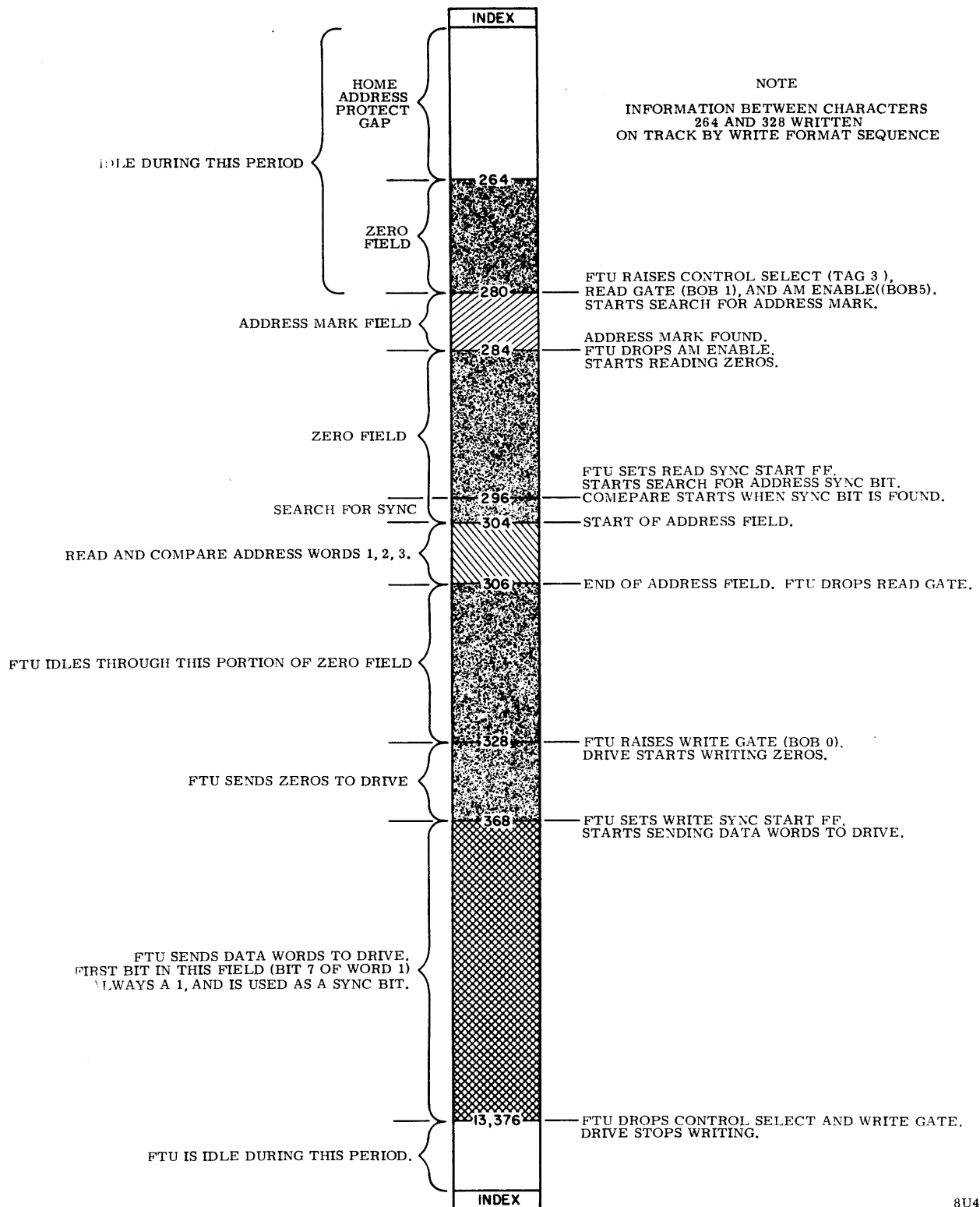


Figure 3-11. Read Flowchart (Sheet 3 of 3)

WRITE SEQUENCE

The Write sequence is identical to the Read sequence up to character time 328, at which point the FTU raises Write Gate and the drive

starts writing zeros. The data field is written as for Write Format. The Write track pattern and the Write Sequence flowchart are shown in figures 3-12 and 3-13, respectively.



8U439

Figure 3-12. Write Track Pattern

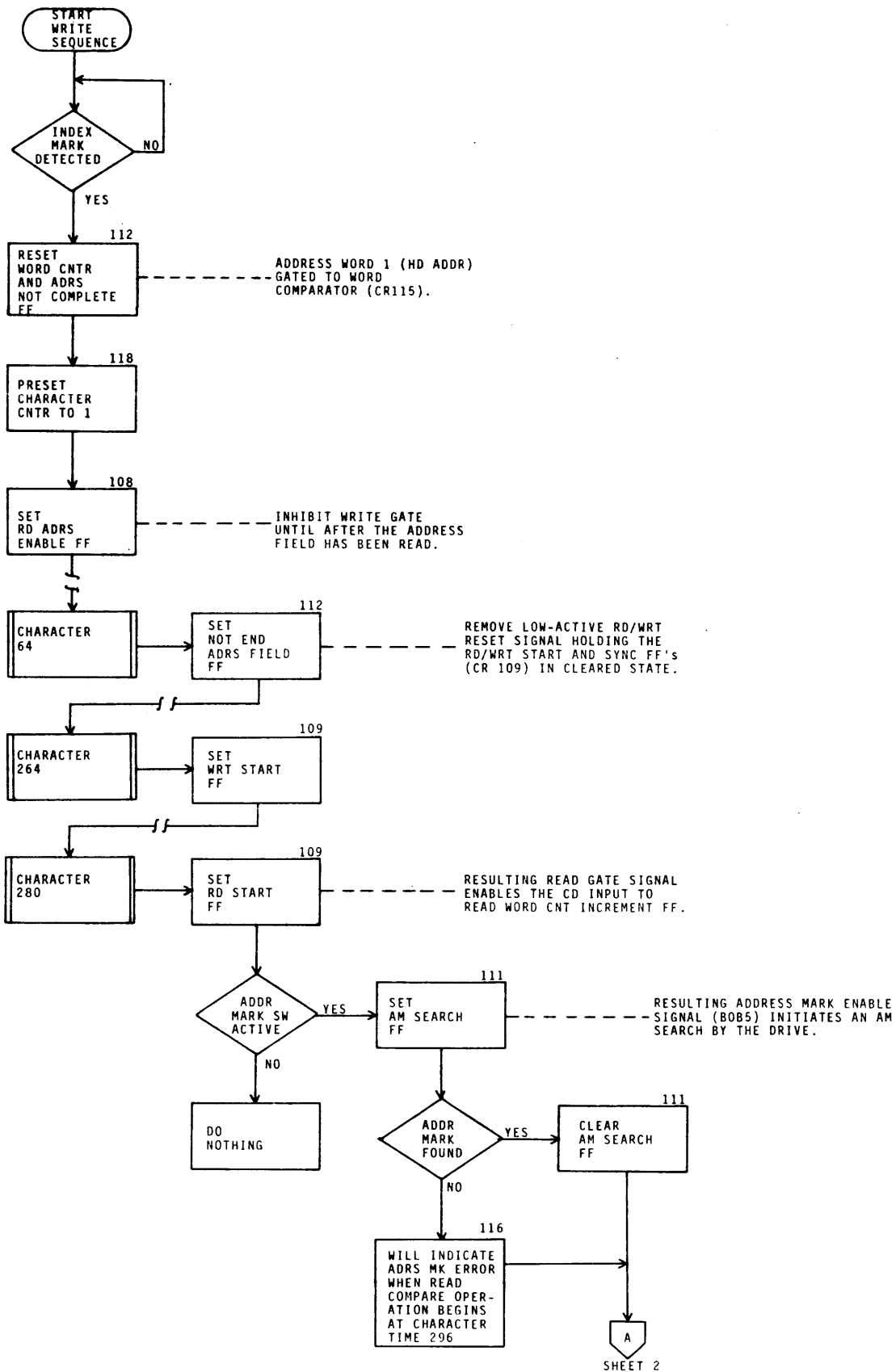


Figure 3-13. Write Flowchart (Sheet 1 of 5)

8U435-1

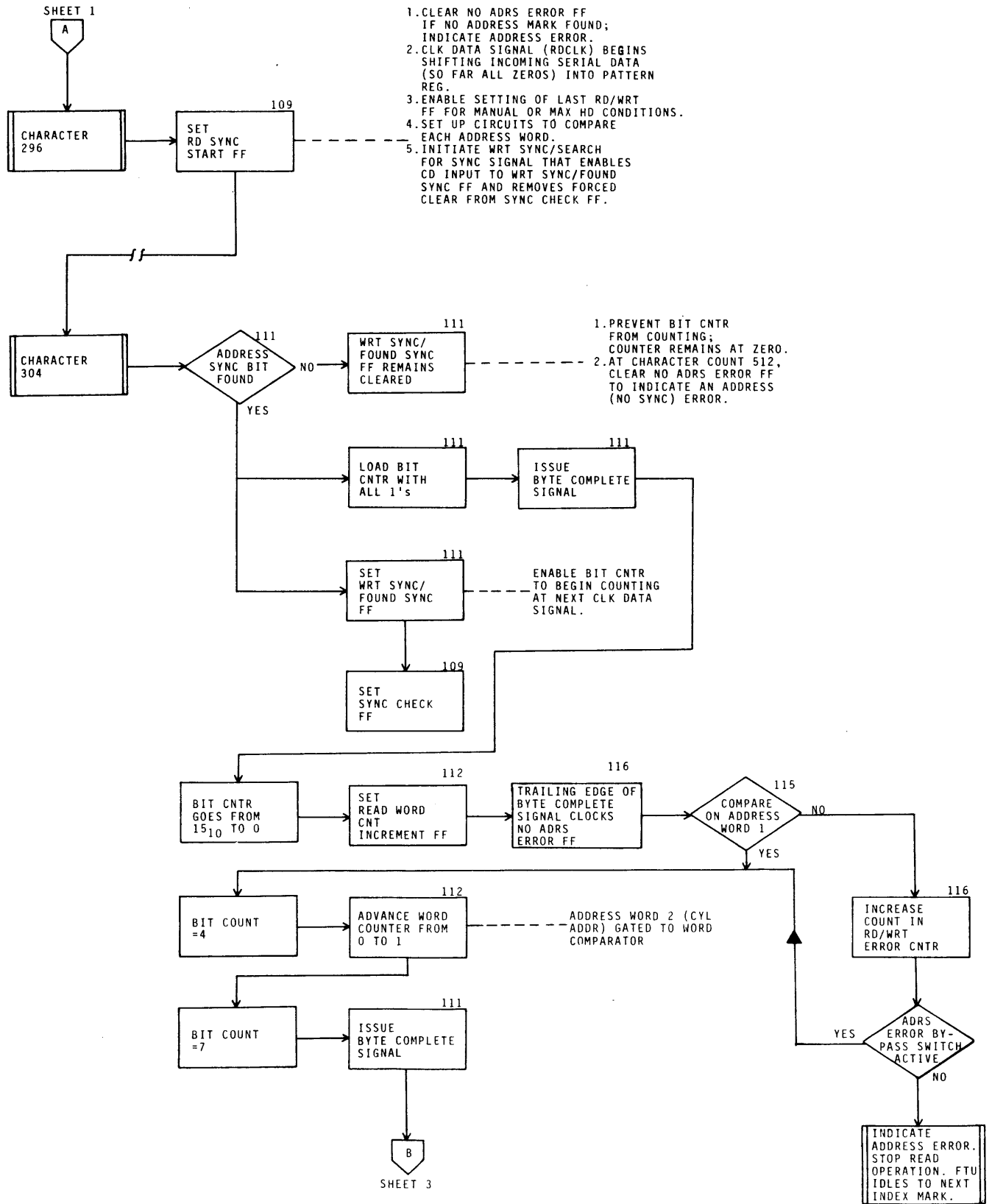
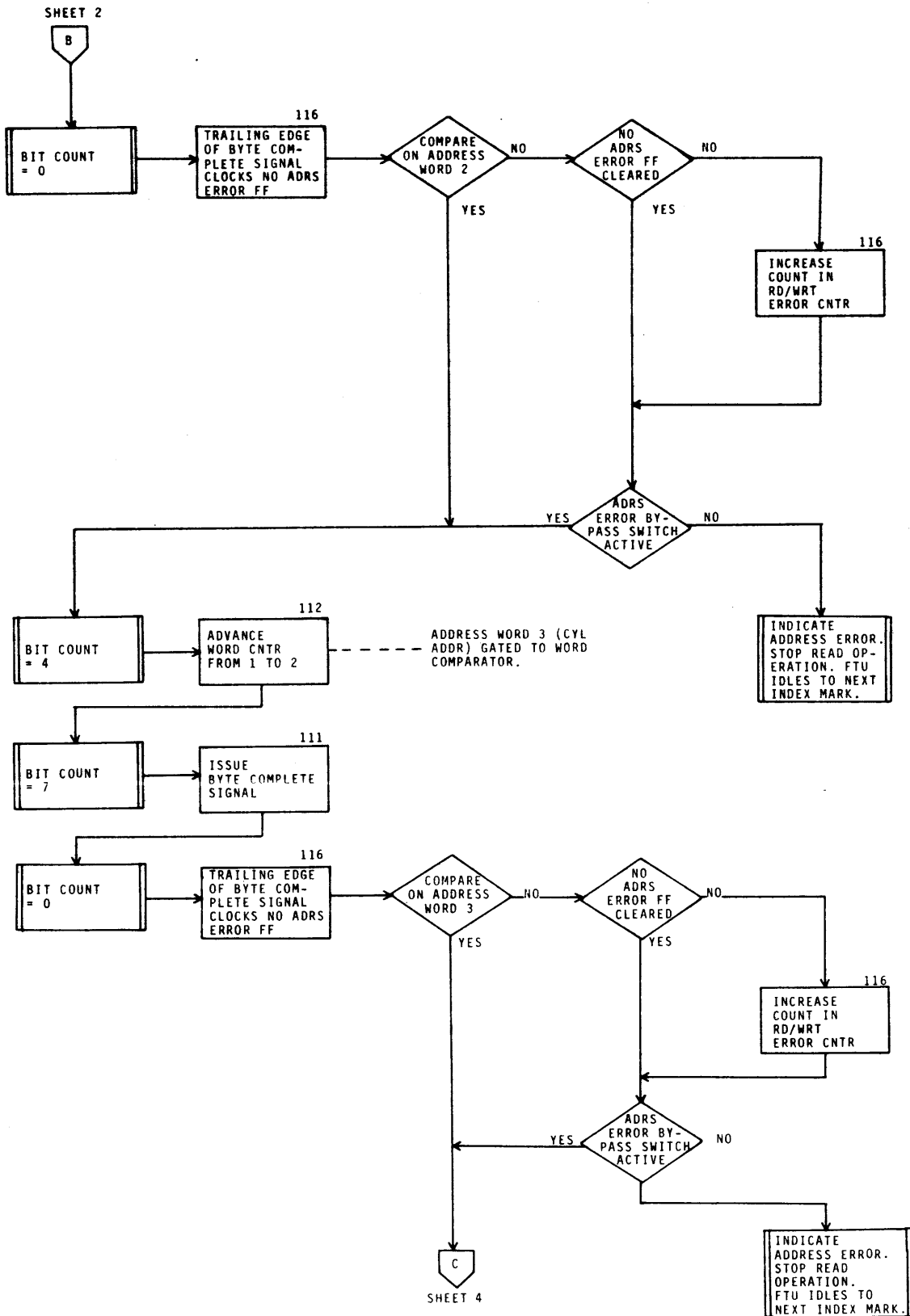


Figure 3-13. Write Flowchart (Sheet 2 of 5)



8U435-3

Figure 3-13. Write Flowchart (Sheet 3 of 5)

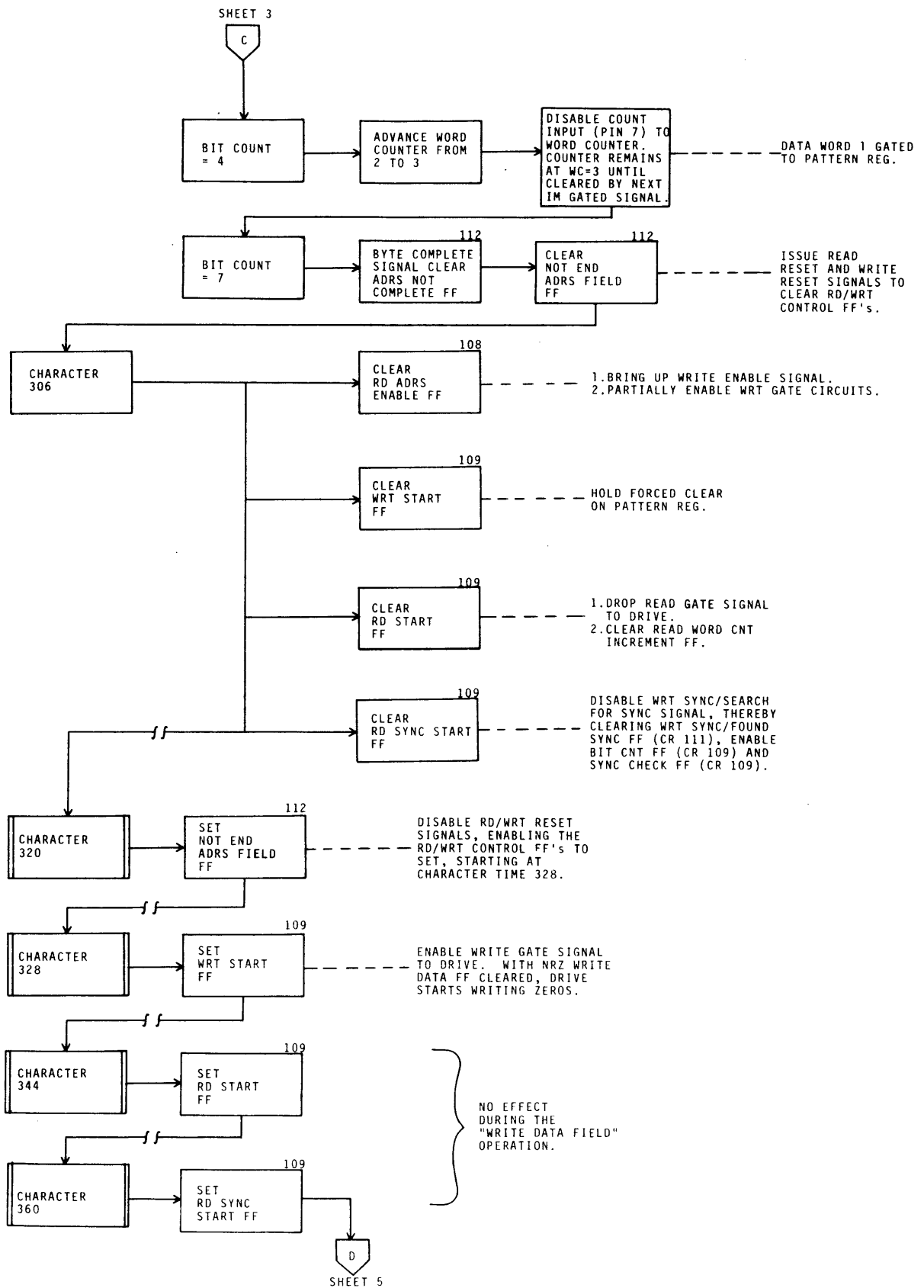


Figure 3-13. Write Flowchart (Sheet 4 of 5)

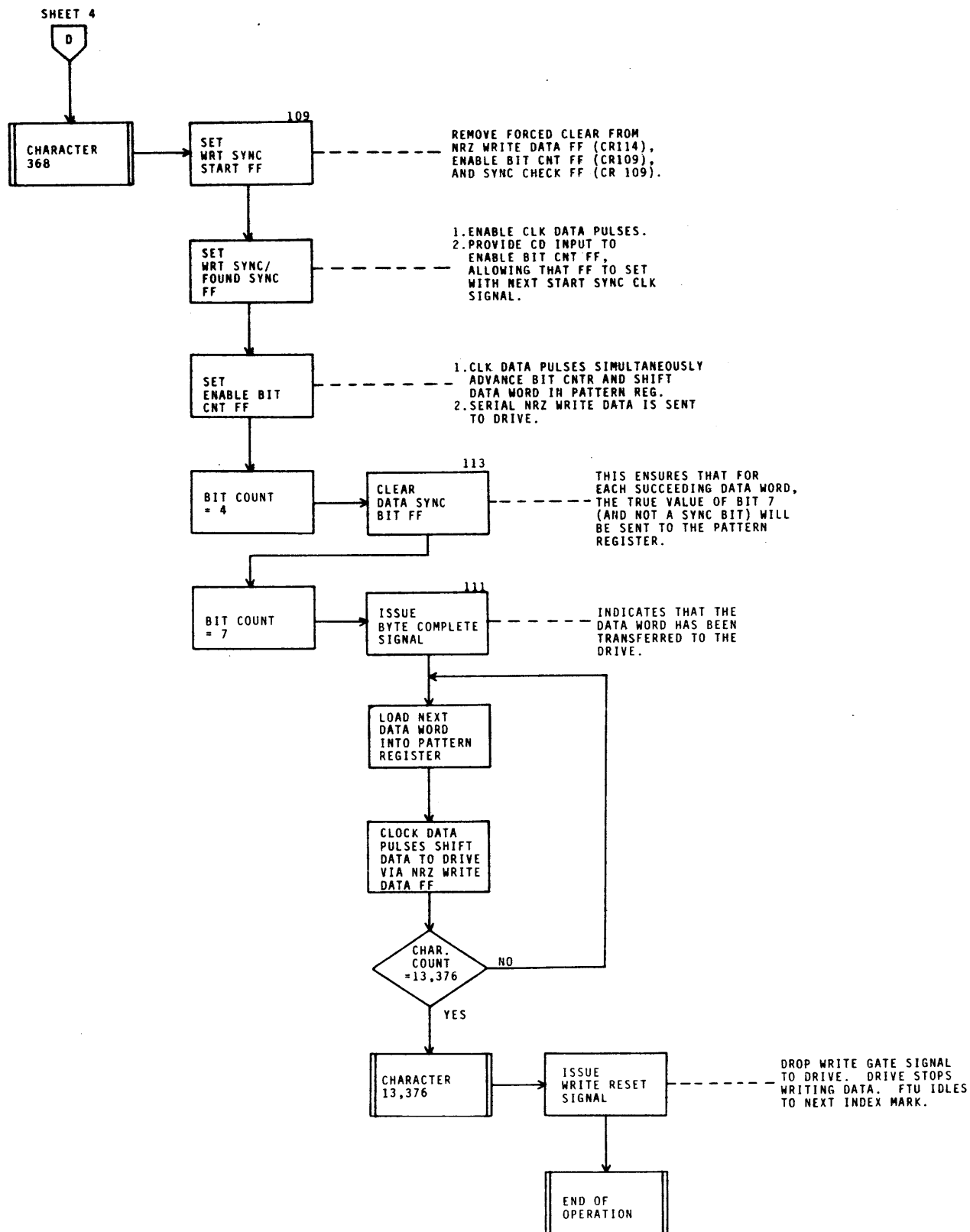


Figure 3-13. Write Flowchart (Sheet 5 of 5)

8U435-5

OFFSET MODE/DELAYED ON CYL

Figure 3-14 describes how the On Cylinder Detected signal is delayed by 4 ms during an Offset operation. The delay is necessary because the On Cylinder signal from the drive, once the drive has found the cylinder address, drops while the heads are moved to the offset position. When the offset move has been completed, On Cylinder comes up again to

retrigger the 4-ms delay. When the delay times out, the On Cyl Delayed FF is set, propagating the On Cyl Detected signal to the FTU logic.

The delay is also operative when the MAINTENANCE switch on the FTU Panel is active.

Writing cannot be performed during the Offset mode.

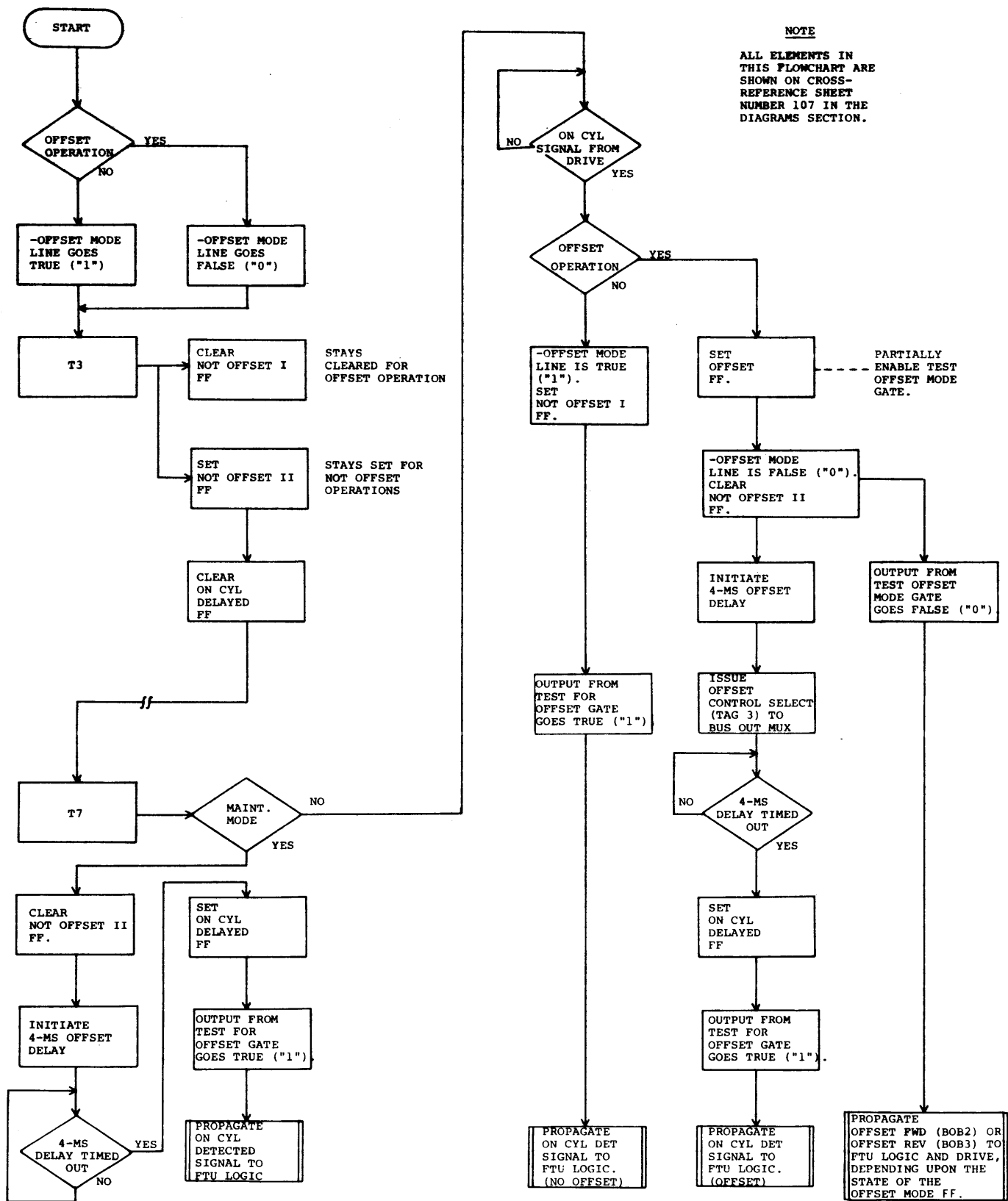


Figure 3-14. Offset/Delayed On Cyl Flowchart

FTU ERROR LOGIC

Of the five error indications provided on the FTU control panel, SEEK ERROR (as well as FAULT indicator) is generated in the drive. The following pages describe the four error indications that are detected by the FTU logic.

ADDRESS ERROR/DATA ERROR LOGIC (CR 116)

If the FTU is in Maintenance mode, or if the I/O Bypass cable is connected, the address/data error logic is disabled. The FTU will not stop for these errors, nor will the error(s) be counted in the R/W Error Counter. In the Normal mode, the error logic is disabled by holding both the Address Error and Data Error FFs in a preset state.

A preset pulse to these FFs also occurs at Index Mark time if the corresponding Error Bypass switch is active. Under this Error Bypass condition, the FTU will not stop after an Address or Data error, but the error will be counted by the R/W Error counter. The presence of each error type is manifested by clearing the appropriate Error FF. Because the R/W Error counter is edge-triggered, contiguous errors (errors with no "valid" word between them) from either of the Error FFs will be counted as one error.

Address Errors

Address errors are of three kinds:

- a. Address Mark error
- b. Sync Check error
- c. Address Word error

Address Mark Error (CR 111)

When the Address Mark switch is active, the AM Search FF is set by Read Gate at character time 280. The FF is cleared when the address mark is found. If the FF is still set (no address mark found) when Read Compare Enable comes up at character time 296, the Address Mark Error signal clears the Address Error FF (CR116).

Sync Bit Error (CR 116)

The address field sync bit occurs at about character time 304. The Data field bit occurs at about character time 368. If either of these sync bits are missing (-Sync Check = "1"), the Address Error FF will be cleared.

Address Word Error (CR 116)

If one of the three address words does not compare, the + Compare line will go low, as

will the CD input to the Address Error FF. Because the FF is clocked by the trailing edge of Byte Complete for address words 1, 2 and 3 (-Word Count 3), the FF will clear.

It may be of interest to note that the + Compare line is held high until character time 304 (address), and again between the end of the Address field and character time 296, at which point the Bit Counter starts counting Data bytes. Thus, + Compare ensures that the FF will be initially set at the start of both the Address and Data fields, so as to be ready for the sync bit that begins each of those fields (as well as for any errors that might occur in the address field itself).

Data Errors

Data errors consist of Read Clock errors and Data Word errors.

Read Clock Error (CR 116)

Normally, Read Clock pulses will continually retrigger the Missing Read Clock one-shot. If, when Read Compare Enable comes up for the Address or Data fields, a clock pulse is missing, the one-shot will time out, thereby setting the Read Clock Error FF. This, in turn, clears the Data Error FF.

Data Word Error (CR 116)

The Data Error FF is set prior to the start of the Data field by the high held on the + Compare line. (The logic for Compare is shown on CR117.) The -Data Sync Bit line is high after the Address field, so the Data Error FF is clocked by Byte Complete, starting at character time 296. When the hold on + Compare goes away at character time 368, the compare sequence begins. A Compare error is registered by clearing the Data Error FF at the trailing edge of Byte Complete. The next valid compare will again set the FF. As described above, contiguous bytes in error are counted as one error.

SERVO CLOCK ERROR LOGIC (CR 116)

A Ready signal accompanying the Start Access pulse sets the Enable Servo Clock Error FF (CR117). If a period of 200 nsec occurs without an FTU Write Clock pulse, the Servo Clock Error FF is set. The condition can be cleared only by actuating RESET. The FTU Write Clock may be either servo clock pulses from the disk, or pulses from the crystal oscillator in the FTU itself, depending upon the position of the MAINT/NRM switch on the FTU.

SECTOR MARK ERROR LOGIC (CR 117)

The Sector Mark (SM) Error FF is held in a precleared state by one of the following:

1. Enable Sector Mark Error signal = 0 (see CR 116 for conditions).
2. The normally cleared state of the Enable Servo Clock Error FF.

If case 1 exists, SM errors are not detected. The case to consider, then, is that in which the preclear on the SM Error FF is released by the presence of a Ready signal at Start Access time.

Normal Sequence

Index Mark (IM) sets the Load Sector FF, imposing a Load condition on the Sector counter by bringing pin 9 of that IC low. The Sector Counter is actually loaded by the trailing edge of the IM. The leading edge of the first SM after Index clears Load Sector, allowing the counter to be advanced by the trailing edge of that (and each succeeding) SM. The next IM finds the sector count at maximum, which results in presetting the Test Sector FF. The trailing edge of that IM, of course, reloads the Sector Counter. The ensuing SM (leading edge) clears Load Sector, while its trailing edge advances the count and clears Test Sector.

Abnormal Sequence

A Sector Mark Error can occur for two situations:

- a. Index Mark appears before the Sector Counter has reached its maximum count.
- b. A sector mark appears when the Sector Counter is already at maximum.

Situation 'a' will occur if a sector mark is missing (or has not been read). Situation 'b' will occur if there are more sector marks per disk revolution than are indicated by the setting of the Sector Mark switches, or if an IM pulse is missing.

Situation 'a'

The first sector mark after Index clears the Test Sector FF as usual, providing a logical 1 at the CD input to the SM Error FF. The next Index presets the Load Sector FF, as usual. The following sector mark then clears Load Sector (as usual), providing a positive-going trigger pulse that now combines with the CD input to set the SM Error FF.

Situation 'b'

A sector mark that appears when the Sector Counter is already at maximum presets the SM Error FF.

The setting of the SM Error FF for either of the situations above ensures that the Load Sector FF will be set by the leading edge of the next sector mark. This holds the Sector Counter in a Load state, which prevents the counter from advancing. The circuit is returned to normal by clearing the SM Error FF. This occurs at Index Mark time if the Address Error Bypass switch is active, or when the RESET switch is actuated. Either case forces the + Enable Sector Mark Error signal low.

UNIT SELECT/RELEASE LOGIC

The contents of Unit switches 8,4,2,1 is available in two places in the A cable: on Bus Out lines 0-3 (CR 120), and on Unit lines 2⁰-2³ (CR 124). In drives having the 60-pin A cable, the unit information is derived from the Unit lines. For 50-pin I/O drives, the Unit lines are not present, so the information must be obtained from the Bus Out lines. In either case, the Unit Select Tag (CR 124) is sent separately -- that is, not across the Bus Out lines.

With the UNIT SEL/REL switch in neutral, a forced clear is imposed on the Unit Select FF (CR 122). When the switch is raised to the SEL position, the clear is removed and a 5-ms pulse generated that sets the FF, causing the Unit Select Tag to be sent to the drive (CR124). At the same time, the pulse causes a 5-ms Unit Bus signal that selects input 3 of the Bus Out Mux (CR120), thereby gating the contents of the four UNIT switches to the Bus Out lines. (Unit lines 2⁰-2³ are static, whereas Bus Out Bits 0-3 are seen as a 5-ms pulse.)

Returning the switch to neutral drops the Unit Select Tag.

The momentary REL (Release) position of the switch is for use only in dual-access drives. Issuing the 5-ms Unit Select Tag is accomplished as described above. After another 5 milliseconds, the Release delay (CR102) times out. This causes input 2 of the Bus Out Mux to be selected (CR 120), sending the Release signal to the drive along with Tag 3. Returning the switch to neutral (center-off) drops the Tag 3 indication.

FIXED HEAD OPERATION

Three switch combinations can affect the Sel Fixed Hd FF (CR 105):

1. If FIXED • () is the combination selected, the FF is preset to select only fixed heads (numbered 0-47).
2. If either MOVABLE or SMD positions are selected, the FF is force-cleared; in effect, it doesn't exist.
3. If BOTH is selected from the FTU panel, the FF will toggle with each +Clr Cyl signal issued by the CAR logic (CR 104).

Let's examine these situations in order.

PRESET -- EXERCISE FIXED HEADS ONLY

Inputs to the Hd Adrs Comparator (CR 106) will allow a maximum head address of 3. The +Sel Fixed Hd signal (CR 105) enables the +CAR 512 and +CAR 256 lines from the display mux (CR 119) to the drive, informing it to select one of 48 fixed heads, depending upon the lower two bits of HAR and the lower four bits of CAR (in the FTU).

With HAR and CAR initially cleared, fixed head 0 is selected, followed by 1, 2, and 3 as HAR advances to maximum. CAR is now advanced, HAR is cleared, and the next cycling of HAR selects fixed heads 4, 5, 6, and 7. This sequence is repeated until CAR reaches 12, whereupon a 0.475 μ s +Clr Cyl pulse clears CAR (CR 104) and the entire procedure begins again.

FORCED CLEAR -- EXERCISE MOVABLE HEADS ONLY

Action is as shown in the R/W mode flowcharts. The fixed heads are not exercised in this situation.

TOGGLE -- ALTERNATELY EXERCISE MOVABLE AND FIXED HEADS

Assume that the Sel Fixed Hd FF is initially cleared, along with CAR and HAR. All movable heads are first exercised through all access positions (as determined by the access mode), starting with cylinder 0, head 0. After maximum cylinder is reached, the +Clr Cyl pulse clears CAR and toggle-sets the Sel Fixed Hd FF.

All 48 fixed heads are now exercised as described above until, when CAR reaches 12, a low-active -Clr Cyl signal (CR 104) initiates the +Clr Cyl pulse (CR 105) to clear CAR and toggle-clear the Sel Fixed Hd FF. At this point, the pattern for exercising the movable heads is again entered, and the entire sequence starts anew.

HEAD ALIGNMENT CARD (HFSV)*

The Head Alignment circuit receives the positive and negative dibit information from the Servo or Read/Write heads and processes the information to produce the offset indications. Two types of offset indications are produced: the visual indication available on the head alignment meter, and the sign information that is used by the controller during the automatic head alignment procedure. The meter reading is a halved indication of head offset expressed in microinches. Total offset is the sum of the absolute value given for both positions of the POS/NEG switch. The sign information is a changing polarity signal produced each time the FTU meter passes through zero.

The alignment card receives dibit information from either the Servo head or one of the Read/write heads depending on the position of the R/W-SERVO switch.

The received dibit information is amplified and gain scheduled such that the total of the positive and negative signal is maintained at 500 mV. A normal On Cylinder signal would contain 250 mV of positive dibit information and 250 mV of negative dibit information. If the negative dibit information decreases to 150 mV the automatic gain control circuit causes the positive dibit information to increase to 350 mV. This results in the combined output being maintained at 500 mV.

Non-AGCed Servo and Read/Write head information is fed through switching circuits and applied to the input of a minimum level detector circuit. Because the read/write head information has a lower signal level, it is gated through an additional gain stage before it is applied to the level detector. As long as the signal level is of sufficient amplitude, the output of the level detector retriggers a one-shot circuit. The time constant of the one-shot is selected so that the circuit will not time out unless the output of the level detector fails to retrigger it.

The output of the minimum level detector's one-shot is used to gate on the midpoint detector circuit. The AGCed positive and negative dibit signals are biased above and below the zero threshold. When the two out of phase signals reached the zero point simultaneously, they turn on the midpoint detector. The output of the midpoint detector drives two one-shot circuits. The one-shots are retriggered by the second midpoint pulse before they time out. The time out of the one-shots is the Read Gate for the Peak Detector circuits.

* TB304A/B only

The Peak Detector circuit alternately detects the positive and negative dibit peak amplitudes. These peaks are used to charge up two capacitors. The difference in potential between the two capacitors represents the

amount and the direction of the head offset. The two capacitors drive a differential amplifier. The amplifier output is then scaled and limited and used to drive the head alignment meter.

SECTION 4

MAINTENANCE

POWER SUPPLY VOLTAGE CHECKS

Two 5 V power supplies provide overvoltage protection that drops the output voltages to about 1 volt if the supply voltage should exceed approximately 6.5 volts. The exact point at which the drop in output occurs is preset at the factory with no load on the supply. In addition, each supply has a Voltage Adjust pot to set the full-load output voltage to 5 V, ± 0.5 V. The location of these four potentiometers is shown in CR500 of the Diagrams section.

Holes in the front wall of the power supply compartment allow access for screwdriver adjustment of the two +5 V pots. The -5 V pots may be adjusted by using the finger tips to turn the blue plastic disk attached to the shaft of each potentiometer.

NOTE

Don't capriciously tweak the factory-set Overvoltage pots. Not only can the overvoltage protection be lost if the shaft is turned one way, but also, if the shaft is rotated the other way, premature protection may be invoked that will cause the output to drop off before the supply reaches its operating voltage. The Overvoltage Adjustment procedure given below is for those relatively rare occasions where the procedure is absolutely necessary.

OVERVOLTAGE ADJUSTMENT PROCEDURE

1. Turn off the FTU and remove the cover from the power supply compartment.
2. Disconnect the red (+5 V) wires going to the logic board and control panel from ALTBl-8. Do not disconnect the red wire coming from the +5 V.
3. Turn the +5 V Overvoltage pot fully counter clockwise (to raise the overvoltage sense beyond the range of the +5 V supply, essentially negating any regulatory actions.)
4. Turn the +5 V Voltage Adjust pot fully counter-clockwise to minimize the output voltage.
5. Turn on the FTU.

6. Connect the ground probe of a VOM to a convenient ground in the FTU case.
7. Slip the other VOM probe under the screw of ALTBl-8; tighten the screw to hold the probe.
8. Observing the VOM, turn the +5 V Voltage Adjust pot until the meter registers +6.5 V.
9. Still observing the VOM, turn the Overvoltage pot slowly clockwise until the meter shows an abrupt drop from +6.5 V to about +1 volt.
10. Turn down the Voltage Adjust pot so the meter reads +5 V. (This reading will probably change when a load is later applied to the supply.)
11. Turn off the FTU, reconnect the red wires to ALTBl-8.

Repeat steps 2 through 11 for the -5 V supply if necessary, using the blue wires, ALTBl-7, and minus voltages.

NOTE

After performing the Overvoltage Adjustment, it is necessary to re-adjust the supply voltage under load, as shown in the Voltage Adjustment below.

VOLTAGE ADJUSTMENT PROCEDURE

1. Remove the cover to the power supply compartment, if this was not done as part of the Overvoltage Adjustment procedure.
2. Connect the ground probe of a VOM to the FTU ground stud or some other convenient logical ground; connect the other probe to ALTBl-8, for +5 V adjustment, or to ALTBl-7 for -5 V adjustment.
3. While observing the VOM, turn the Voltage Adjust potentiometer on the requisite supply until the meter reads 5 V, ± 0.5 V.
4. Repeat steps 2 and 3 for the other supply.
5. Replace the cover to the power supply compartment.

TROUBLESHOOTING THE FTU LOGIC

GENERAL

When using the TB304 to troubleshoot problems in the drive, it would be reassuring to know that the tester is functioning properly; that is, that the drive is not adding FTU errors to the pattern it writes or reads on the scratch pack. That is why the Operation section stressed the need to perform repeatedly any exercise that caused error stops, in order to pin-point the drive, the scratch pack, the I/O cabling, or the FTU as the source of the problem.

The flowcharts in section 3 show the sequencing of signals and commands to most FF's and registers in the FTU for each access and R/W mode. The diagrams in section 5 are arranged functionally to minimize jumping from page to page while tracing a circuit. As a result, a break in the flow of a signal or command between two flowchart points may be easily related to the gates and inverters between those points. These elements will most always appear on one or the other of the diagrams denoted by the cross-reference numbers above the respective flowchart symbols.

Remember that with the Maintenance/Normal switch in MAINT, all lines from the drive are active with the exception of Read Clock, Read Data, and Unit Ready (which is artificially generated in Maintenance mode), and that the write functions are not impeded. The above statement assumes, of course, that the A and B cables are connected to the drive.

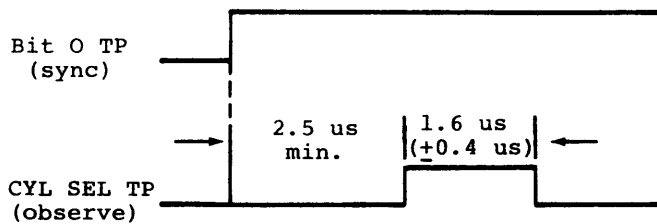
USING THE TEST POINTS

The stylized waveforms below should help in determining whether or not the FTU is performing properly. Not all test points on the panel are shown, but the method of operation may be extended to those not included.

Cylinder Select

Access Mode CONT
Cyl Addr Sw Bit 1 ON (up), others OFF

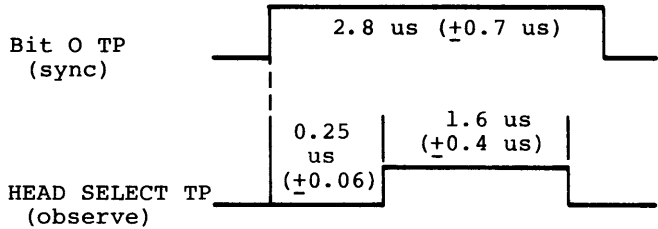
Actuate RTZ, then START. Drive alternates between cylinders 0 and 1.



Head Select

Access Mode DIRECT
Wrt-Rd Select WRT FORMAT
Seq/Man MAN
Head Addr Bit 1 ON (up), others OFF

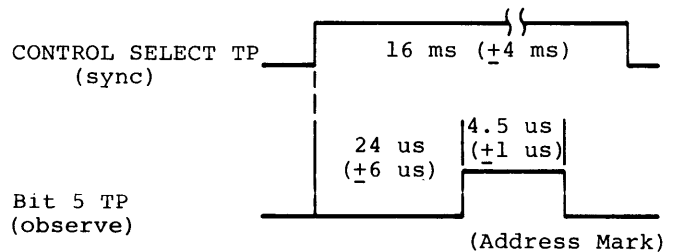
Actuate START.



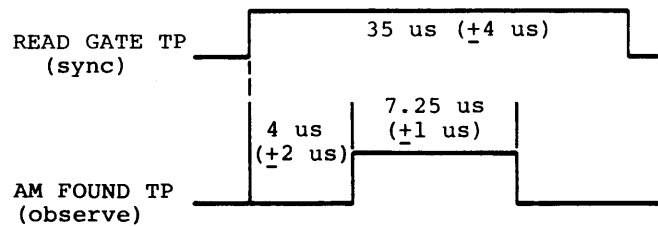
Address Mark

Access Mode DIRECT
Wrt-Rd Select WRT FORMAT
Seq/Man MAN
Addr Mk/Sector Mk ADDR MK

Actuate START.



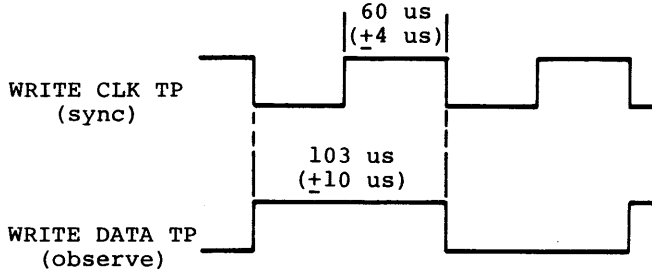
Actuate STOP. Place Wrt-Rd Select switch to WRT. Actuate START.



Write Clock/Data

Access Mode DIRECT
 Wrt-Rd Select WRT
 Data Pattern Sw 10 101 010 pattern

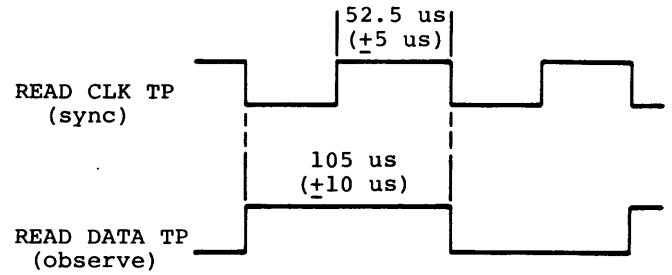
Actuate START.



Read Clock/Data

Access Mode DIRECT
 Wrt-Rd Select READ
 Data Pattern Sw (as for Write Clock/
 Data, above)

Actuate START.



Read Gate/Write Gate

The Read Gate and Write Gate test points offer a rough index of the FTU's operation. When syncing on Index Mark, the R/W gate TP's should not deviate by more than 10% from the norms shown in figure 3-7.

SECTION 5

DIAGRAMS

This section contains the logic, cabling, and power diagrams for the TB304B/C and the TB304A. Yellow divider sheets identify the two diagram sets. The cross-reference numbers described below are duplicated for each set, except as indicated.

Cross-reference numbers for the diagrams fall into seven number series, as shown below. The first sheet in a series is usually a "locator" diagram that shows the physical arrangement of the electrical components within that series. A map of the logic board (IC placement) is given on CR sheet 125.

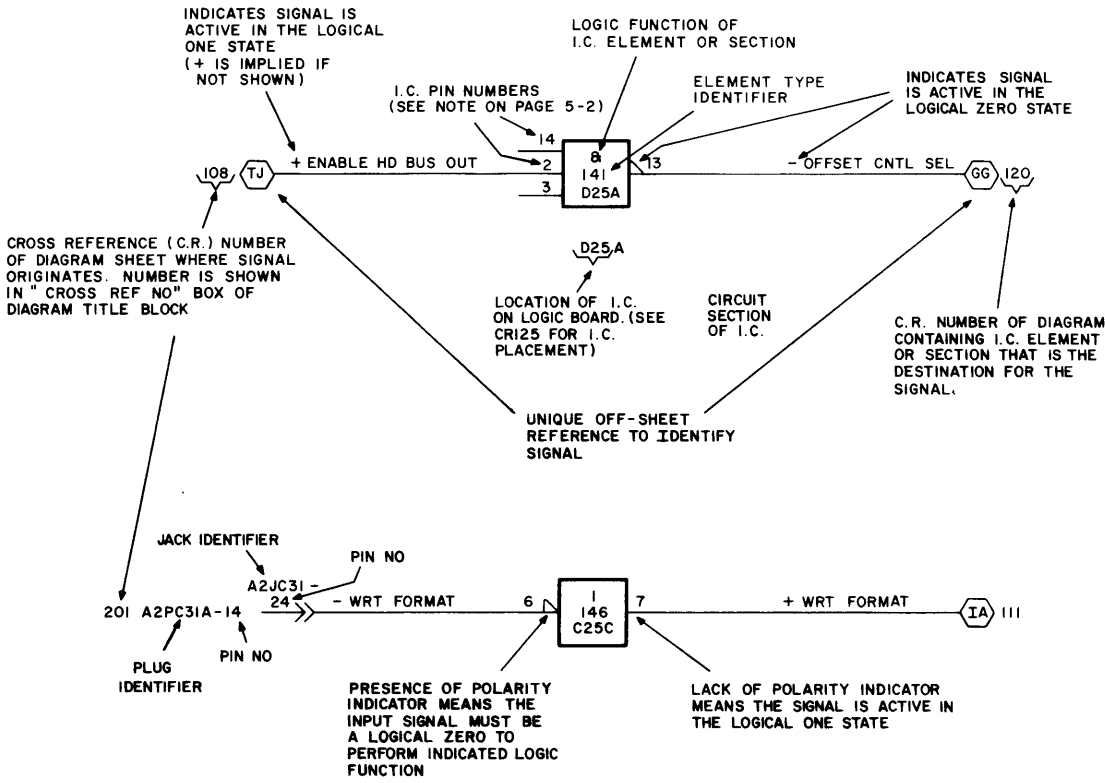
| <u>CR Series</u> | <u>Is Concerned With</u> |
|------------------|-----------------------------------------|
| 010 ① | Key to Logic |
| 100 | Logic Diagrams |
| 200 | Logic Board/Control Panel Cabling |
| 300 | Panel Switches, Indicators, Test Points |
| 400 | I/O Cables |
| 500 ② | Power Supply |
| 600 ② | Type HFSV Head Alignment Card |

① Found in front of TB304B/C divider, this series is common to both diagram sets.

② Shown only with the TB304B/C diagram set, but applicable to the TB304A as well.

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ABBREVIATIONS USED ON LOGIC DIAGRAMS

| | | | |
|--------|---------------------------|---------|------------------------|
| ADRS | ADDRESS | MK | MARK |
| ALTN | ALTERNATE | MUX | MULTIPLEXER / SELECTOR |
| CHAR | CHARACTER | RAND | RANDOM |
| CLK | CLOCK | RD | READ |
| CNT(R) | COUNT (COUNTER) | REL DLY | RELEASE DELAY |
| CNTL | CONTROL | RTZ | RETURN TO ZERO |
| CONT | CONTINUOUS | SEL | SELECT |
| CYL | CYLINDER | SEQ | SEQUENTIAL |
| DIR | DIRECT | STR | STROBE |
| DSO | DIRECT SEEK ONLY | T1 | TIME 1 |
| HD | HEAD | ⋮ | ⋮ |
| INCR | INCREMENT (INCREASE BY 1) | T7 | TIME 7 |
| MAN | MANUAL | WRT | WRITE |

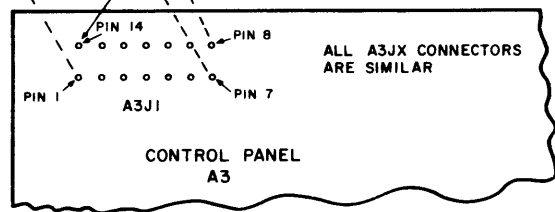
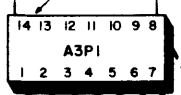
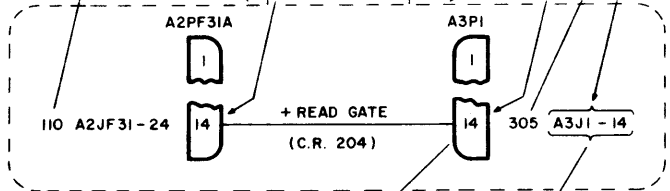
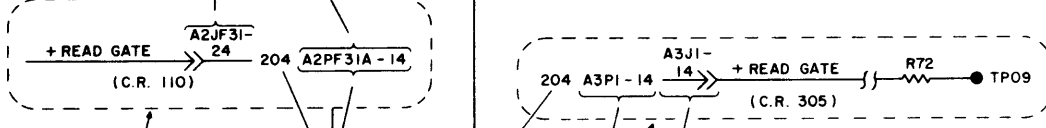
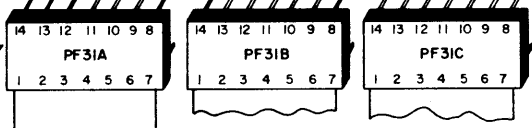
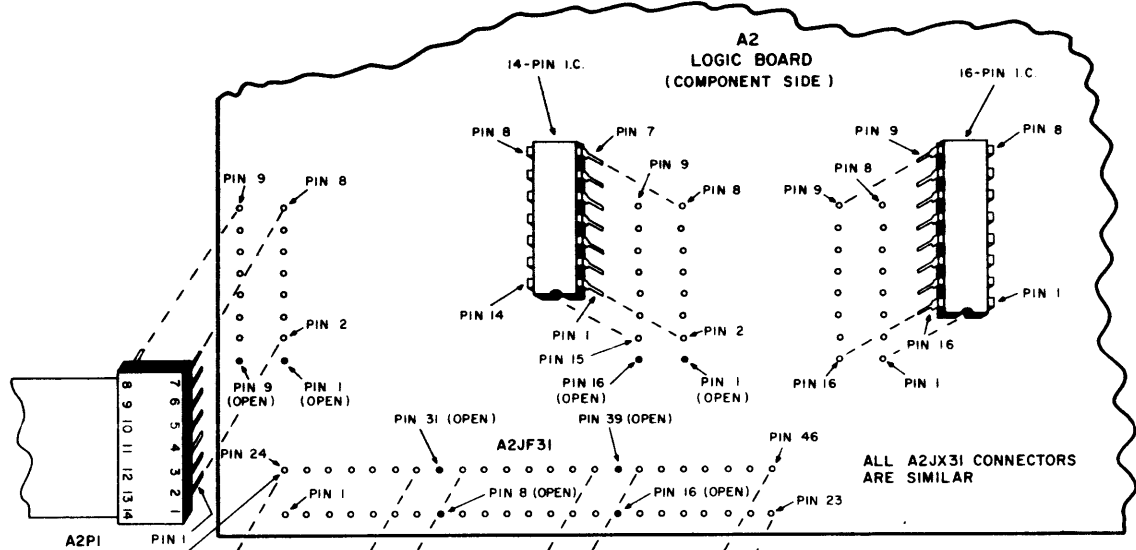
| | | | | |
|-----------------------------------------------|-------|---------------|------|-----|
| CODE IDENT | 19333 | 83319600 | A | A |
| CROSS REF NO | 010 | SHEET 1 of 45 | PAGE | 5-1 |
| KEY TO LOGIC SYMBOLS & LOGIC INTERCONNECTIONS | | | | |
| CONTROL DATA | | | | |
| NORMANVILLE DIVISION | | | | |

D C B A

TB304B/C

DIAGRAMS

D C B A



NOTES:

ALL I.C. SOCKETS ARE 16-PIN CONNECTORS.

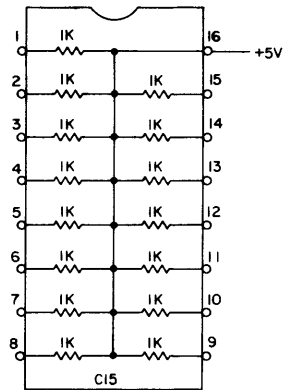
LOGIC-SYMBOL PIN NUMBERS SHOWN ON DIAGRAMS ARE THOSE FOR THE I.C. CONNECTOR, NOT THE I.C. ITSELF. BECAUSE PIN 1 IN THE CONNECTOR (AND ALSO PIN 16) IS NOT USED FOR 14-PIN I.C.S., THE ACTUAL I.C. PIN NUMBER (FOR 14-PIN I.C.S.) WILL BE ONE LESS THAN SHOWN. THIS IS IMPORTANT WHEN TROUBLESHOOTING I.C. PROBLEMS WITH THE LOGIC SCHEMATICS.

| | | | | | |
|----------------------|-----------------|--------------|----------|-----|------|
| CONTROL DATA | KEY TO LOGIC | 19333 | 83319600 | A | A |
| | FLAT - CABLE | | | | |
| NORMAN DALE DIVISION | PIN ARRANGEMENT | CROSS REF NO | SHEET | 2 | PAGE |
| | | 011 | 2 | 5-2 | |

D C B A

D I C B A

HEADER CHIP CONNECTORS

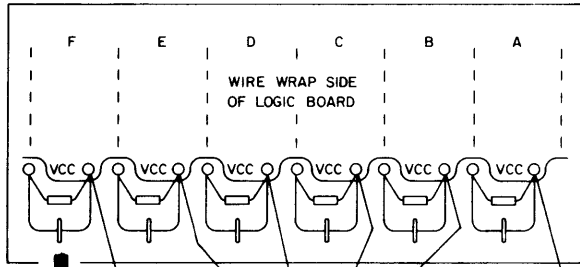


ALL 1K RESISTORS FOUND IN THESE DIAGRAMS ARE LOCATED ON THIS HEADER CHIP (UNLESS OTHERWISE SPECIFIED) WHICH 1K RESISTOR IS BEING REFERRED IS DETERMINED BY TRACING THE WIREWRAP CONNECTIONS (VIA THE LOGIC WIRELIST) BACK TO THIS HEADER CHIP

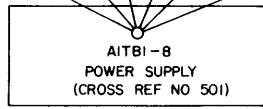
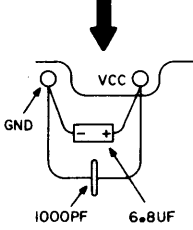
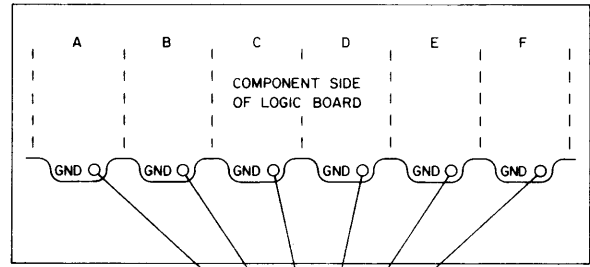
NOTES

1 THE FOLLOWING SHEETS ARE THE LOGICAL DIAGRAMS FOR THE LOGIC (WIREWRAP) BOARD

POWER CONNECTIONS



GROUND CONNECTIONS



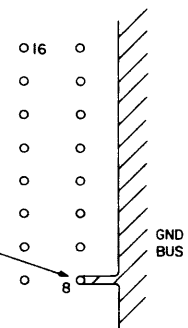
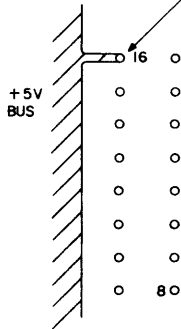
+5V BUS INPUTS

GND BUS INPUTS



PIN 16 OF EACH CHIP LOCATION CONNECTS TO +5V BUS EXCEPT AT CHIP LOCATIONS A01, A02, A03, A04, A06, AND A20

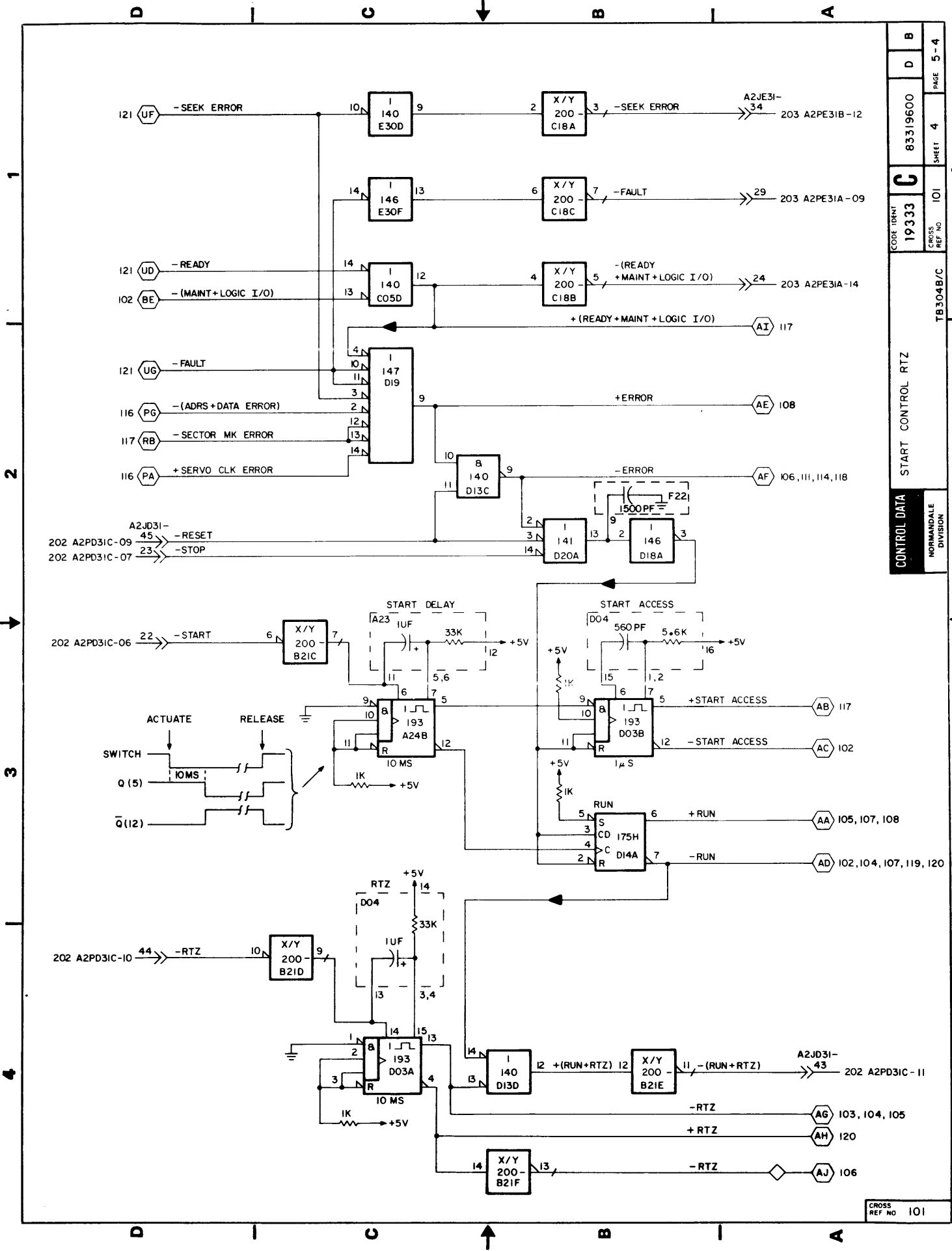
PIN 8 OF EACH CHIP LOCATION CONNECTS TO GND BUS EXCEPT AT CHIP LOCATIONS A01, A02, A03, A04, A19, D04, F01, AND F06



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| | | | | |
|---------------------|--------------|----------|-------|-----|
| CONTROL DATA | CODE IDENT | 83319600 | PAGE | 5-3 |
| | 19333 | C | C | A |
| LOGIC BOARD | CROSS REF NO | 100 | SHEET | 3 |
| | TB304B/C | | | |
| NORMANDALE DIVISION | | | | |
| CROSS REF NO | 100 | | | |

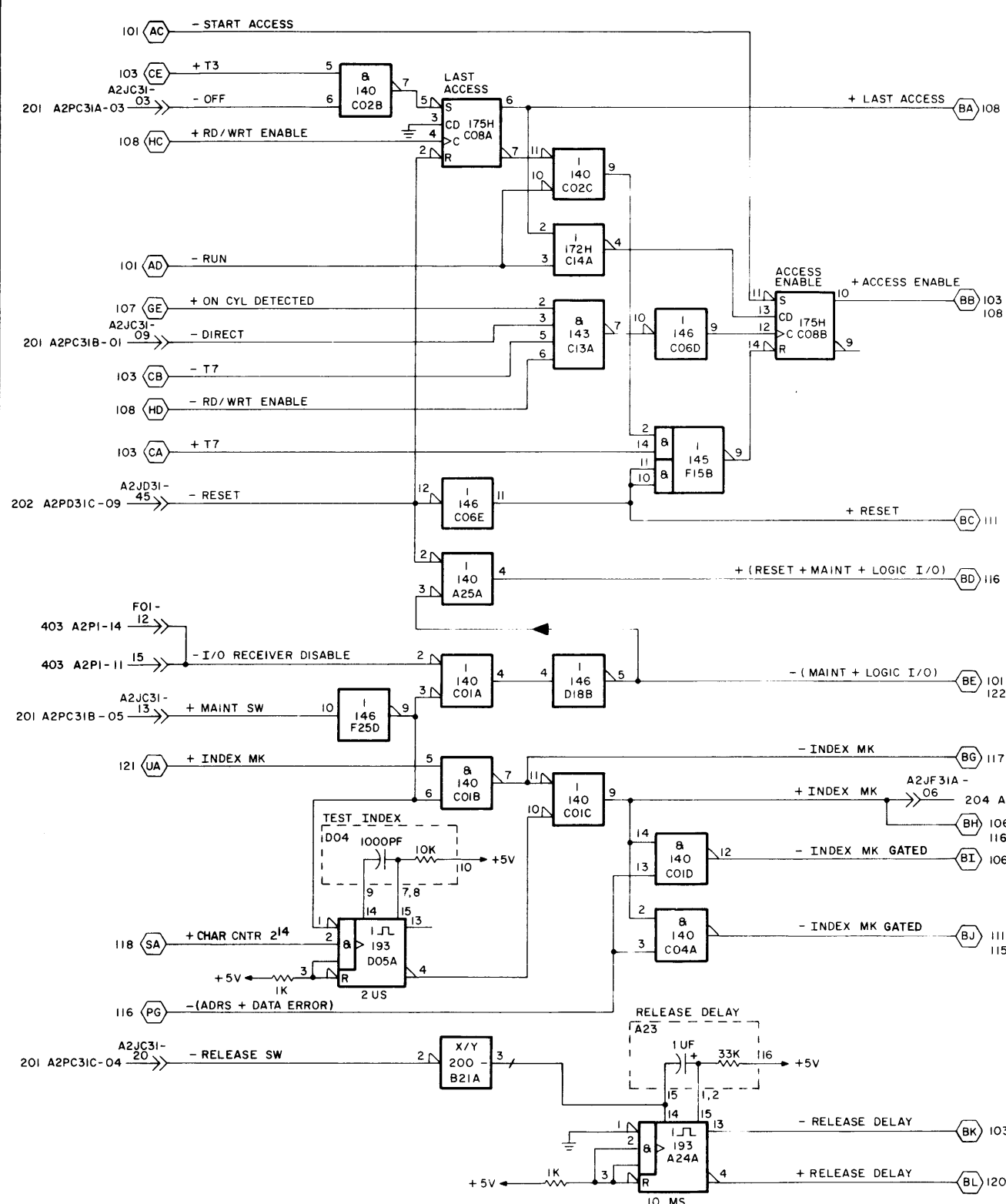
D I C B A



| | | | |
|--------------|---------------------|----------|----------|
| CONTROL DATA | START CONTROL RTZ | TB304B/C | PAGE 5-4 |
| | NORMANDALE DIVISION | | |
| CODE 18RRT | 19333 | 83319600 | SHEET 4 |
| CROSS REF NO | 101 | | |

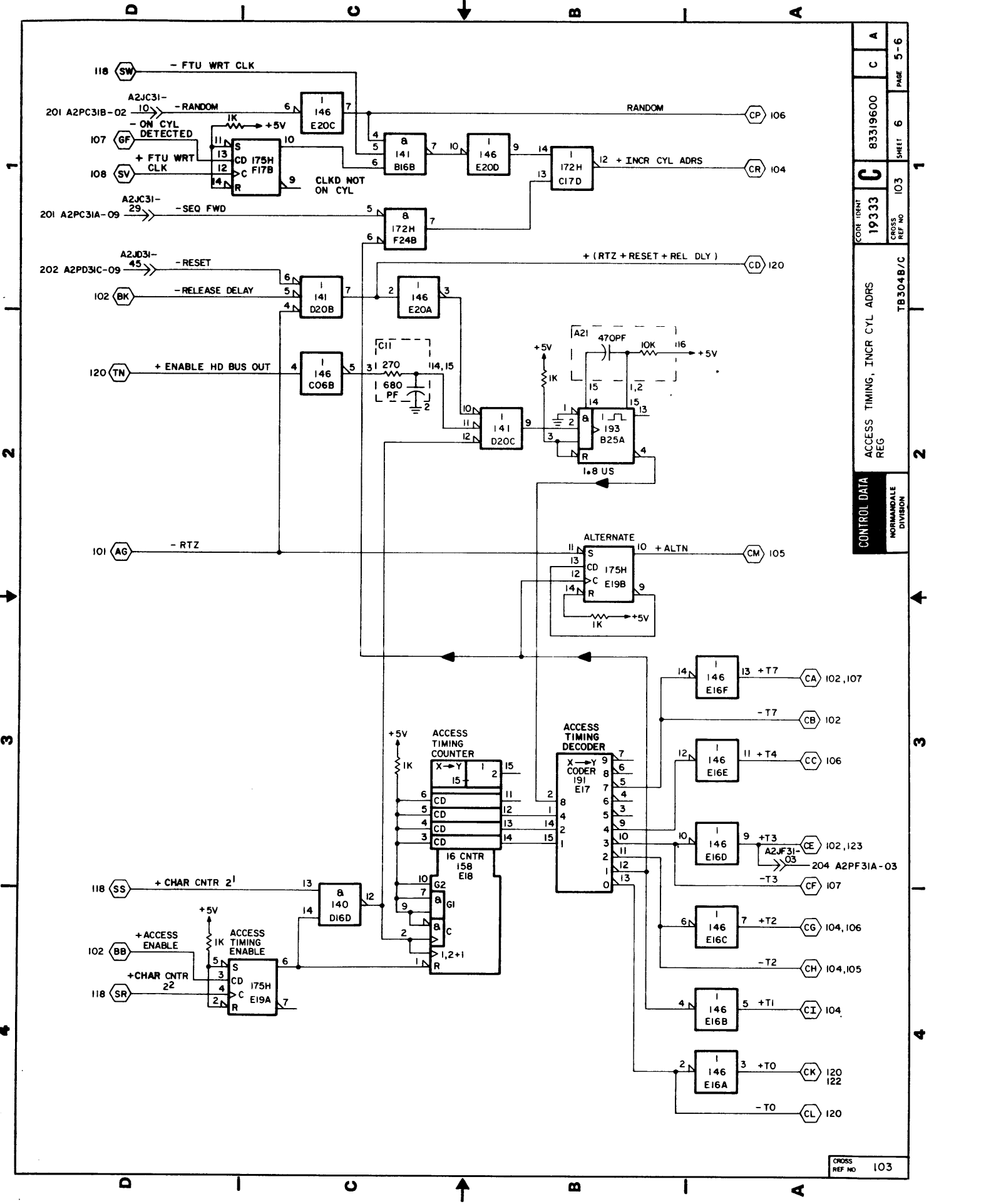
CROSS REF NO 101

D I C B A

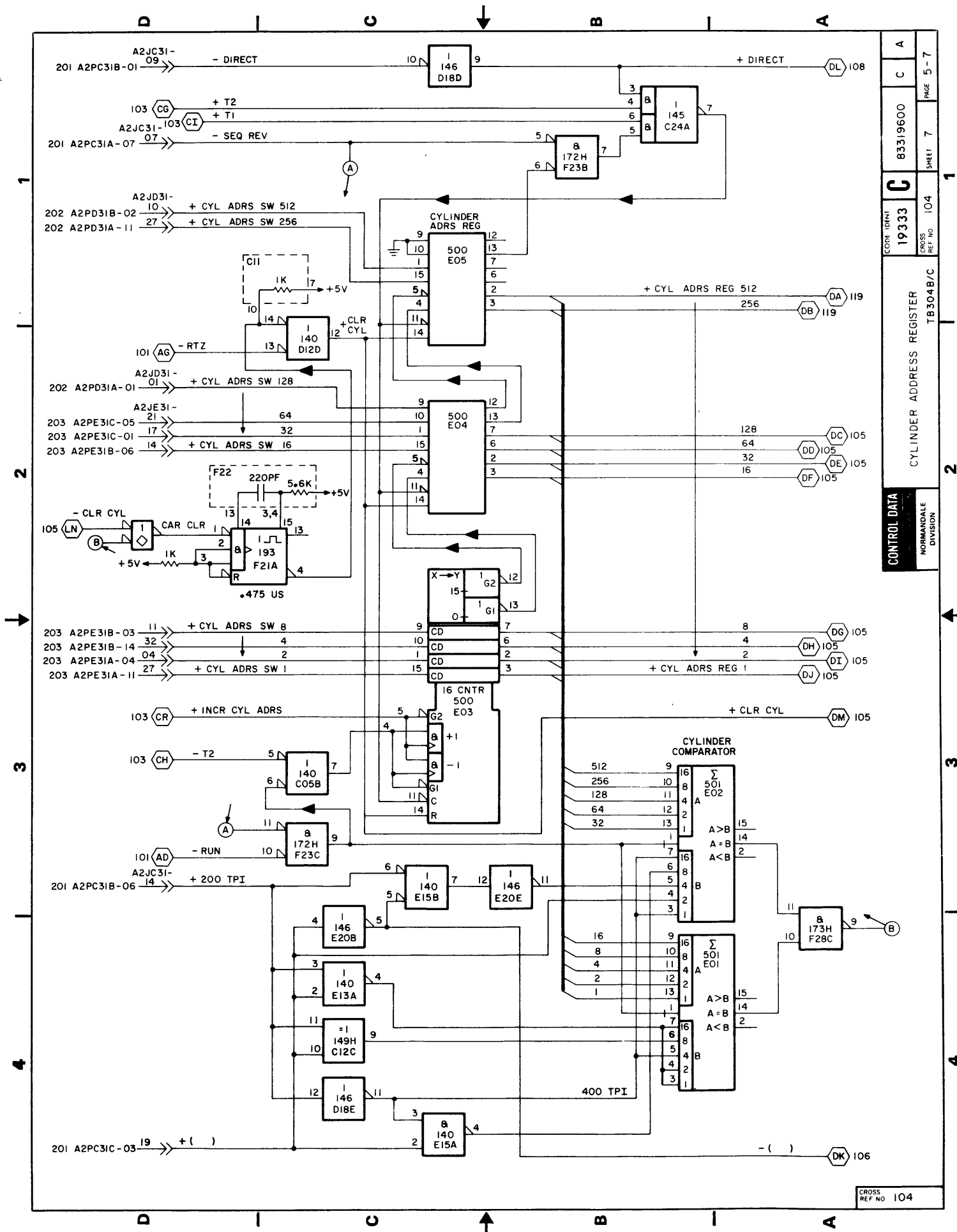


| | | | | | | | |
|---------------------------------|--------|----------------------|-----|-------|---|------|-----|
| CORE IDENT | 19333 | PAGE | 5 | SHEET | 5 | PAGE | 5-5 |
| | REF NO | | 102 | | | | |
| ACCESS CONTROL, INDEX DETECTION | | TB304B/C | | | | | |
| CONTROL DATA | | NORMANVILLE DIVISION | | | | | |

D I C B A



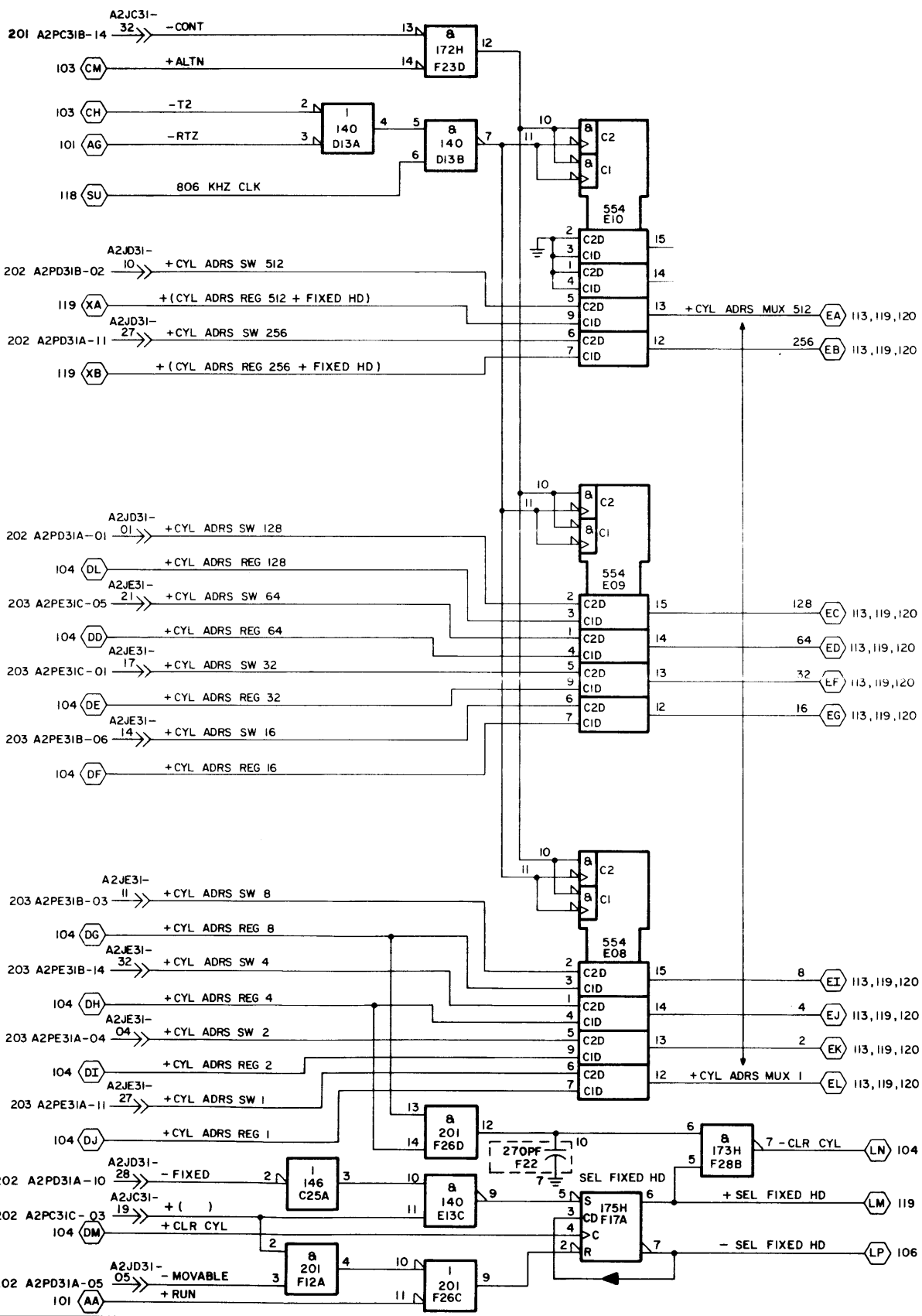
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| 1 | 2 | 3 | 4 |
| ACCESS TIMING, INCR CYL AdRS REG | | | |
| CONTROL DATA | | | |
| NORMANDEALE DIVISION | | | |
| CORR IDENT 19333 | | TB304B/C | |
| GROSS REF NO 103 | | PAGE 5-6 | |
| 83319600 | | SHEET 6 | |
| C | | A | |



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|---------------------|----------|-------|-----|---------------------------|-----|
| CODE IDENT | 83319600 | SHEET | 7 | PAGE | 5-7 |
| CROSS REF NO | 19333 | CYCLE | 104 | CYLINDER ADDRESS REGISTER | |
| CONTROL DATA | | | | | |
| NORMANDALE DIVISION | | | | | |
| TB304B/C | | | | | |

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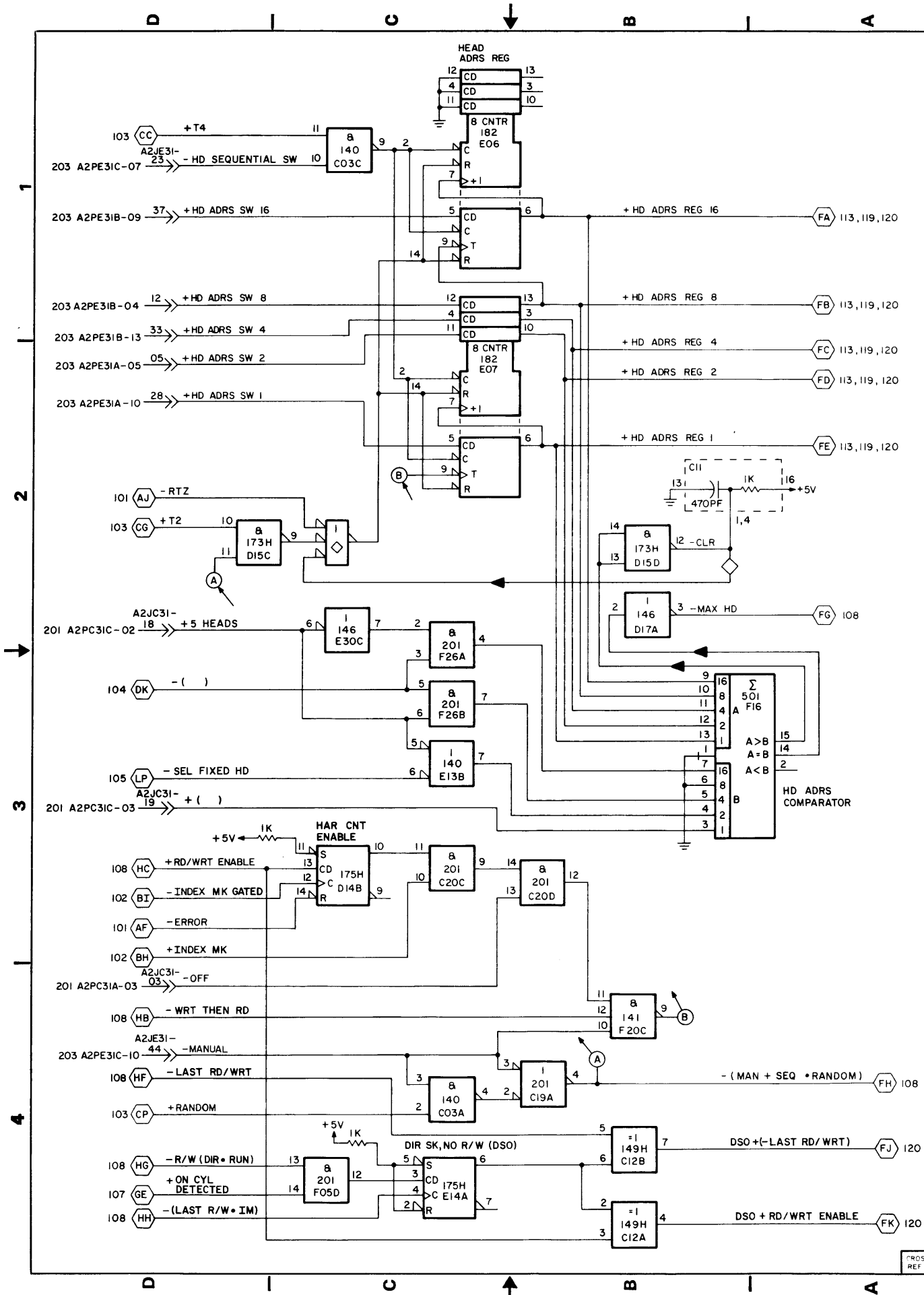
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| CODE IDENT 19333 | CROSS REF NO 105 | SHEET 8 | PAGE 5-8 |
| CYLINDER ADDRESS MUX | | TBS04B/C | |
| CONTROL DATA | | NORMAN DALE DIVISION | |

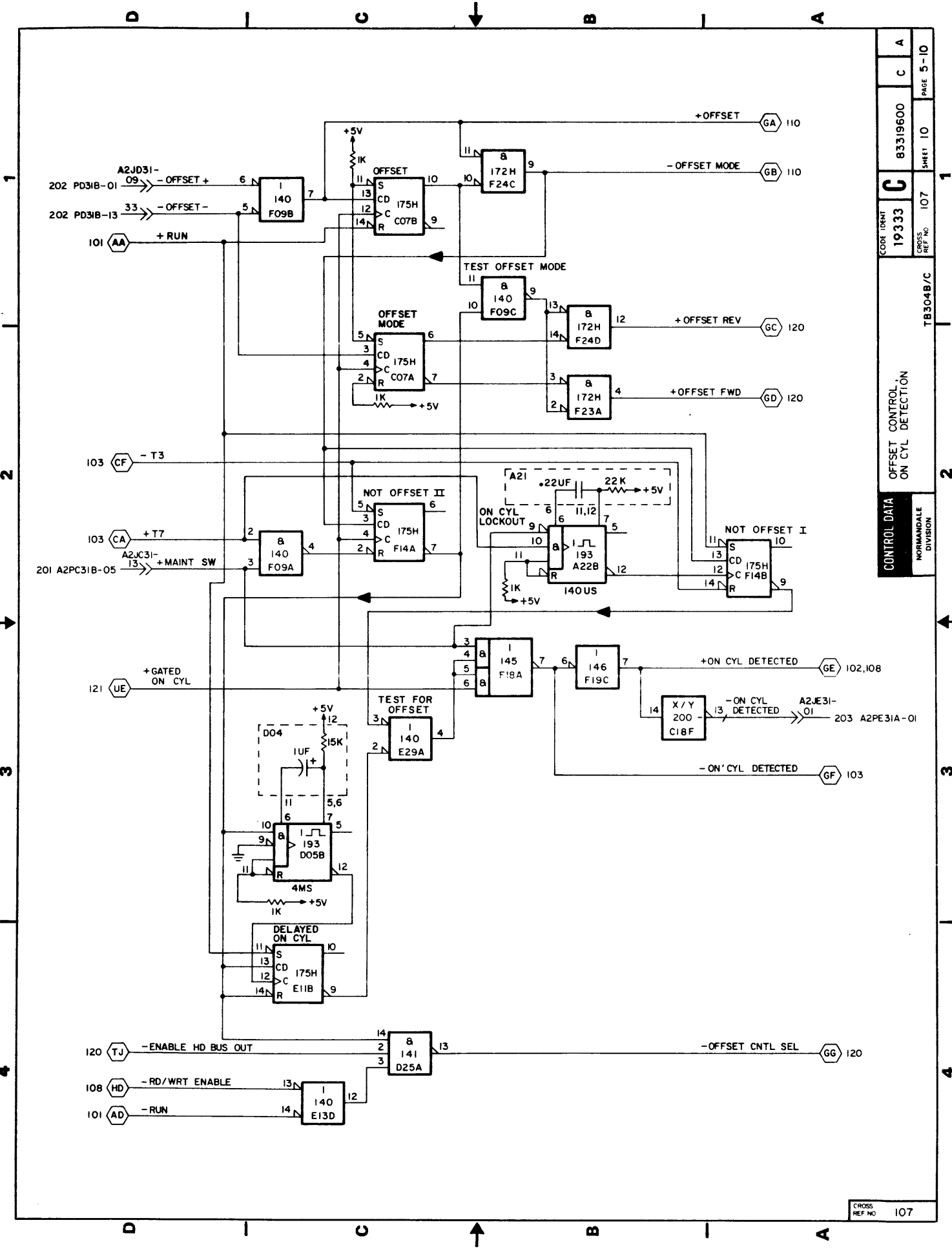


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CROSS REF NO 105

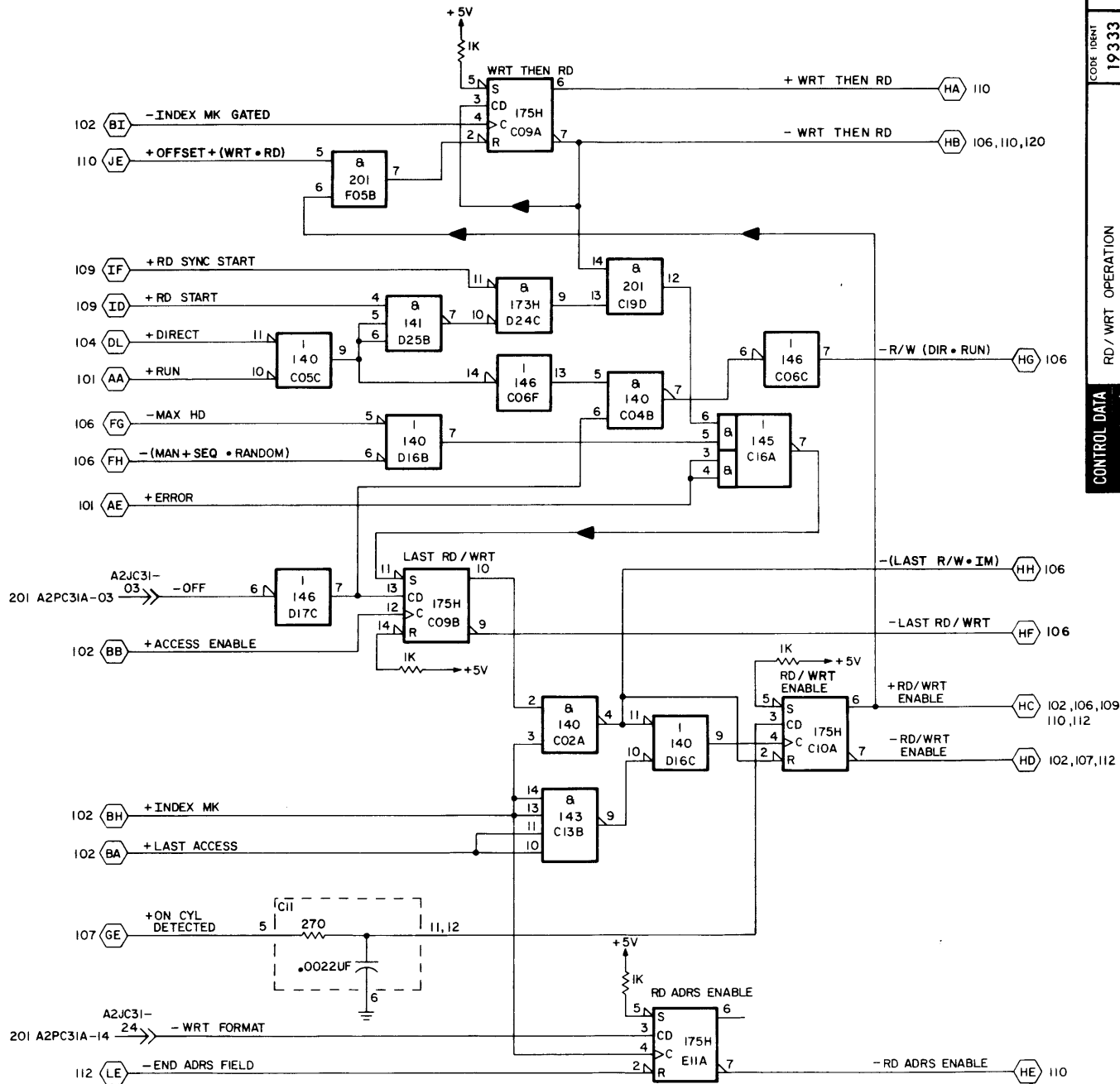




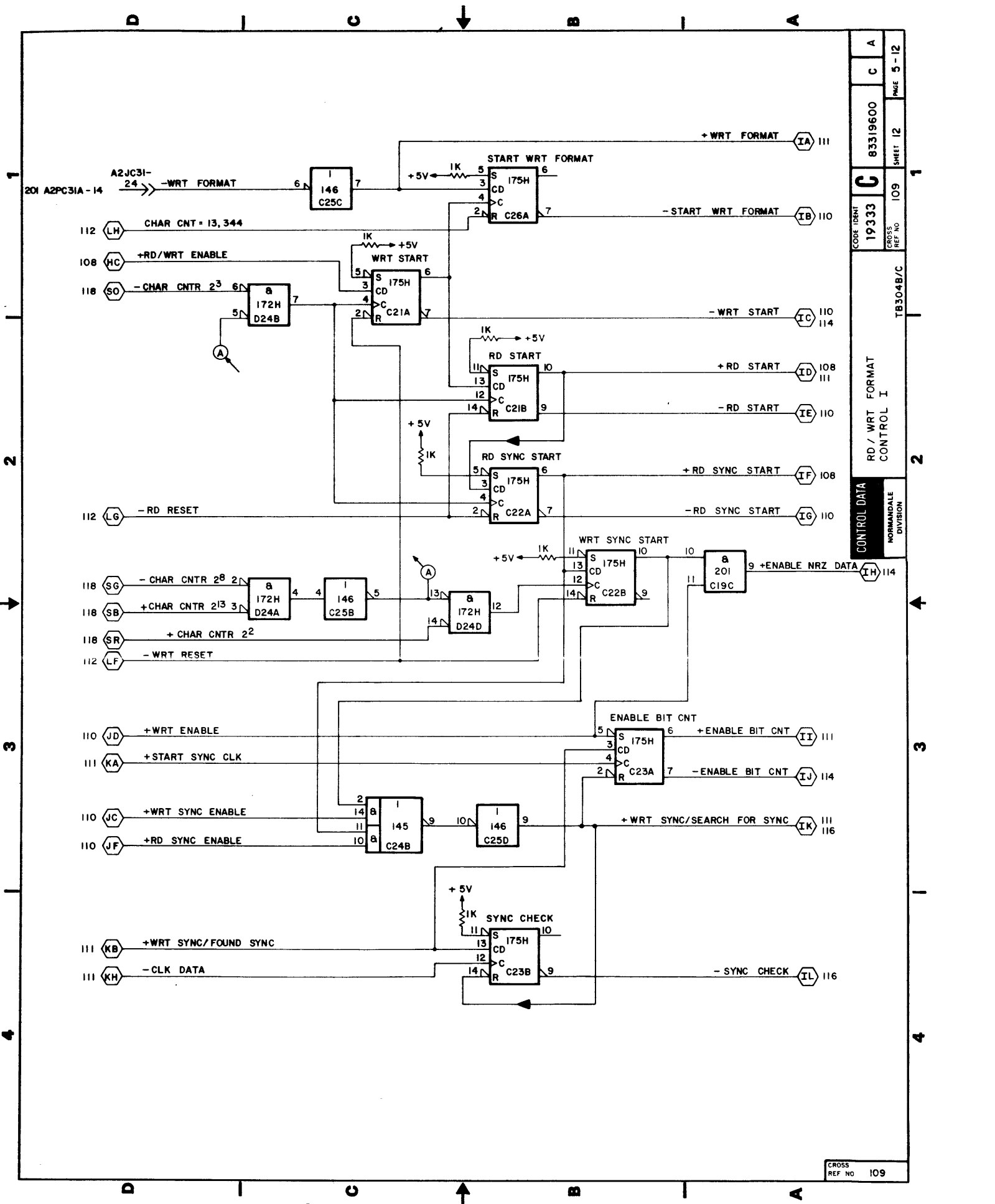
| | | | | |
|---------------------------------|---------------------|----------|----------|-----------|
| CONTROL DATA | CODE IDENT | 85319600 | SHEET 10 | PAGE 5-10 |
| | 19333 | | | |
| OFFSET CONTROL ON CYL DETECTION | REV. REF. NO. | 107 | TB304B/C | |
| | NORMANDALE DIVISION | | | |

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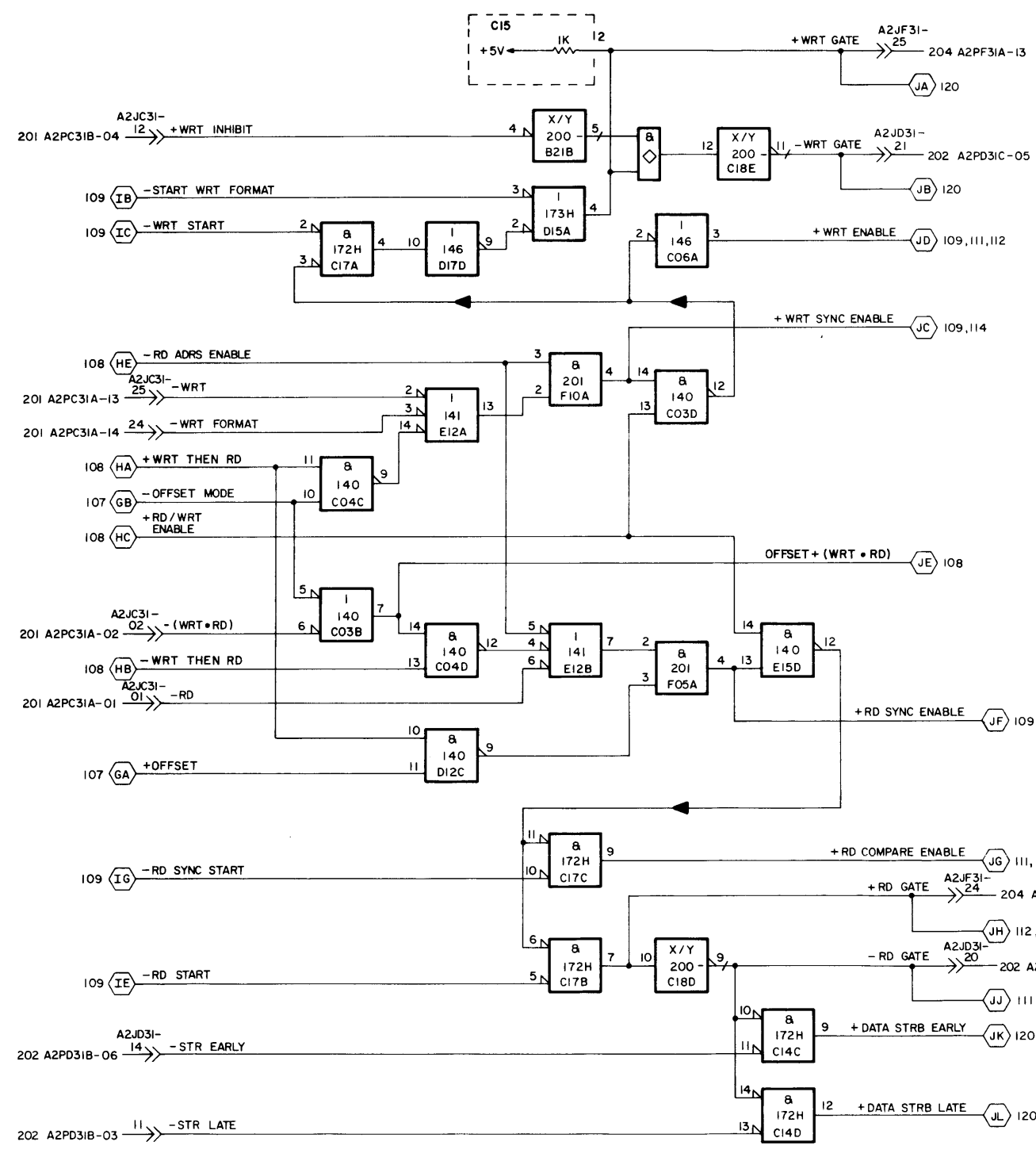
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| 1 | C | A |
| 83319600 | | |
| 19333 | | |
| 108 | | |
| TB304 B/C | | |
| RD/WRT OPERATION START CONTROL | | |
| NORMANDALE DIVISION | | |



CODE IDENT 83319600
 CROSS REF NO 19333
 SHEET 12 PAGE 5-12
 TB304B/C
 RD / WRT FORMAT CONTROL I
 CONTROL DATA
 NORMANDALE DIVISION

D C B A

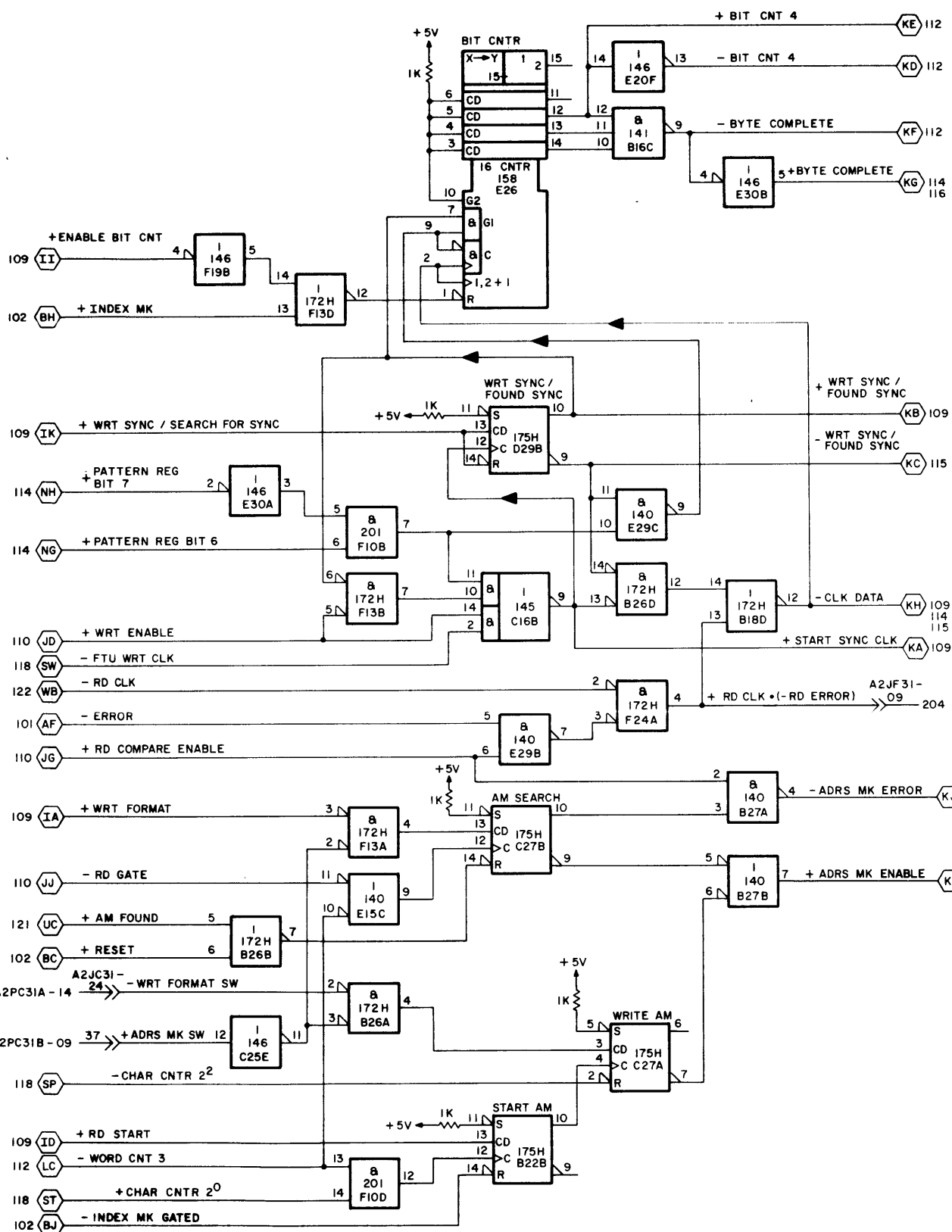
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| CODE IDENT | 83319600 | C | A |
| CROSS REF. NO. | 110 | SHEET | 13 |
| CONTROL DATA | | PAGE 5-13 | |
| RD/WRT FORMAT CONTROL II | | TB304B/C | |
| NORMANDALE DIVISION | | | |

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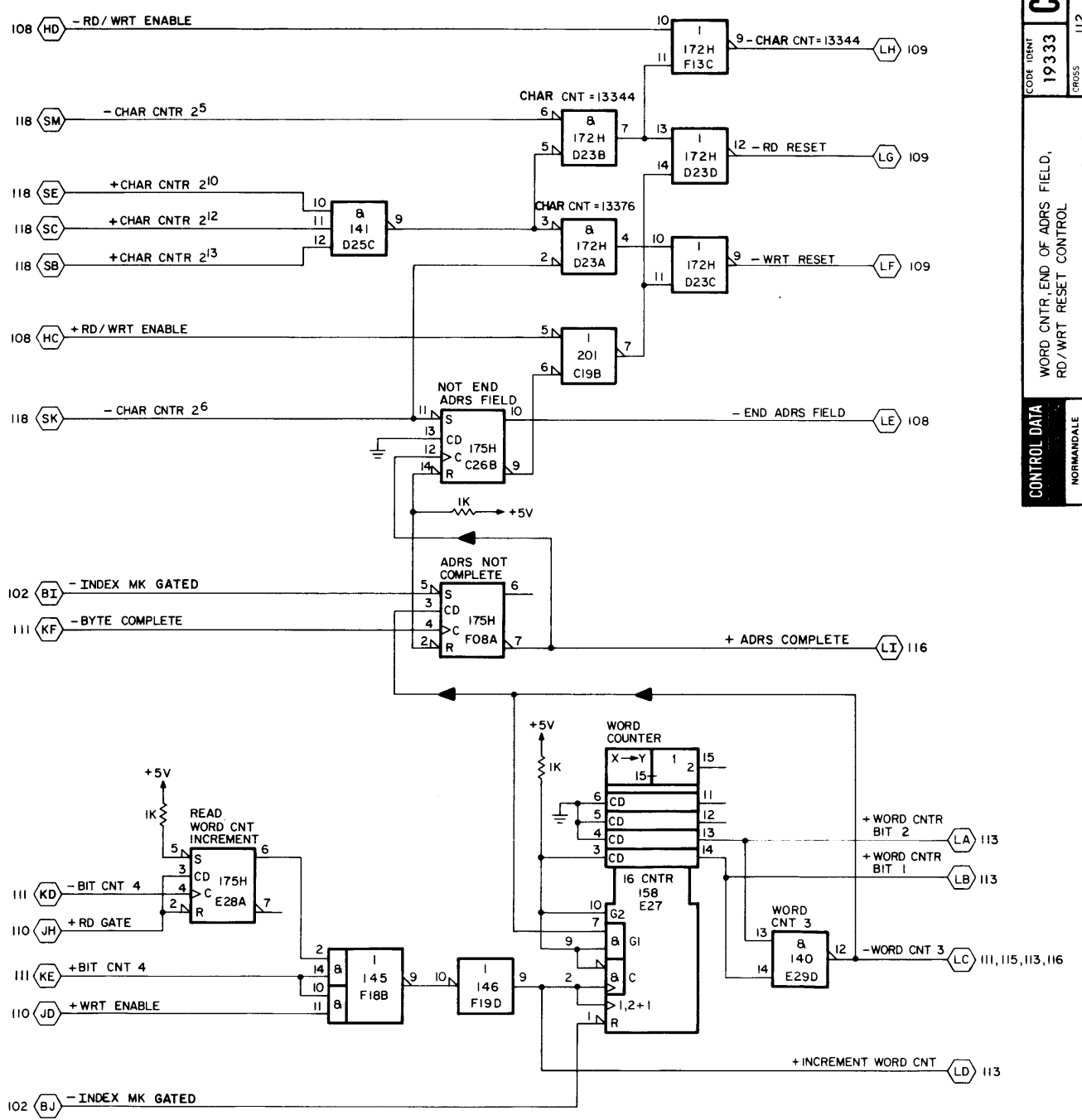
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83319600
 19333
 TB304B/C
 BIT CNTR, WRT SYNC / FOUND SYNC AND ADRS MK LOGIC
 CONTROL DATA
 NORMANDELE DIVISION

CROSS REF NO 111

D C B A

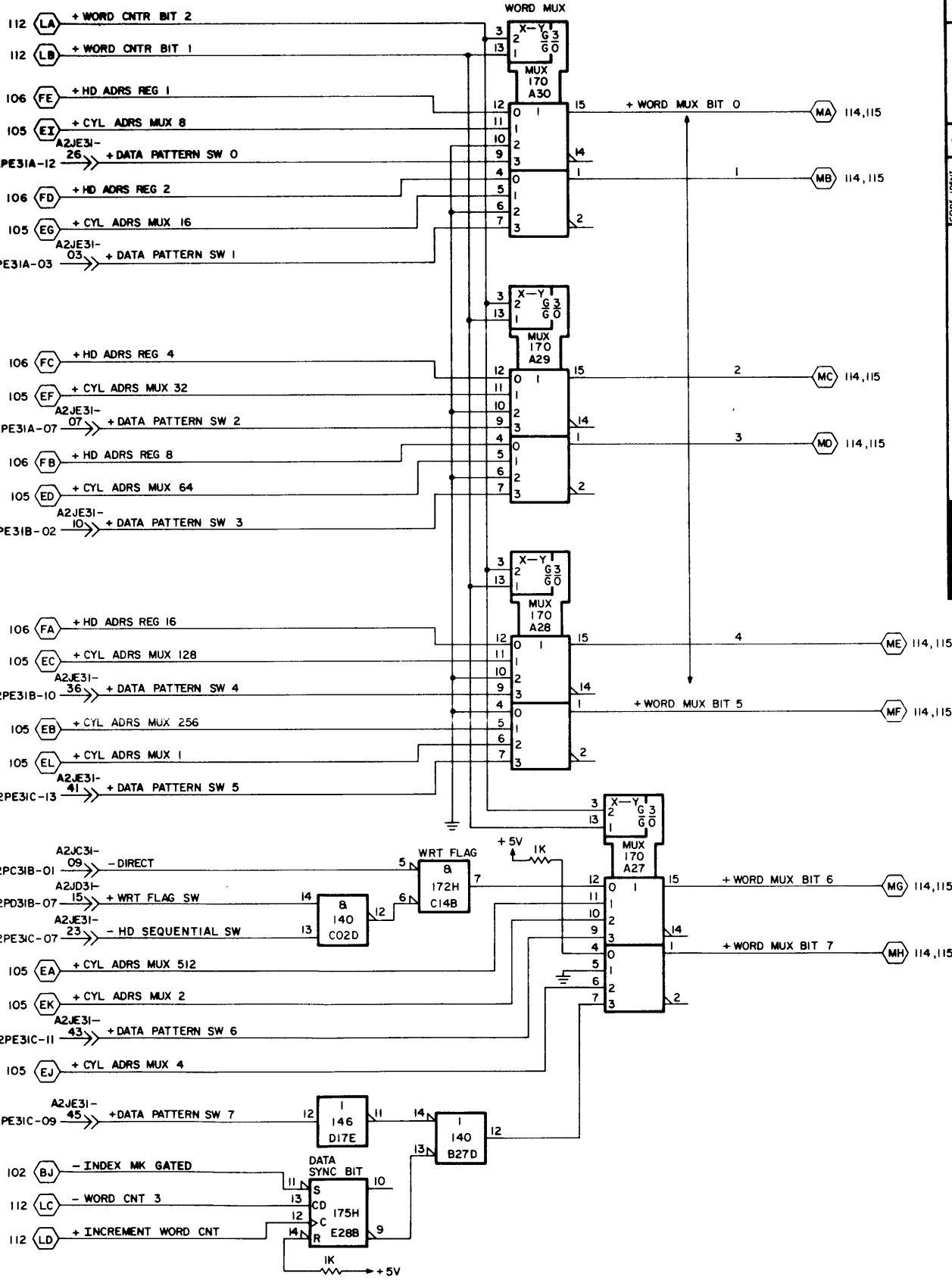


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|----------------------------------------------------|-------|----------|----------|-----------|
| CODE 108MT | C | 83319600 | SHEET 15 | PAGE 5-15 |
| CROSS REF NO | 19333 | 112 | | |
| WORD CNTR, END OF ADRS FIELD, RD/WRT RESET CONTROL | | | | |
| TB304B/C | | | | |
| CONTROL DATA | | | | |
| NORMANDALE DIVISION | | | | |

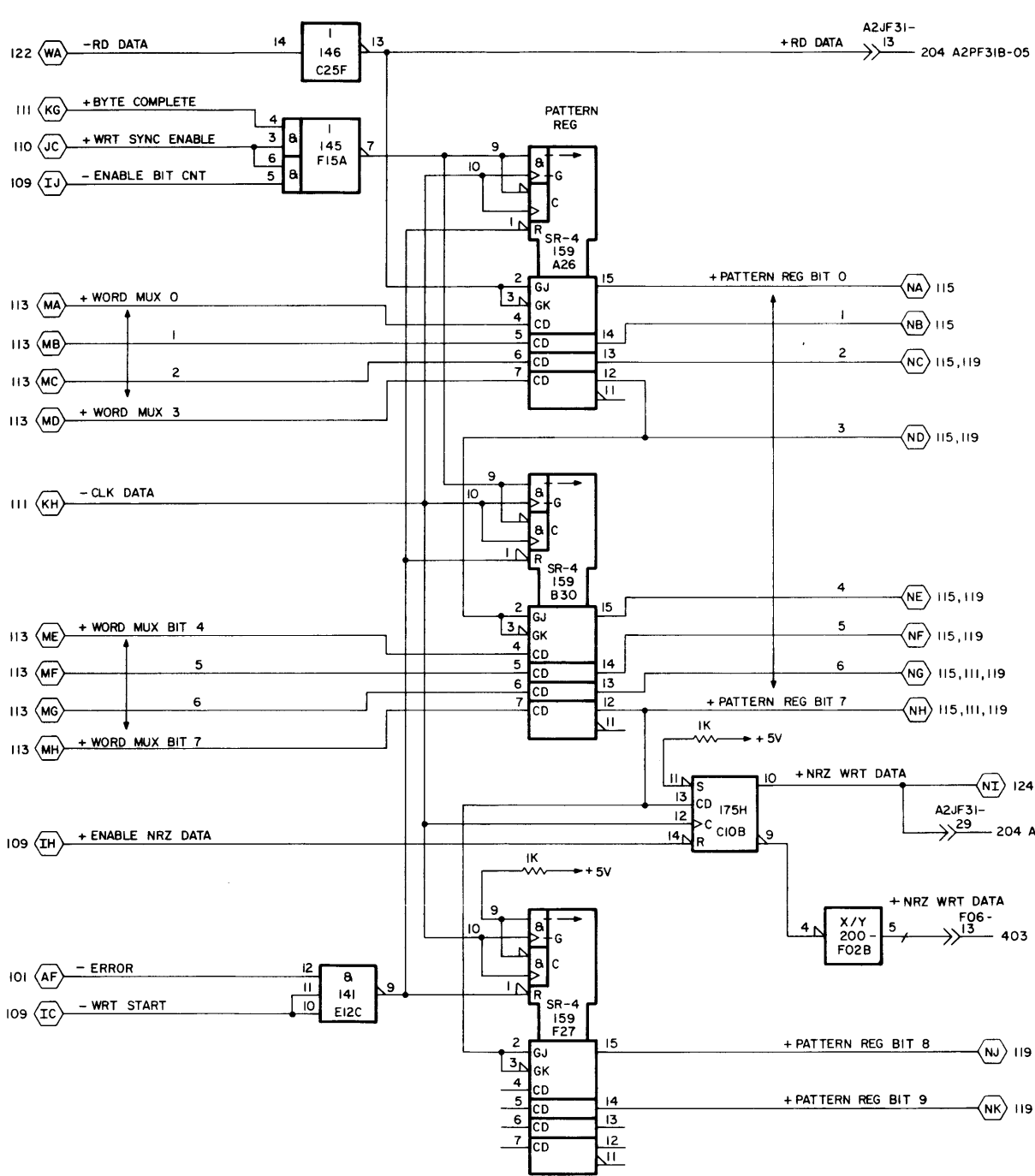
D I C B A

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| CODE IDENT | 83319600 | PAGE | 5 - 16 |
| CROSS REF NO | 19333 | SHEET | 16 |
| TB304B/C | | WORD MUX | |
| CONTROL DATA | | NORMANDEALE DIVISION | |

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| CODE ID/INT | 19333 | 83319600 | C | A |
| CROSS REF NO | 114 | SHEET 17 | PAGE 5-17 | |
| TB304B/C | | | | |
| PATTERN REG | | | | |
| CONTROL DATA | | | | |
| NORMAN DALE DIVISION | | | | |
| CROSS REF NO 114 | | | | |

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| CODE IDENT | 83319600 | A |
| 19333 | C | C |
| REVISE REF NO | 115 | SHEET 18 |
| | | PAGE 5-18 |
| RD DATA COMPARE | | |
| TB304 B/C | | |

110 JG +RD COMPARE ENABLE

114 NA +PATTERN REG BIT 0

114 NB +PATTERN REG BIT 1

114 NC +PATTERN REG BIT 2

114 ND +PATTERN REG BIT 3

113 MA +WORD MUX BIT 0

113 MB +WORD MUX BIT 1

113 MC +WORD MUX BIT 2

113 MD +WORD MUX BIT 3

114 NE +PATTERN REG BIT 4

114 NF +PATTERN REG BIT 5

114 NG +PATTERN REG BIT 6

114 NH +PATTERN REG BIT 7

113 ME +WORD MUX BIT 4

113 MF +WORD MUX BIT 5

113 MG +WORD MUX BIT 6

113 MH +WORD MUX BIT 7

111 KH -CLK DATA

112 LC -WORD CNT 3

111 KC -WRT SYNC/FOUND SYNC

102 BJ -INDEX MK GATED

+5V

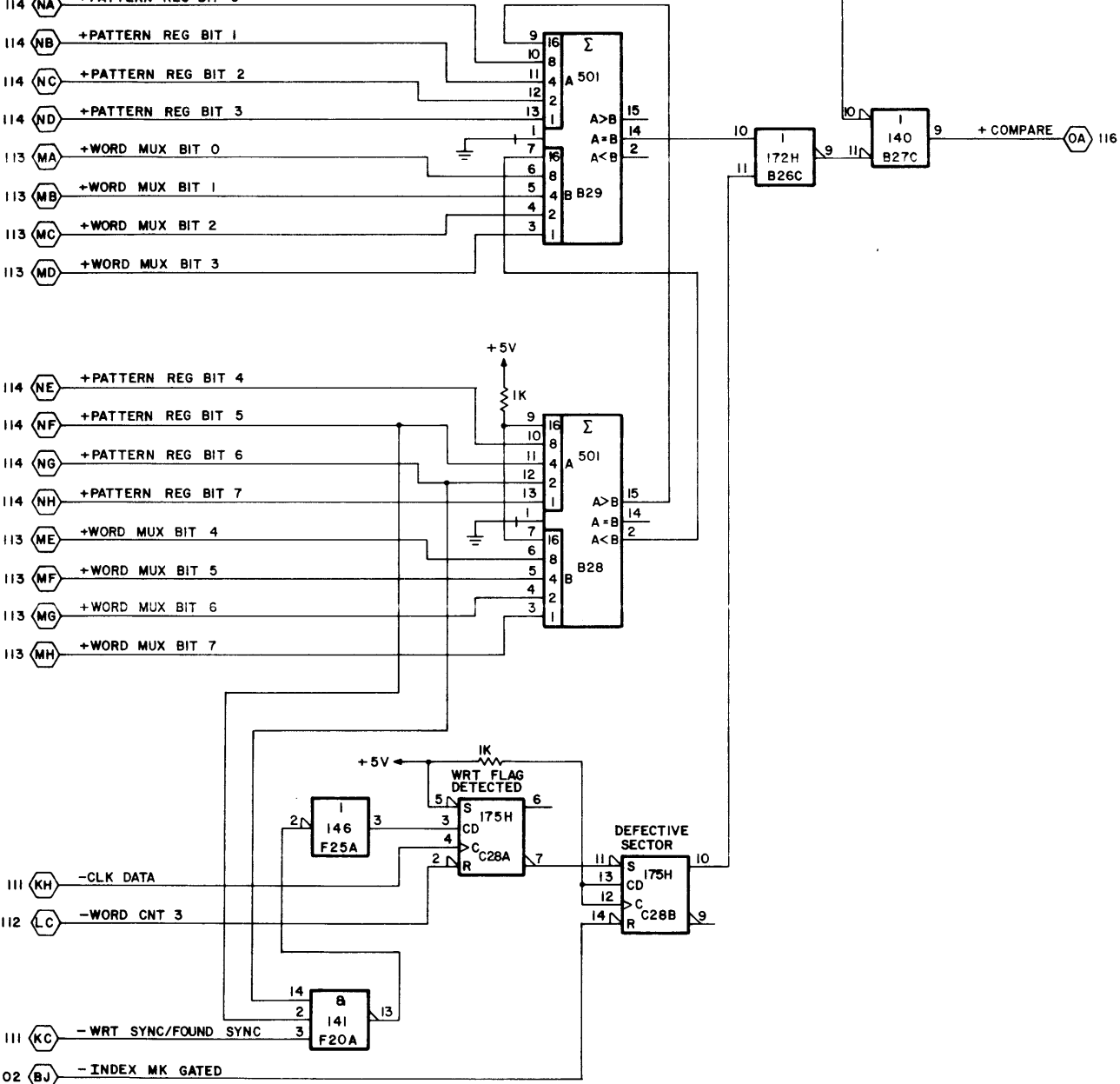
1K

+5V

1K

WRT FLAG DETECTED

DEFECTIVE SECTOR



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| CONTROL DATA | |
| NORMANDALE DIVISION | |
| RD DATA COMPARE | |
| TB304 B/C | |
| CODE IDENT | 83319600 |
| 19333 | C |
| REVISE REF NO | 115 |
| | SHEET 18 |
| | PAGE 5-18 |
| RD DATA COMPARE | |
| TB304 B/C | |
| RD DATA COMPARE | |
| TB304 B/C | |

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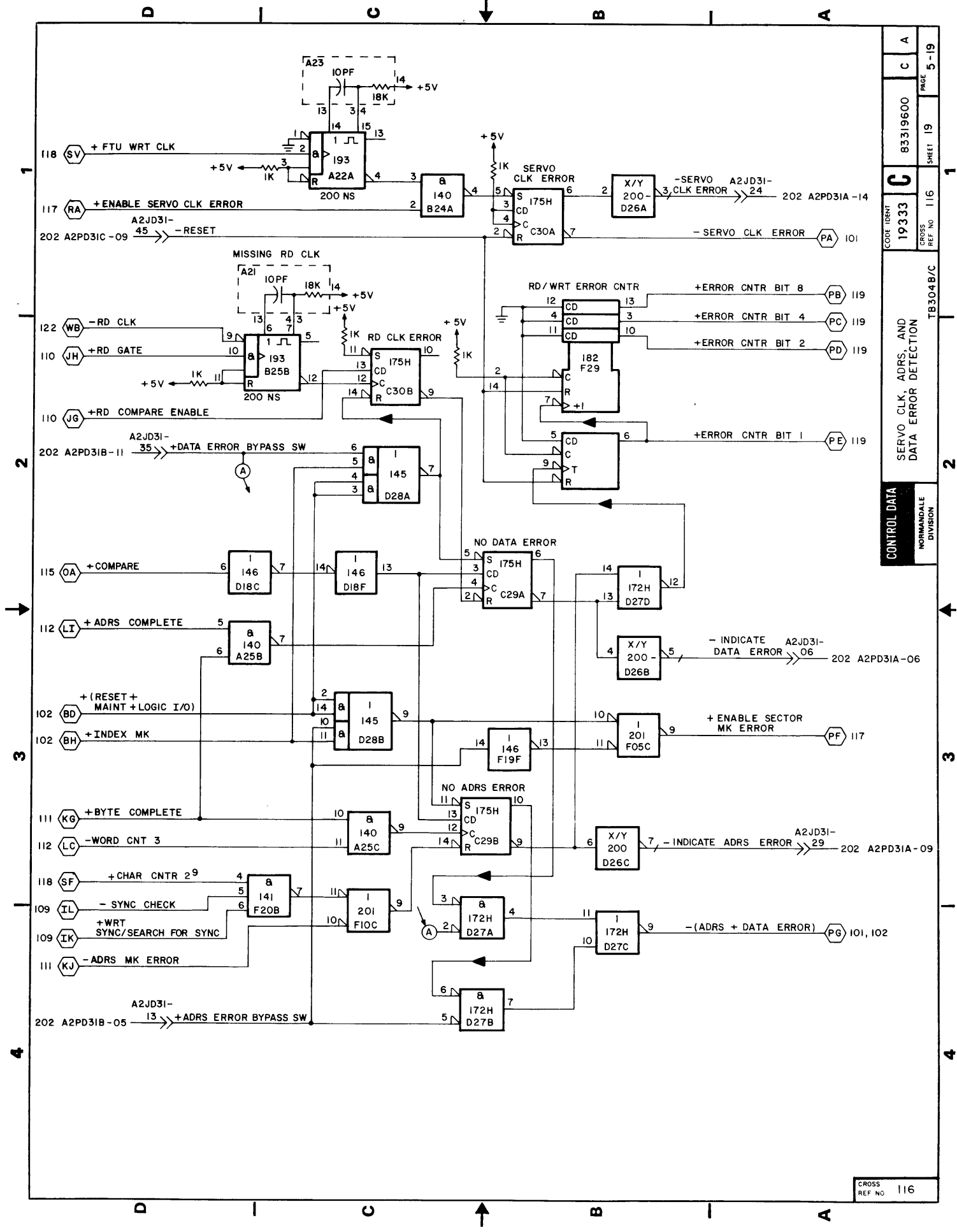
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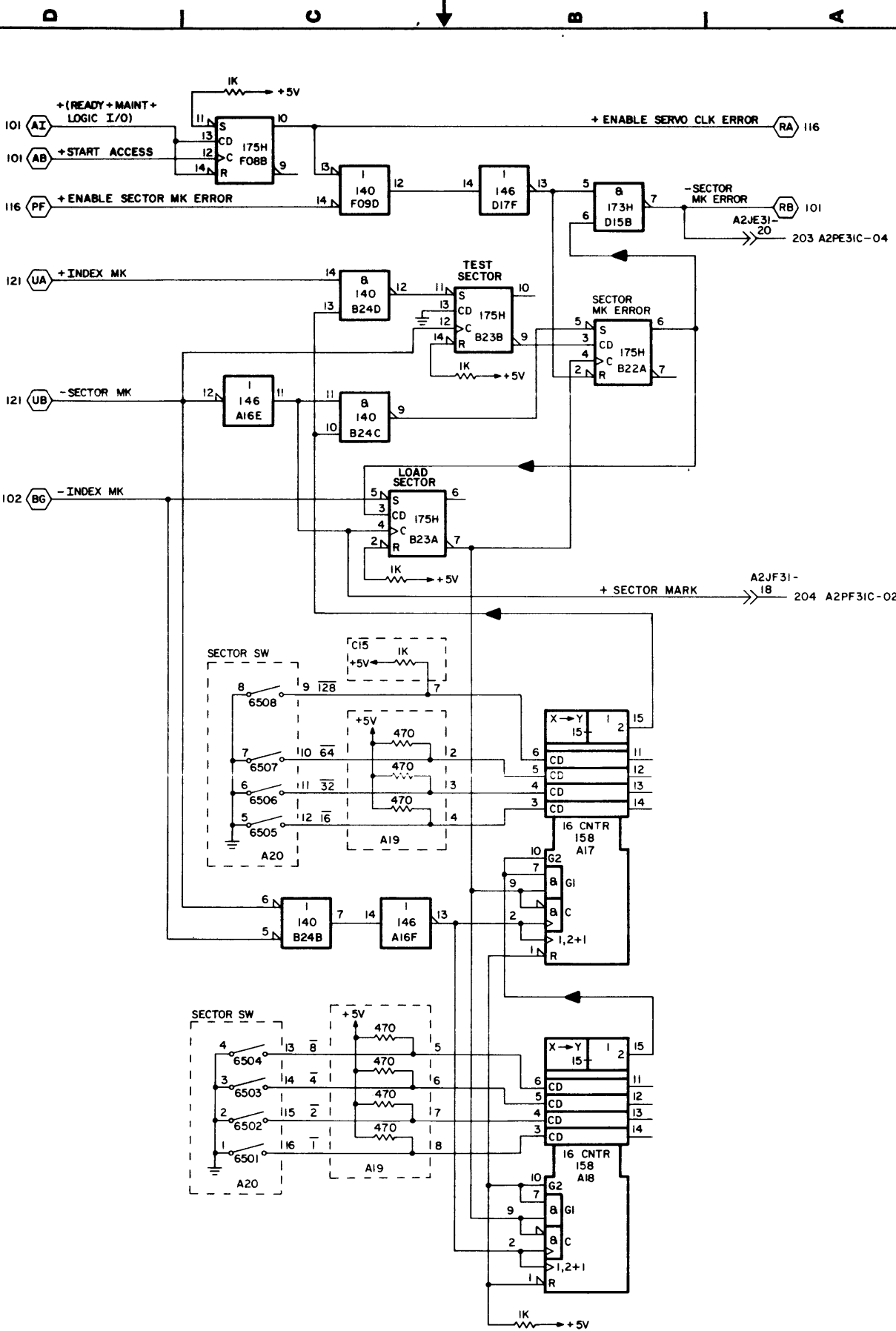
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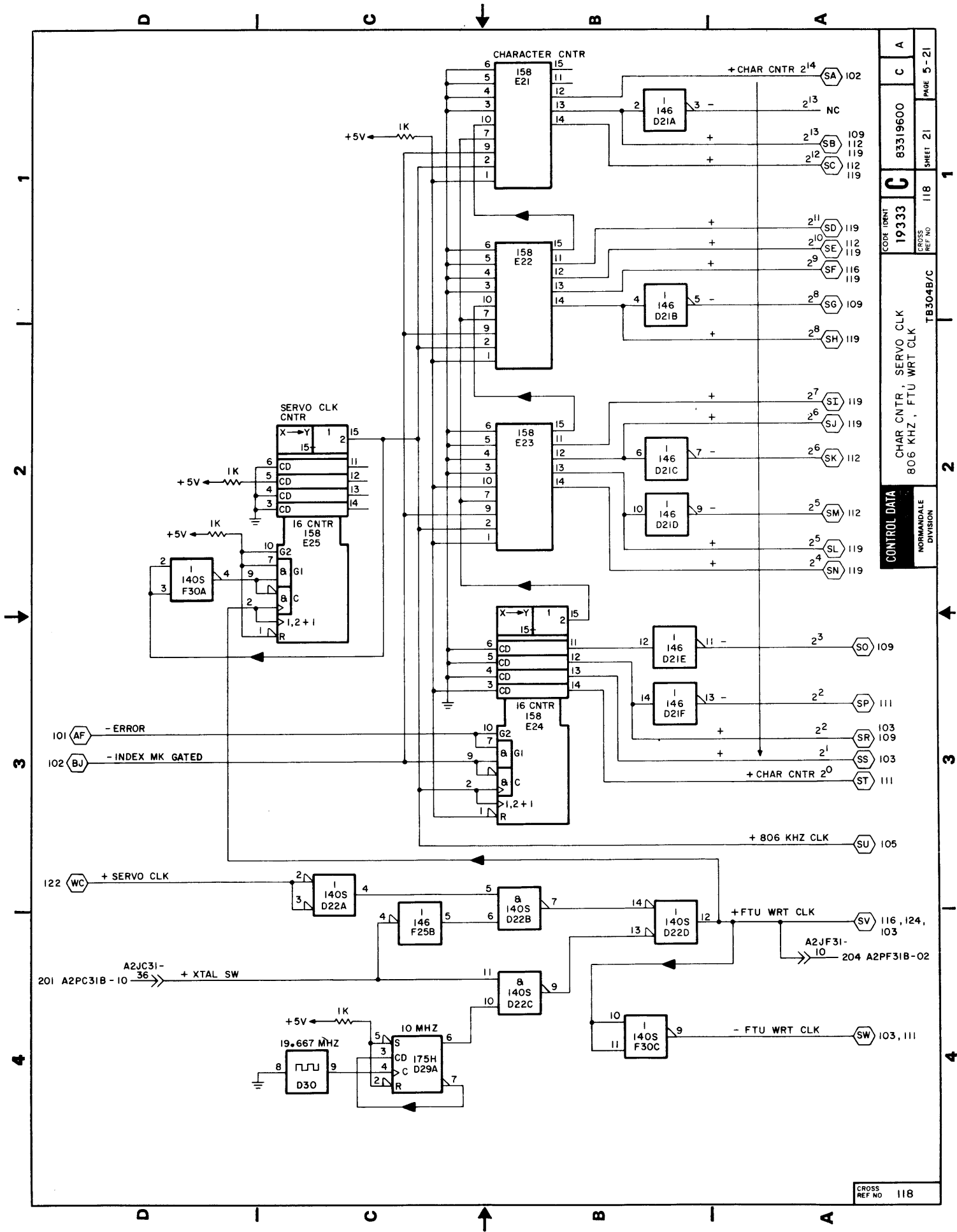




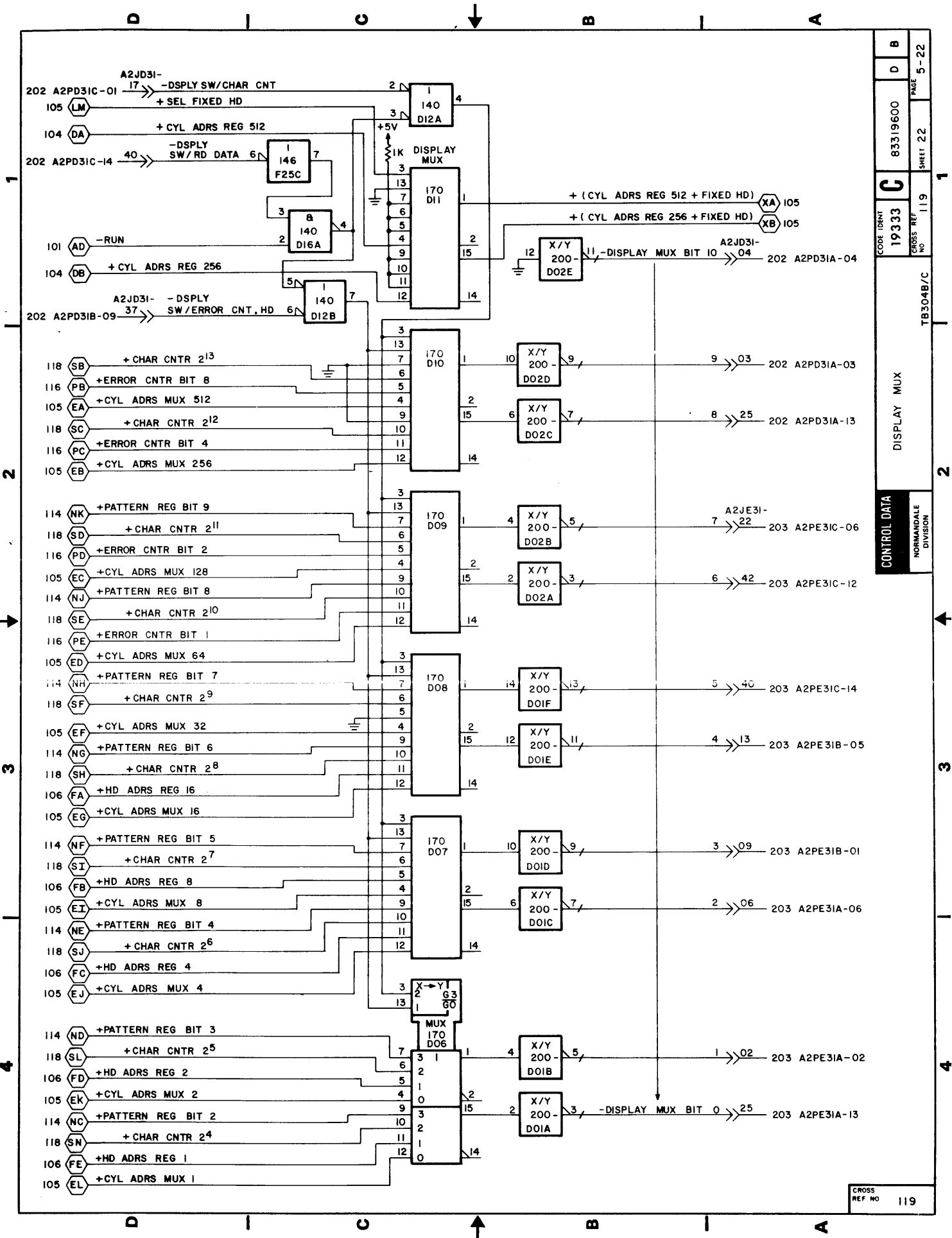
CONTROL DATA
 SECTOR COUNTING AND
 ERROR DETECTION
 NORMAN DALE
 DIVISION

CODE 18MT
19333
 CROSS
 REF NO
 TB304B/C

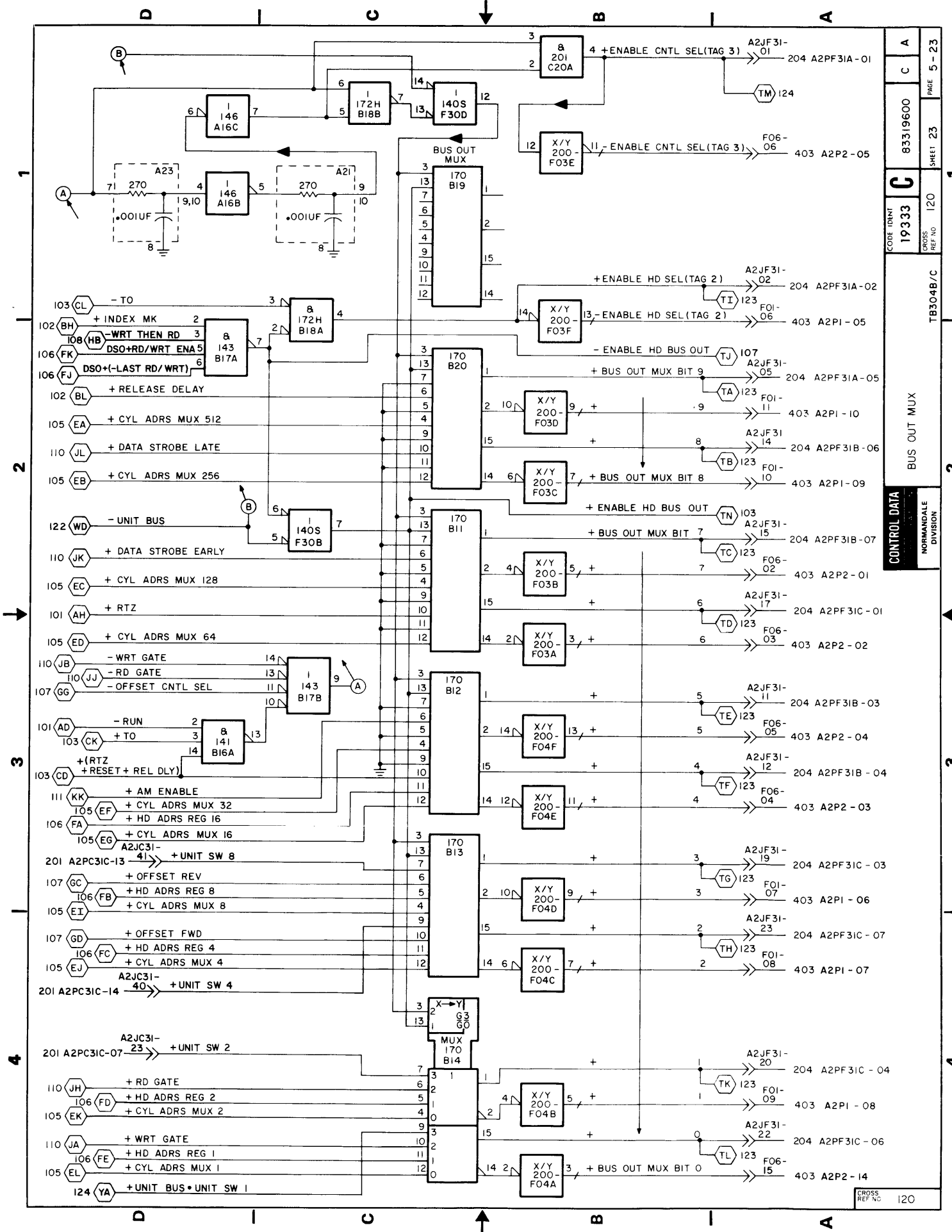
83319600
 PAGE 20
 SHEET 20
 5-20
 CROSS
 REF NO 117



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| CODE IDENT | 83319600 | A |
| CROSS REF NO | 19333 | C |
| CROSS REF NO | 118 | 11B |
| SHEET | 21 | PAGE 5-21 |
| CONTROL DATA | | |
| CHAR CNTR, SERVO CLK | | |
| 806 KHZ, FTU WRT CLK | | |
| TB304B/C | | |
| NORMANDALE DIVISION | | |



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| CODE IDENT | 83319600 | D | B |
| CROSS REF NO | 19333 | SHEET 22 | PAGE 5-22 |
| CONTROL DATA | | | |
| NORMANDALE DIVISION | | | |
| TB304B/C | | | |
| DISPLAY MUX | | | |



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| CORE ID# | 19333 | PAGE 5 - 23 |
| | 83319600 | |
| | SHEET 23 | |
| TB304B/C | | |
| BUS OUT MUX | | |
| CONTROL DATA | | |
| NORMANDALE DIVISION | | |
| CROSS REF. NO. | 120 | |

CROSS REF. NO. 120

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| CODE IDENT | 83319600 | PAGE | 5-24 |
| CROSS REF NO | 121 | SHEET | 24 |
| RECEIVERS I | | | |
| TB304B/C | | | |
| CONTROL DATA | | | |
| NORMANVILLE DIVISION | | | |

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403 A2PI-01 FOI-02 + INDEX MK

403 A2PI-14 15 - I/O RECEIVER DISABLE
403 A2PI-11 12

401 A2PA3IA-07 A2JA3I-07 + INDEX MK

402 A2PA3IC-09 45 - INDEX MK

402 A2PA3IC-07 23 - SECTOR MK

402 A2PA3IC-08 46 + SECTOR MK

401 A2PB3IA-10 A2JB3I-28 + INDEX MK

401 A2PB3IA-05 05 - INDEX MK

402 A2PA3IB-02 A2JA3I-10 - SECTOR MK

402 A2PA3IB-13 33 + SECTOR MK

403 A2PI-04 FOI-05 + ADRS MK FOUND

401 A2PB3IC-08 A2JB3I-46 + ADRS MK FOUND

401 A2PB3IC-07 23 - ADRS MK FOUND

401 A2PB3IB-02 10 - READY

401 A2PB3IB-13 33 + READY

401 A2PA3IA-02 A2JA3I-02 - BUSY

401 A2PA3IA-13 25 + BUSY

401 A2PB3IA-07 A2JB3I-07 - ON CYL

401 A2PB3IA-08 30 + ON CYL

403 A2PI-02 FOI-03 - ON CYL

402 A2PA3IC-11 A2JA3I-43 - SEEK END

402 A2PA3IC-05 21 + SEEK END

402 A2PA3IB-03 11 - SEEK ERROR

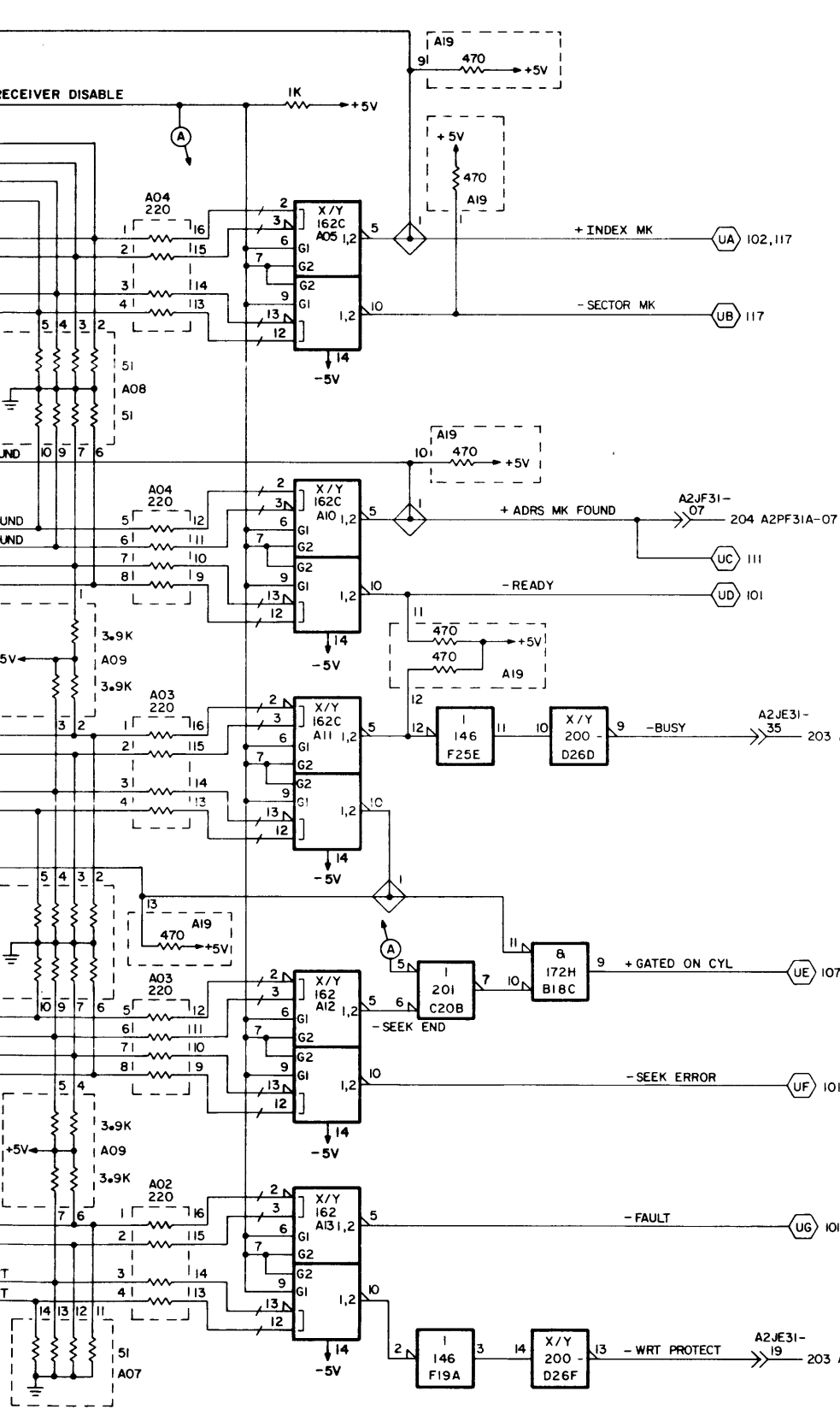
402 A2PA3IB-12 34 + SEEK ERROR

401 A2PB3IA-06 A2JB3I-06 - FAULT

401 A2PB3I-09 29 + FAULT

401 A2PA3IA-10 A2JA3I-28 - WRT PROTECT

401 A2PA3IA-05 05 + WRT PROTECT



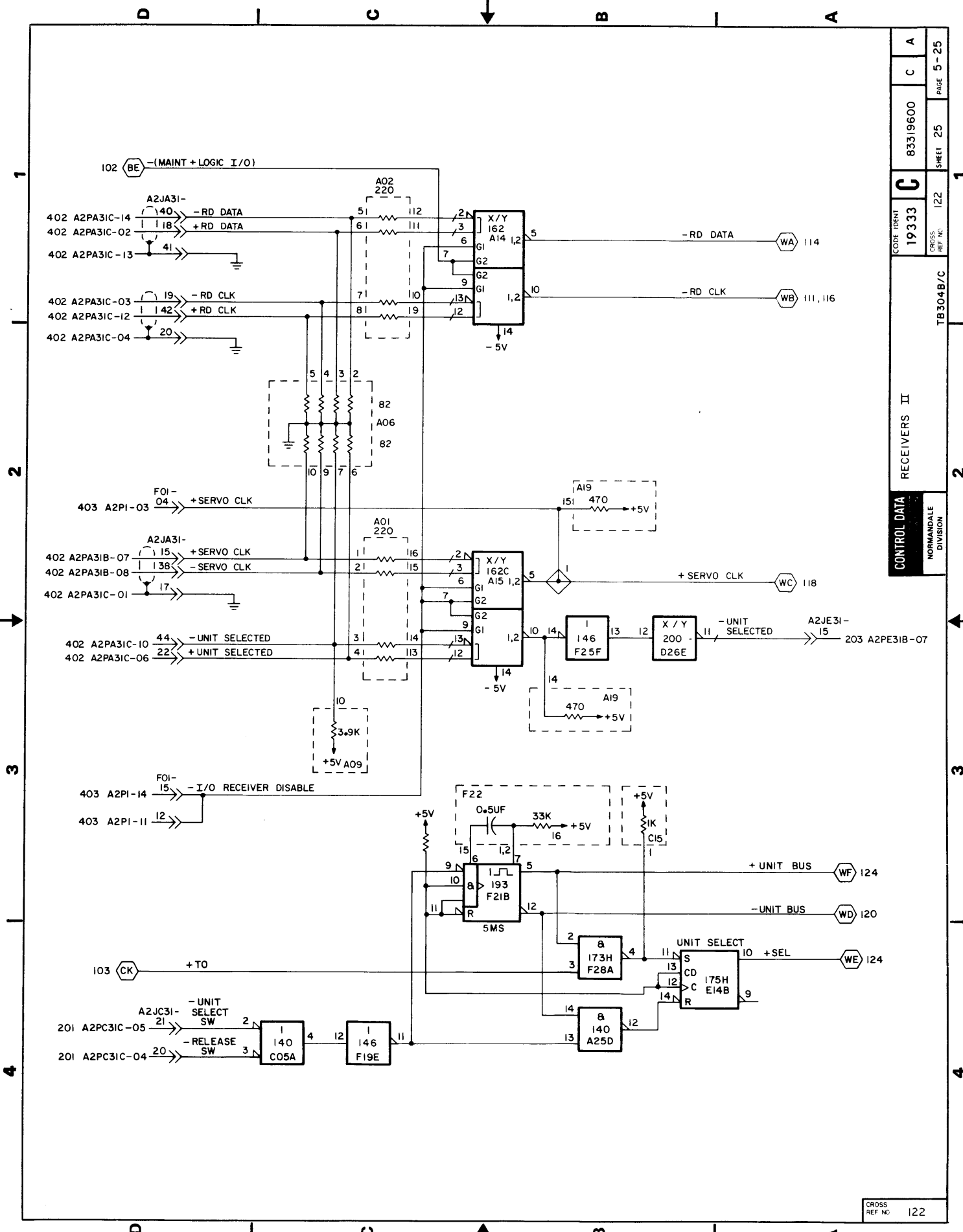
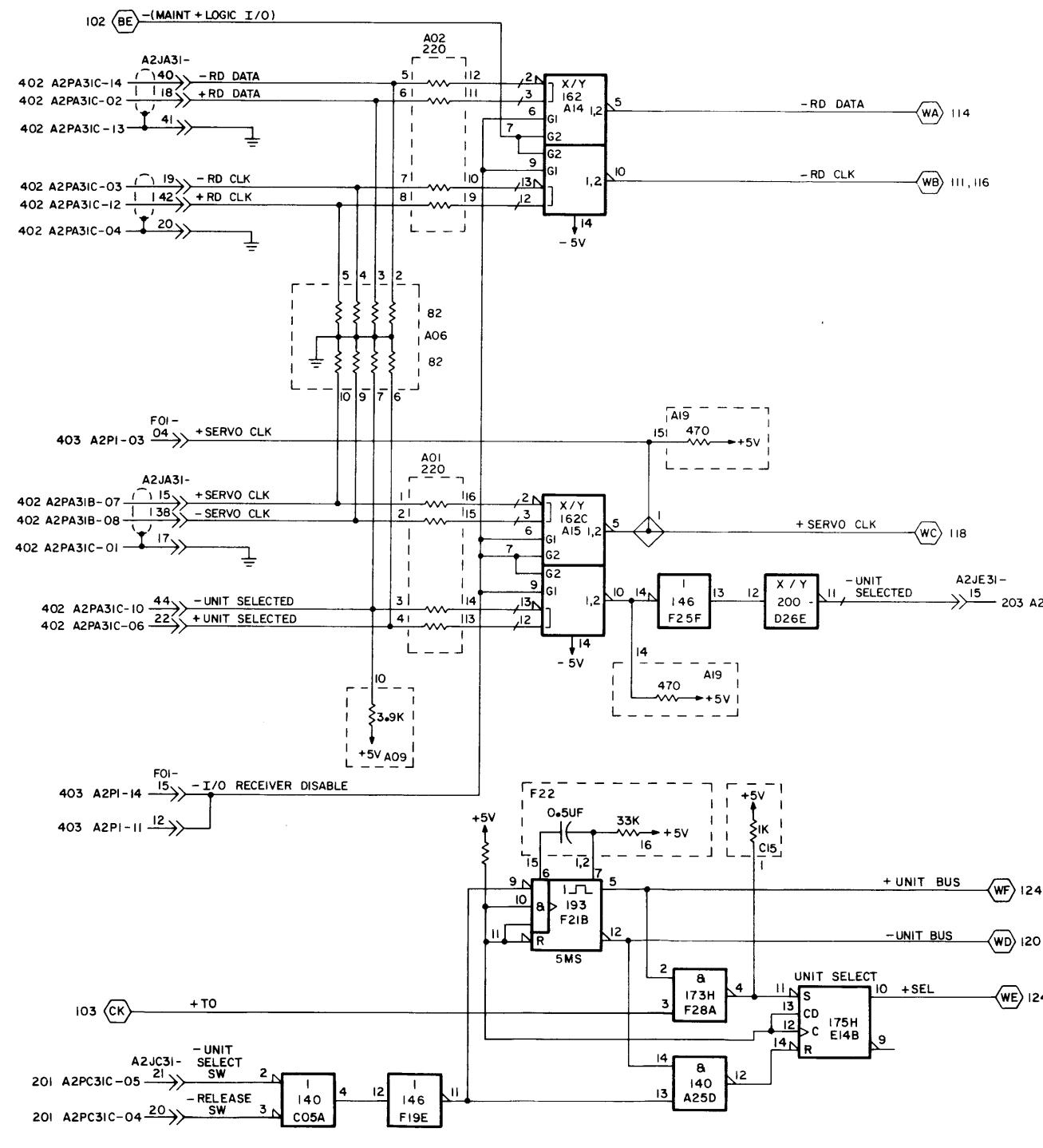
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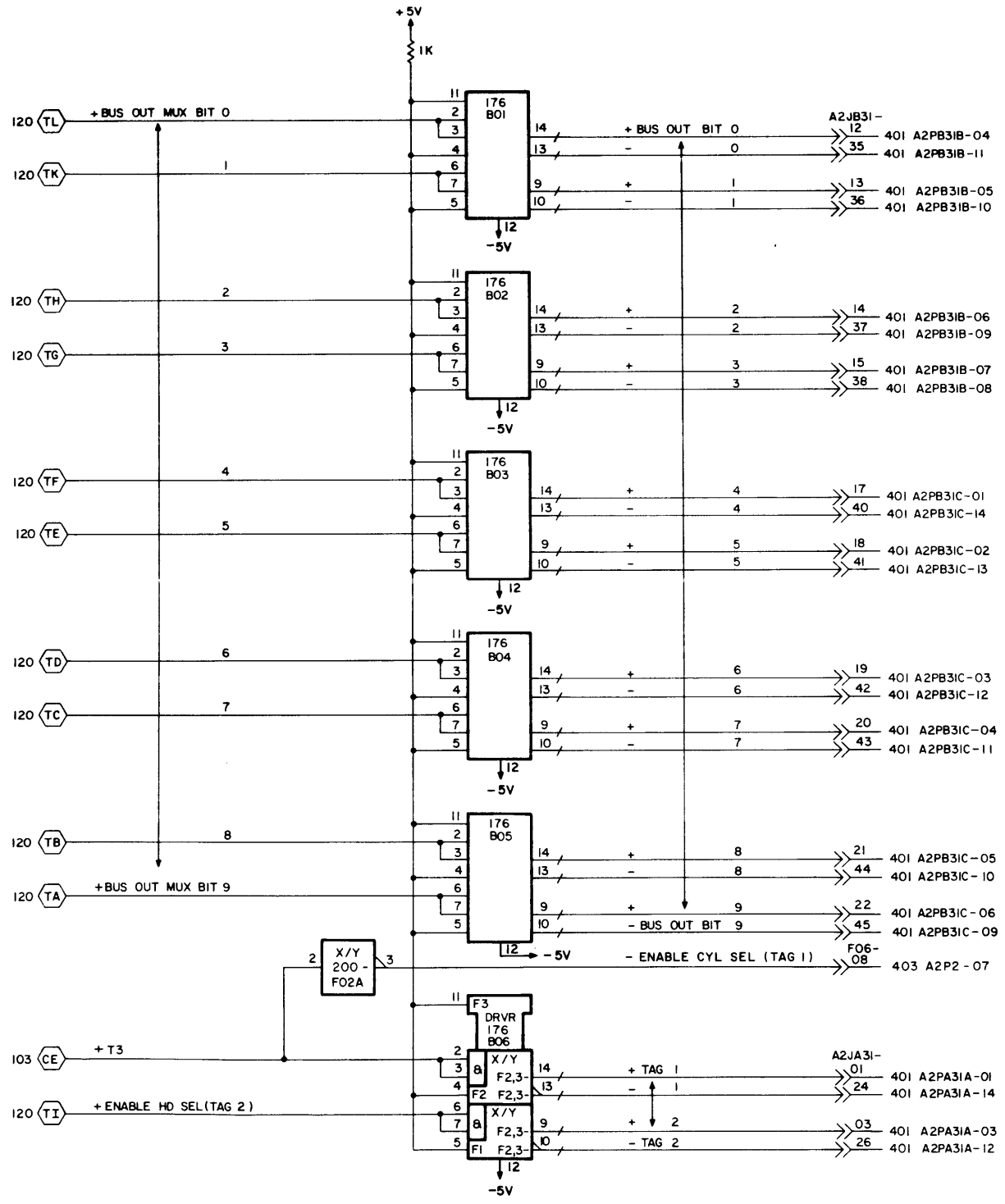
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CROSS REF NO 121



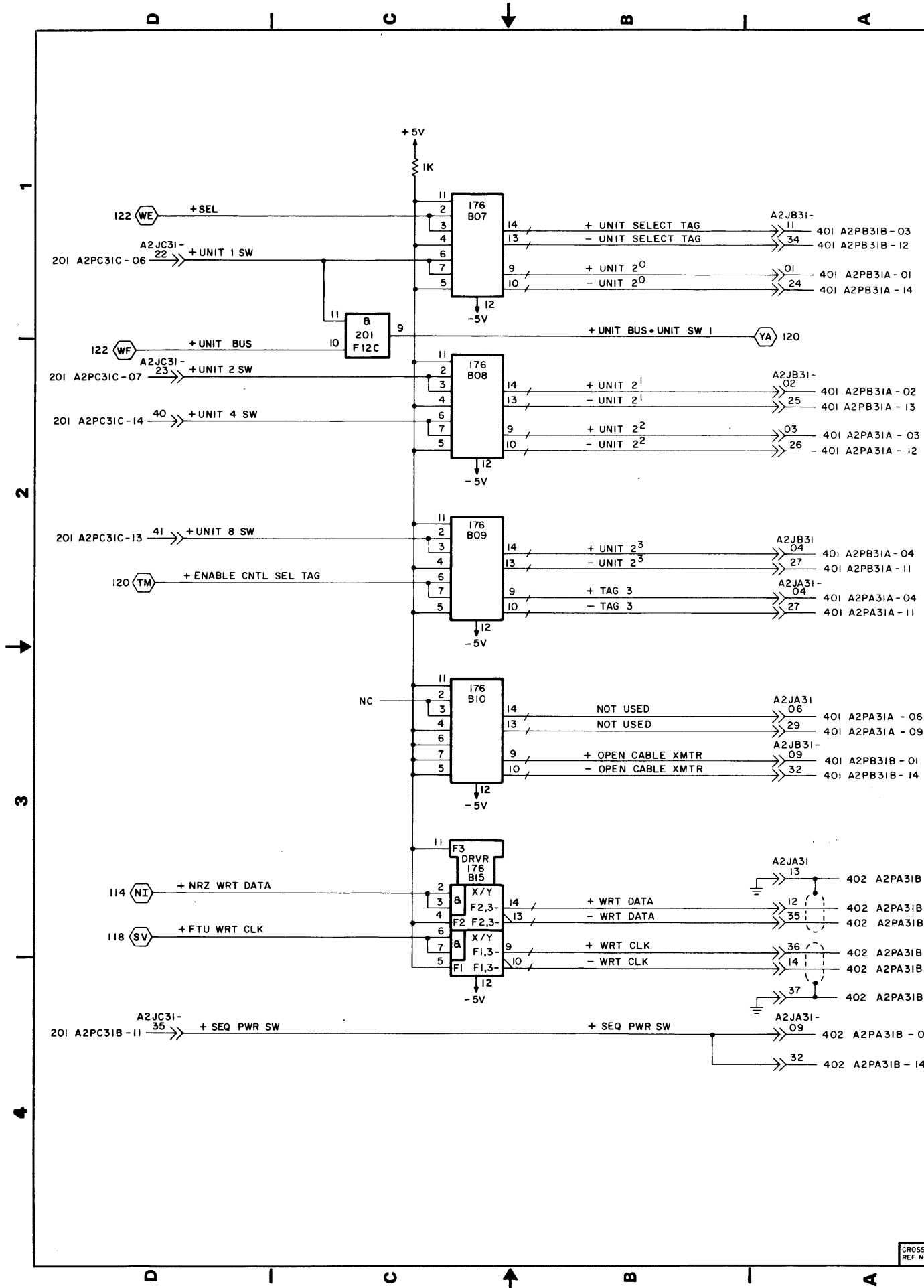
D C B A

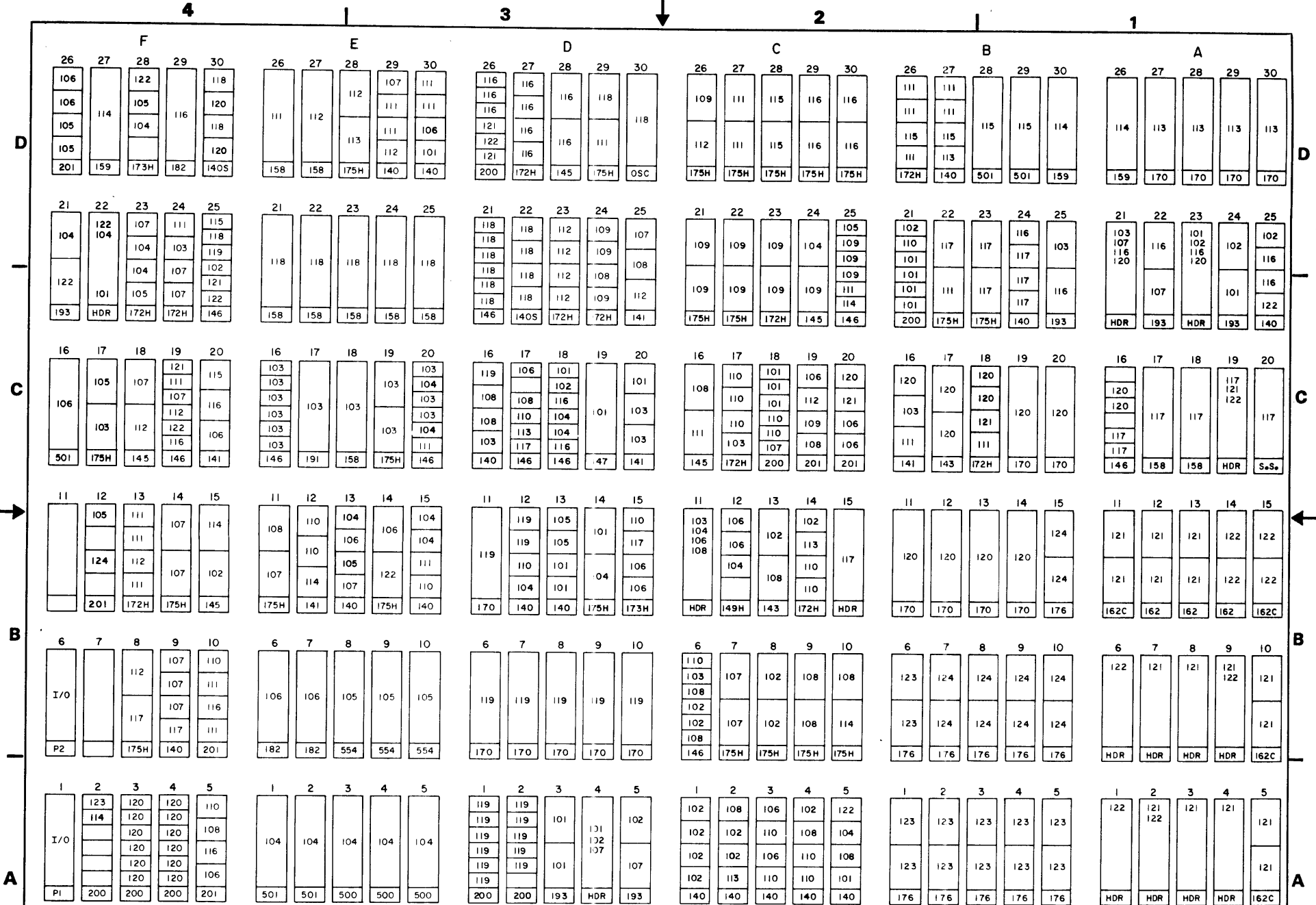
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| CODE IDENT | 83319600 | C | A |
| CROSS REF NO | 123 | SHEET | 26 |
| 19333 | | PAGE 5-26 | |
| TBS04B/C | | | |
| TRANSmitters I | | | |
| CONTROL DATA | | | |
| NORMANDEALE DIVISION | | | |

D C B A





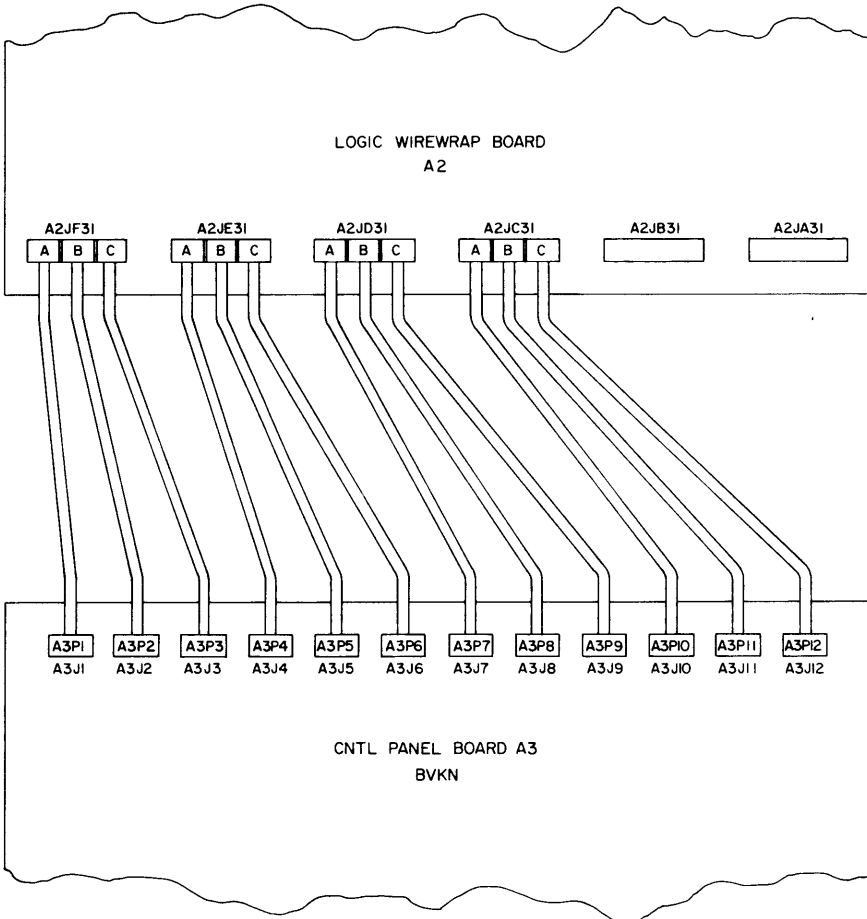
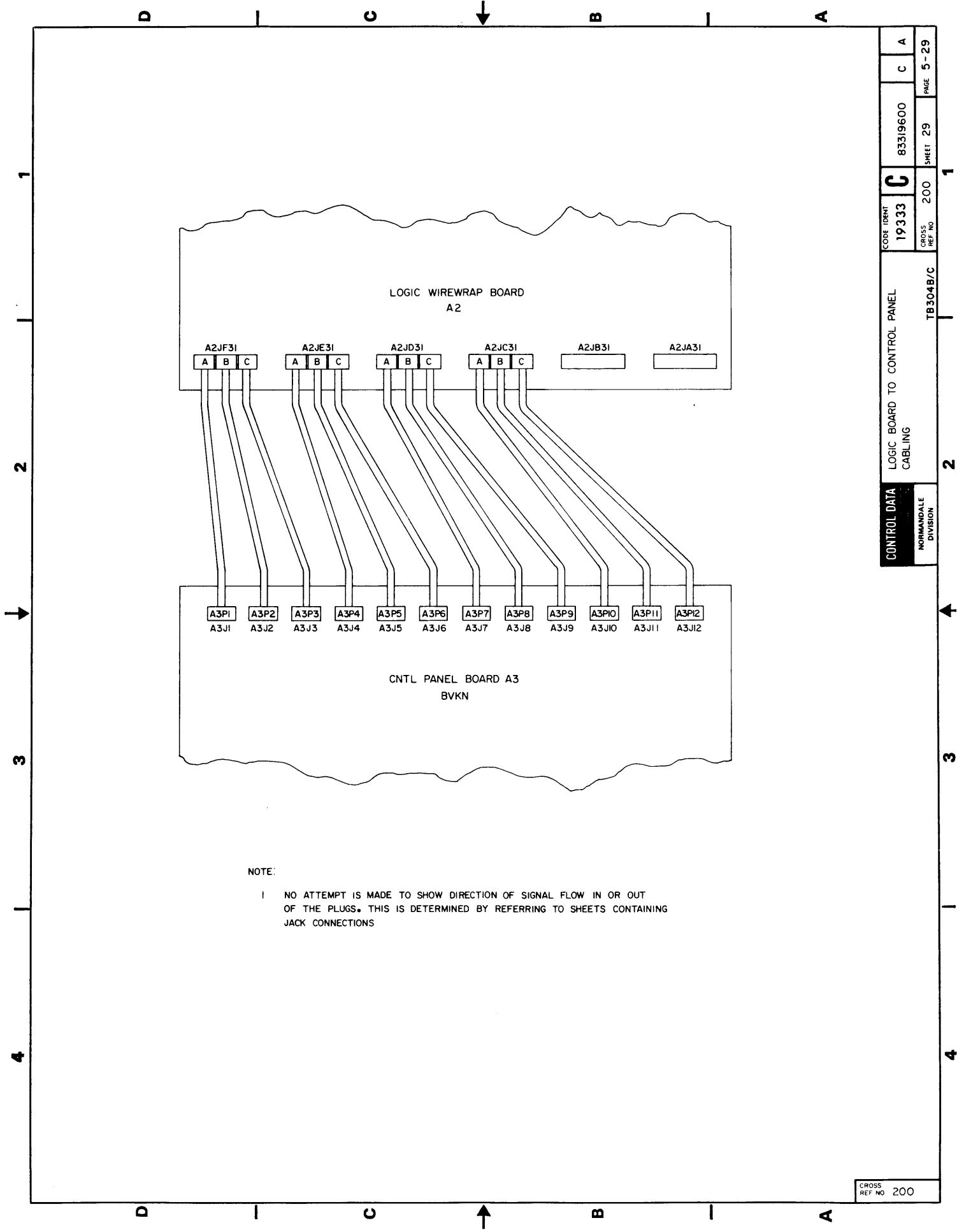
REVISED
REF NO 125

NOTES

1. BOTTOM DESIGNATION IN EACH LOCATION IS I.C. TYPE; OTHER NUMBERS ARE LOGIC DIAGRAM CROSS-REFERENCE PAGES WHERE CIRCUIT SECTION IS SHOWN.
2. LOCATIONS OR I.C. SECTIONS THAT ARE UNUSED ARE LEFT BLANK

3. MISCELLANEOUS DESIGNATIONS:
 HDR = RESISTOR HEADER
 OSC = CRYSTAL OSCILLATOR
 S.S. = SECTOR SWITCHES (8)
 I/O = I/O BYPASS CONNECTOR

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| CONTROL DATA | LOGIC BOARD | | CODE IDENT | C | 83319600 | D | B |
| | NORMANDEALE DIVISION | I.C. PLACEMENT | | | | | |
| TB304B/C | | | CROSS REF NO 125 | SHEET 28 | | PAGE 5-28 | |



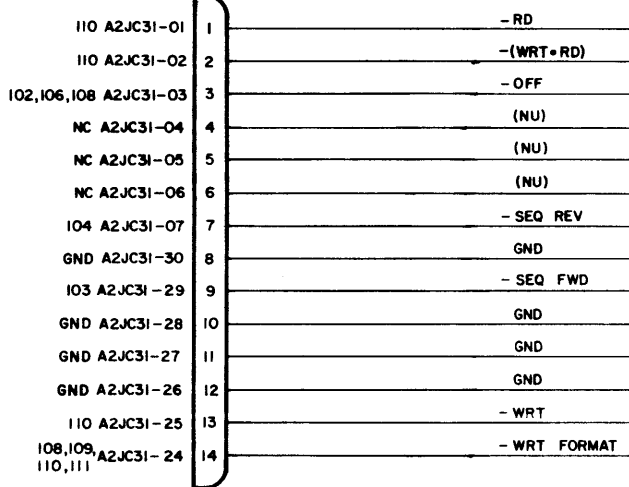
NOTE:

1 NO ATTEMPT IS MADE TO SHOW DIRECTION OF SIGNAL FLOW IN OR OUT OF THE PLUGS. THIS IS DETERMINED BY REFERRING TO SHEETS CONTAINING JACK CONNECTIONS

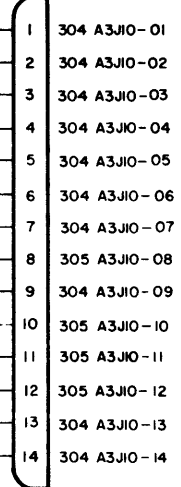
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|--------------------------------------|-----------------|-------|-------|----------|------|------|
| CONTROL DATA | CODE IDENT | 19333 | C | 83319600 | C | A |
| | SERIES REF. NO. | 200 | SHEET | 29 | PAGE | 5-29 |
| LOGIC BOARD TO CONTROL PANEL CABLING | | | | | | |
| TB304B/C | | | | | | |
| NORMAN DALE DIVISION | | | | | | |

D C B A

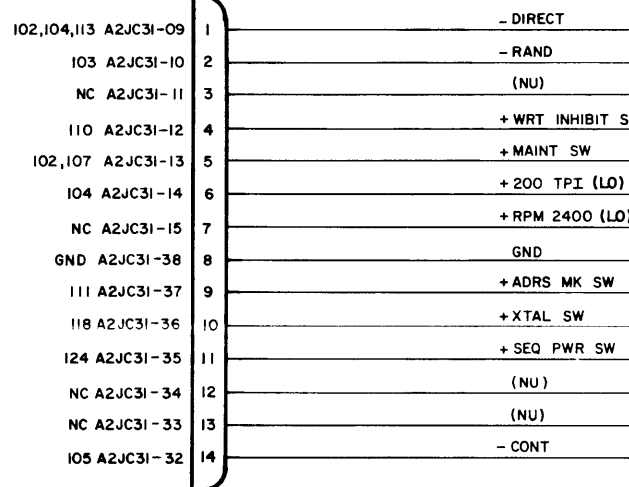
A2PC31A



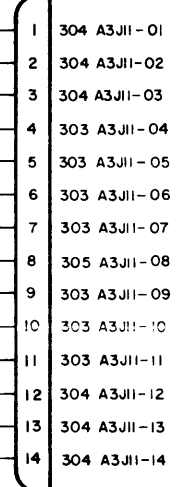
A3P10-



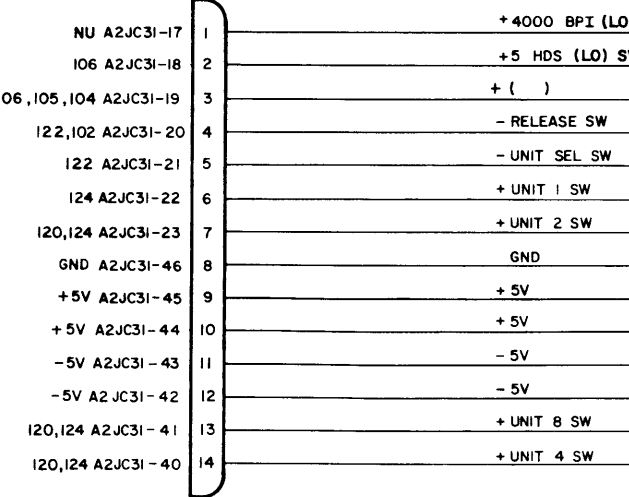
A2PC31B



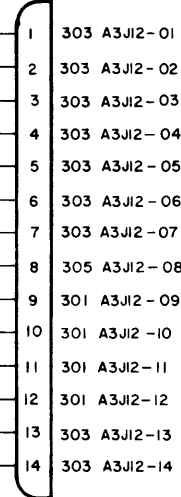
A3P11-



A2PC31C



A3P12-

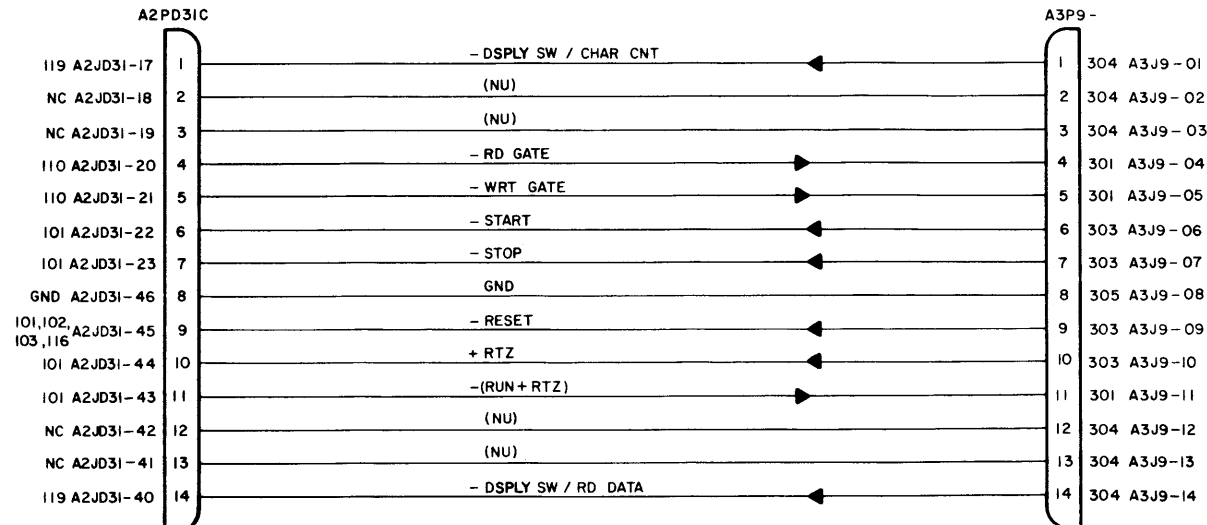
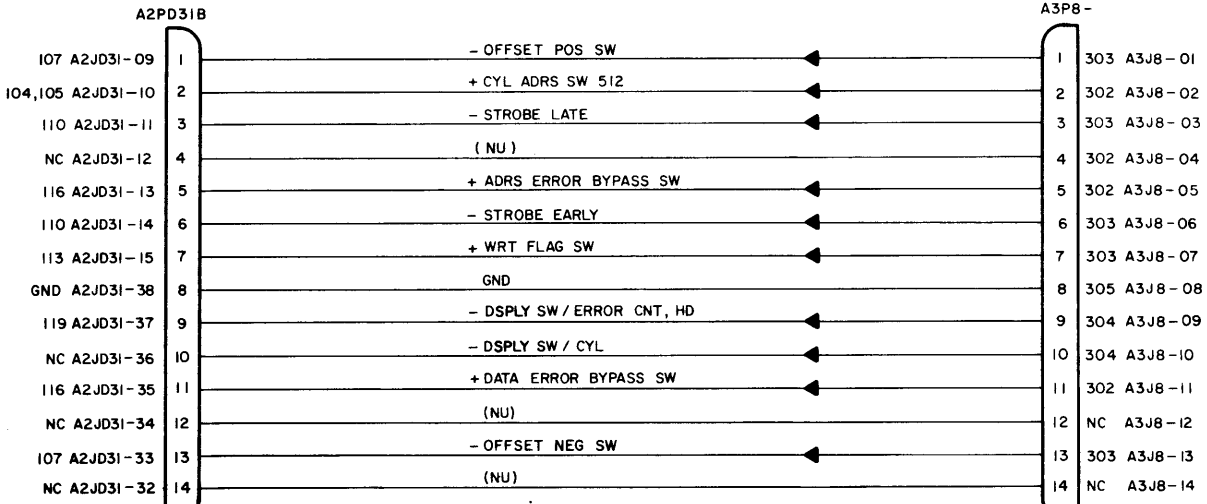
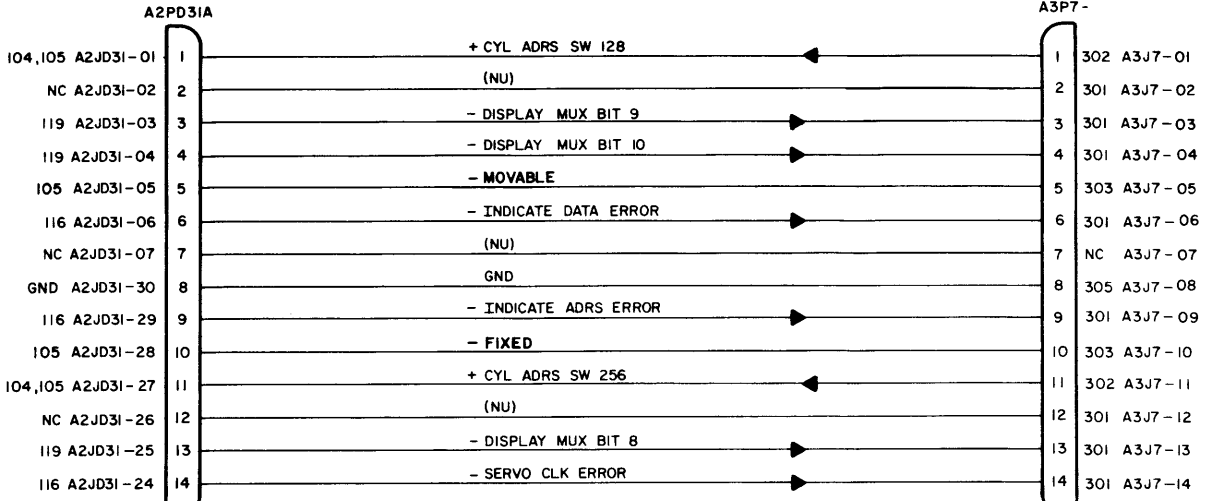


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| CODE IDENT | 19333 | C | A |
| CROSS REF NO | 201 | 83319600 | 5-30 |
| CONTROL DATA | | PAGE 5-30 | |
| LOGIC BOARD TO CNTL PANEL | | SHEET 30 | |
| CABLING JC31 TO J10,11,12 | | TB304B/C | |
| NORMANDEALE DIVISION | | | |

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D I C B A



D I C B A

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| CONTROL DATA | | CODE IDENT | D |
| LOGIC BD TO CNTL PANEL CABLING | | 19333 | B |
| J031 TO J7, B, 9 | | CROSS REF NO | 83319600 |
| NORMANVILLE DIVISION | | 202 | D |
| | | TB304B/C | SHEET 31 |
| | | | PAGE 5-31 |

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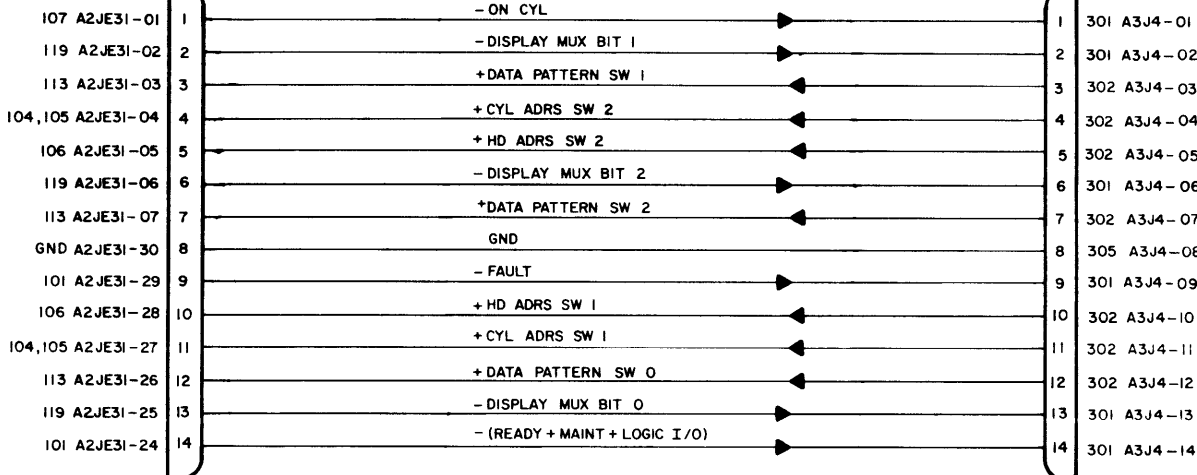
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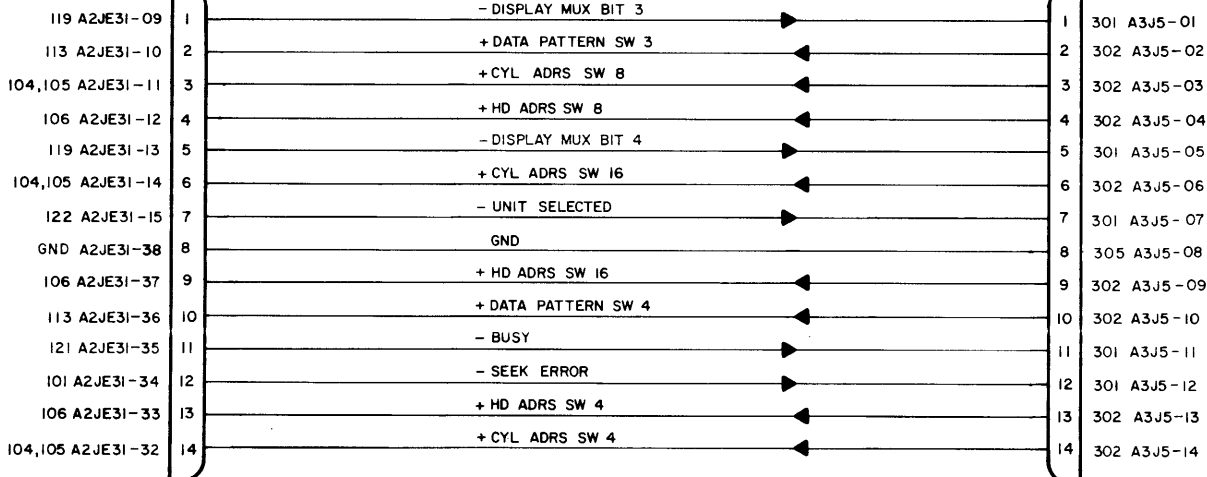
A2PE31A

A3P4-



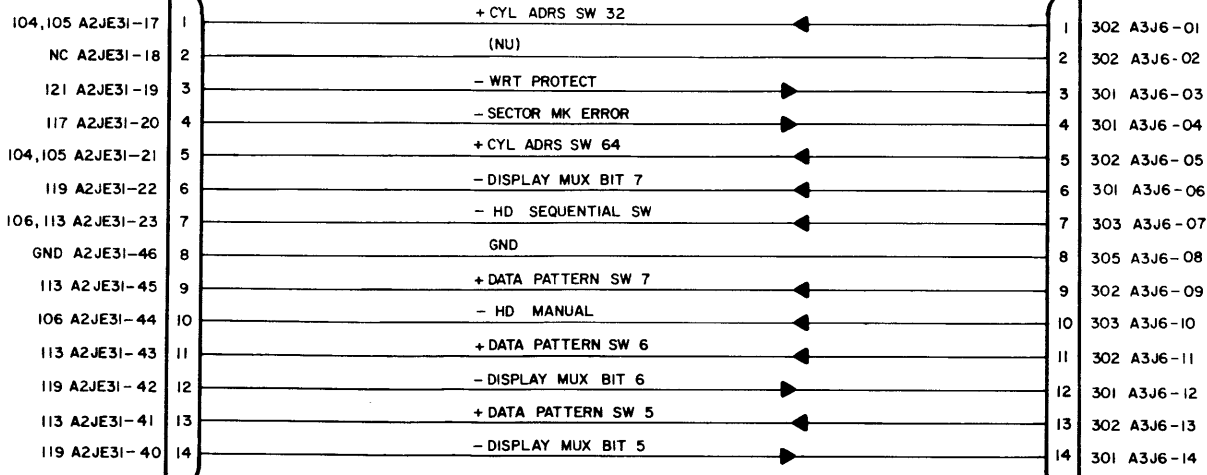
A2PE31B

A3P5-



A2PE31C

A3P6-



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| CODE IDENT | C | A |
| 19333 | 83319600 | |
| CROSS REF NO | 203 | SHEET 32 |
| PAGE 5-32 | | |
| LOGIC BD TO CNTL PANEL CABLING | | |
| JE31 TO J4,5,6 | | |
| TB304B/C | | |
| CONTROL DATA | | |
| NORMANDALE DIVISION | | |

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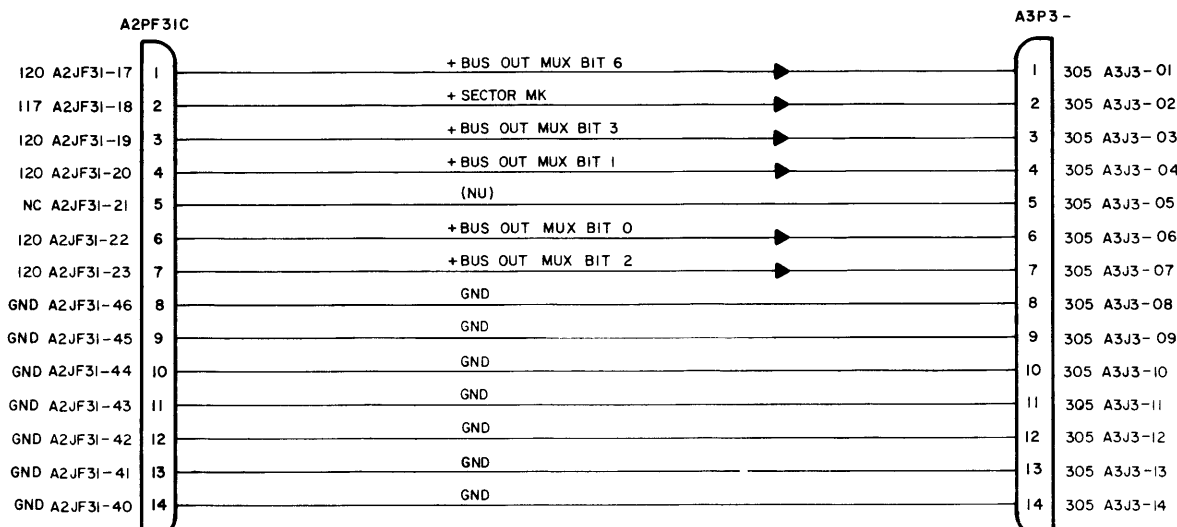
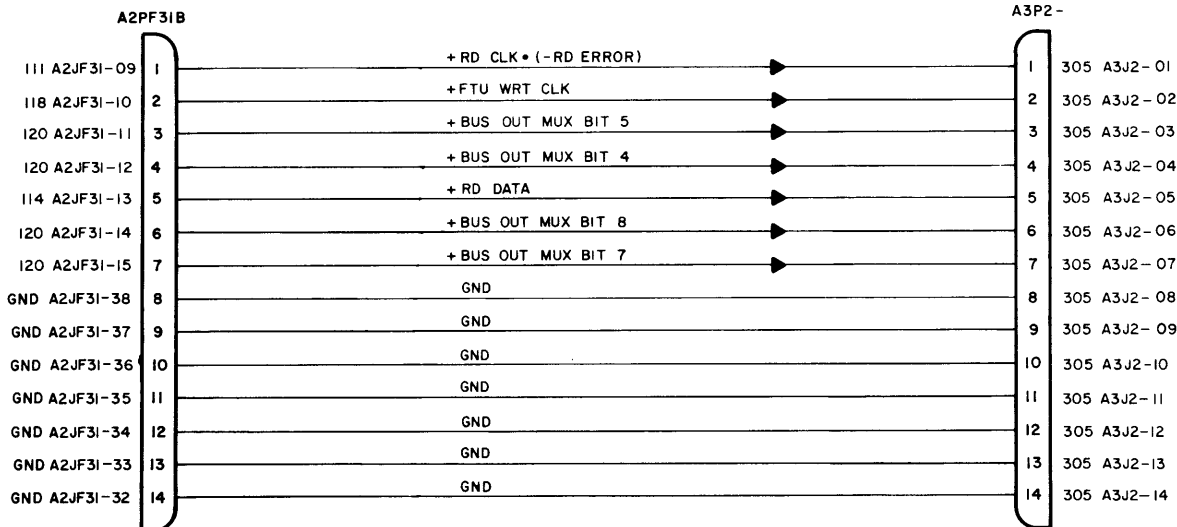
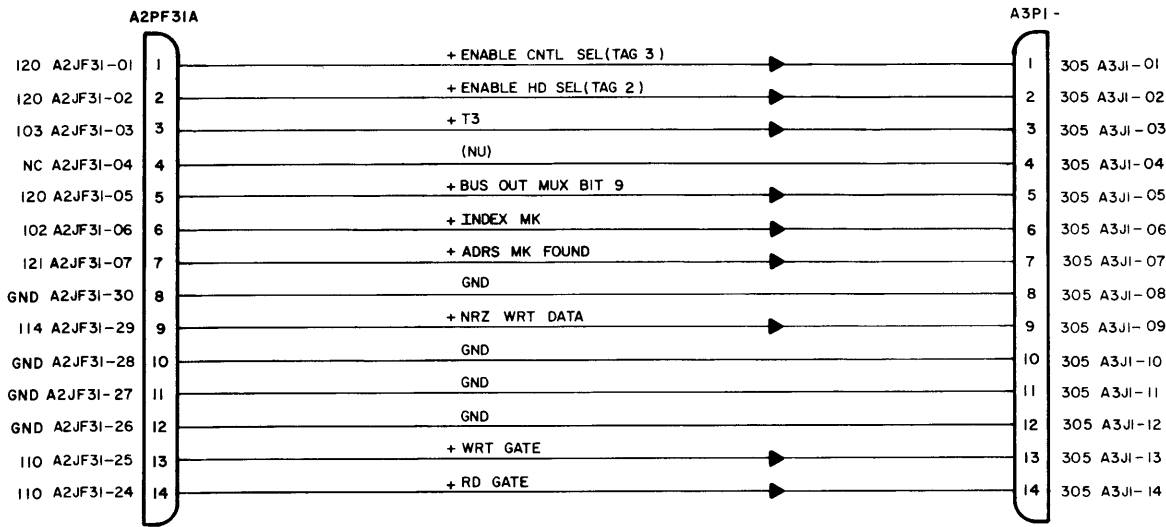
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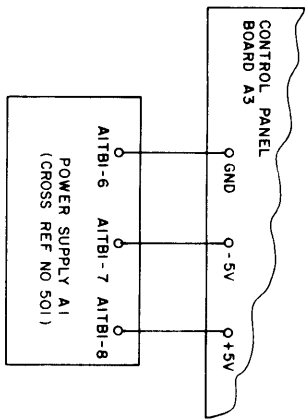
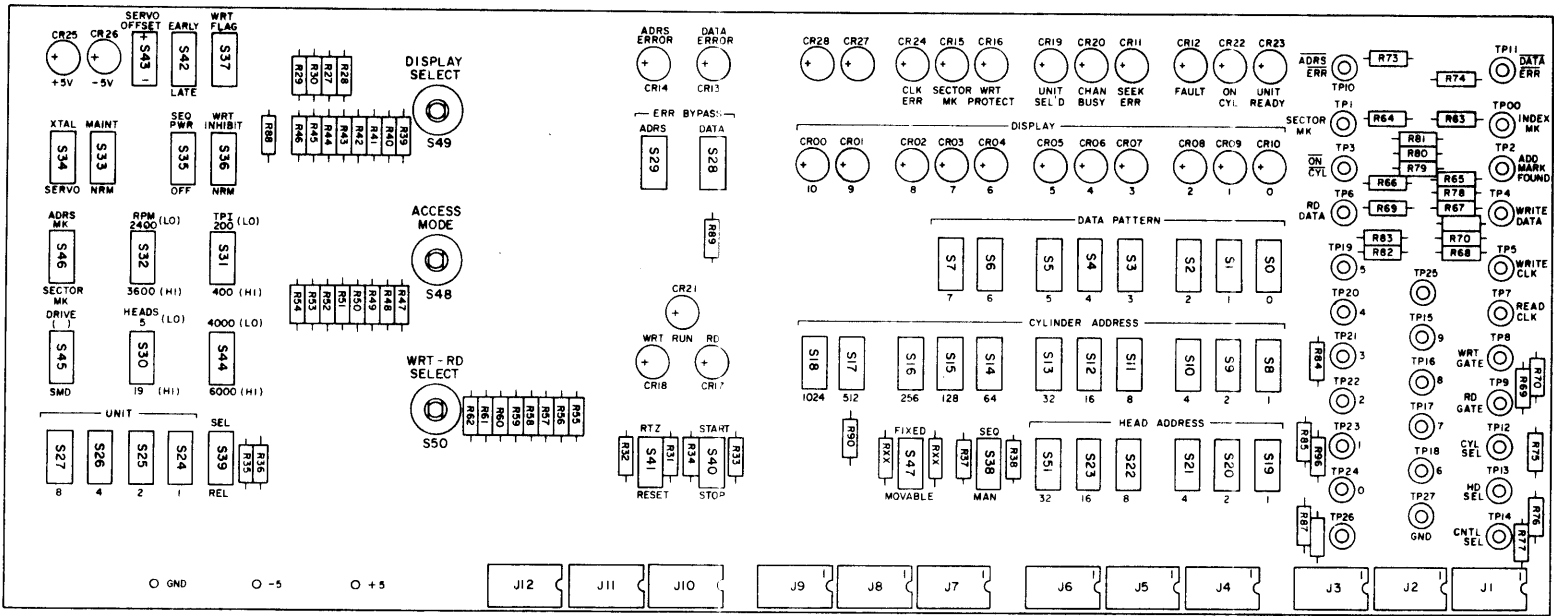
C

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| CODE IDENT | 19333 | C | A |
| CROSS REF NO | 204 | 83319600 | 5-33 |
| CONTROL DATA | | TB304B/C | |
| LOGIC BD TO CNTL PANEL CABLING | | | |
| JF31 TO J1,2,3 | | | |
| NORMANDEALE DIVISION | | | |
| SHEET 33 | | | |

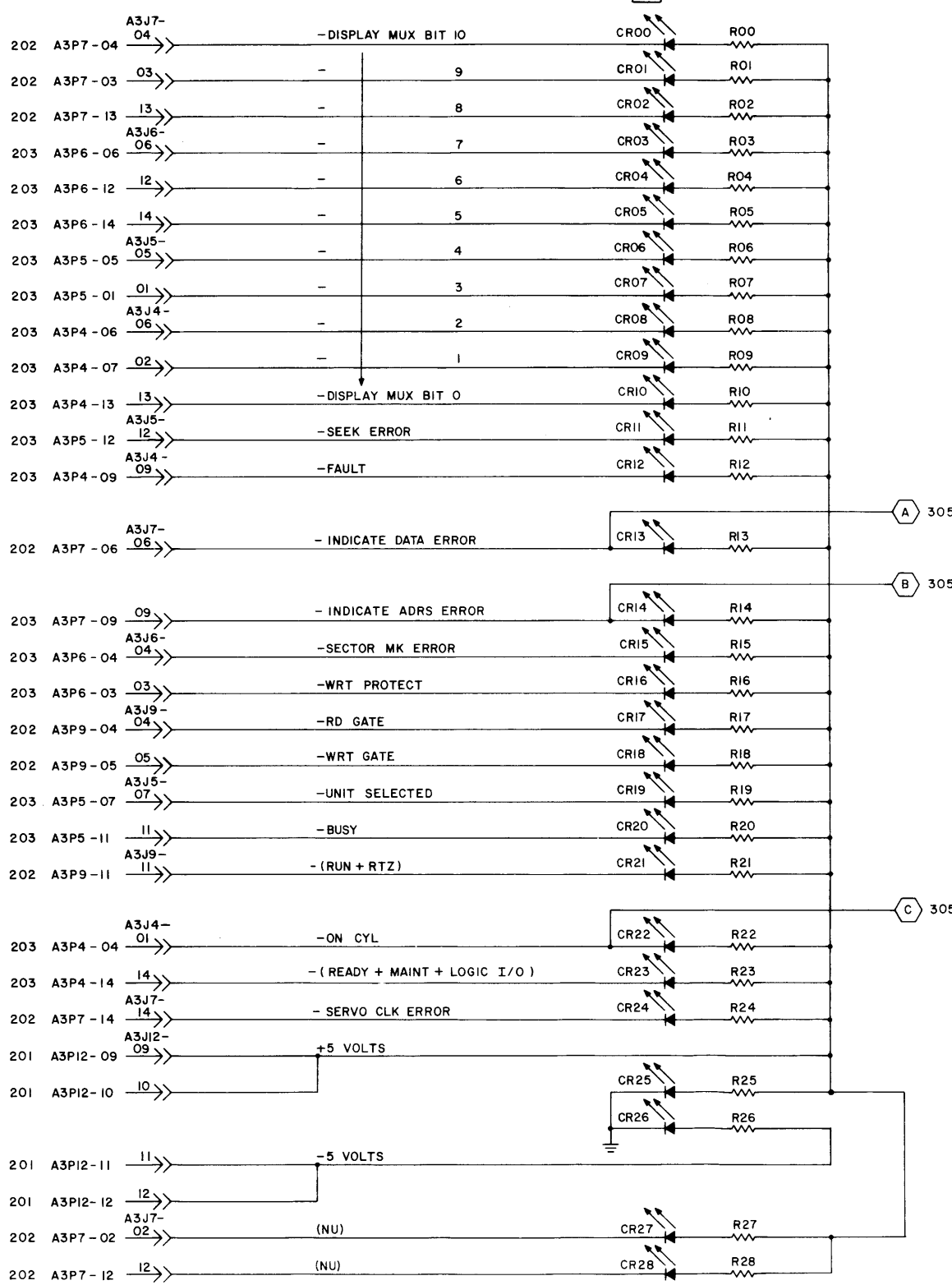


NOTES:

1. THESE ELEMENTS ARE NOT INSTALLED ON PC BOARD
2. RESISTORS R02 THRU R26 ARE PART OF THEIR ASSOCIATED LED (CRO2 THRU CR26)
3. REFER TO CROSS REF NO 200 FOR CABLES CONNECTING CNTRL PANEL TO LOGIC BOARD
4. POWER AND GROUND CONNECTIONS

| | | | | | | | |
|-----------------------------------------|---------------|--|----------------------------|----------|-----------|---|---|
| CONTROL DATA NORMANDEALE DIVISION | CONTROL PANEL | | CODE IDENT 19333 | C | 83319600 | C | A |
| | T8304B/C | | CROSS REF NO 300 | SHEET 34 | PAGE 5-34 | | |

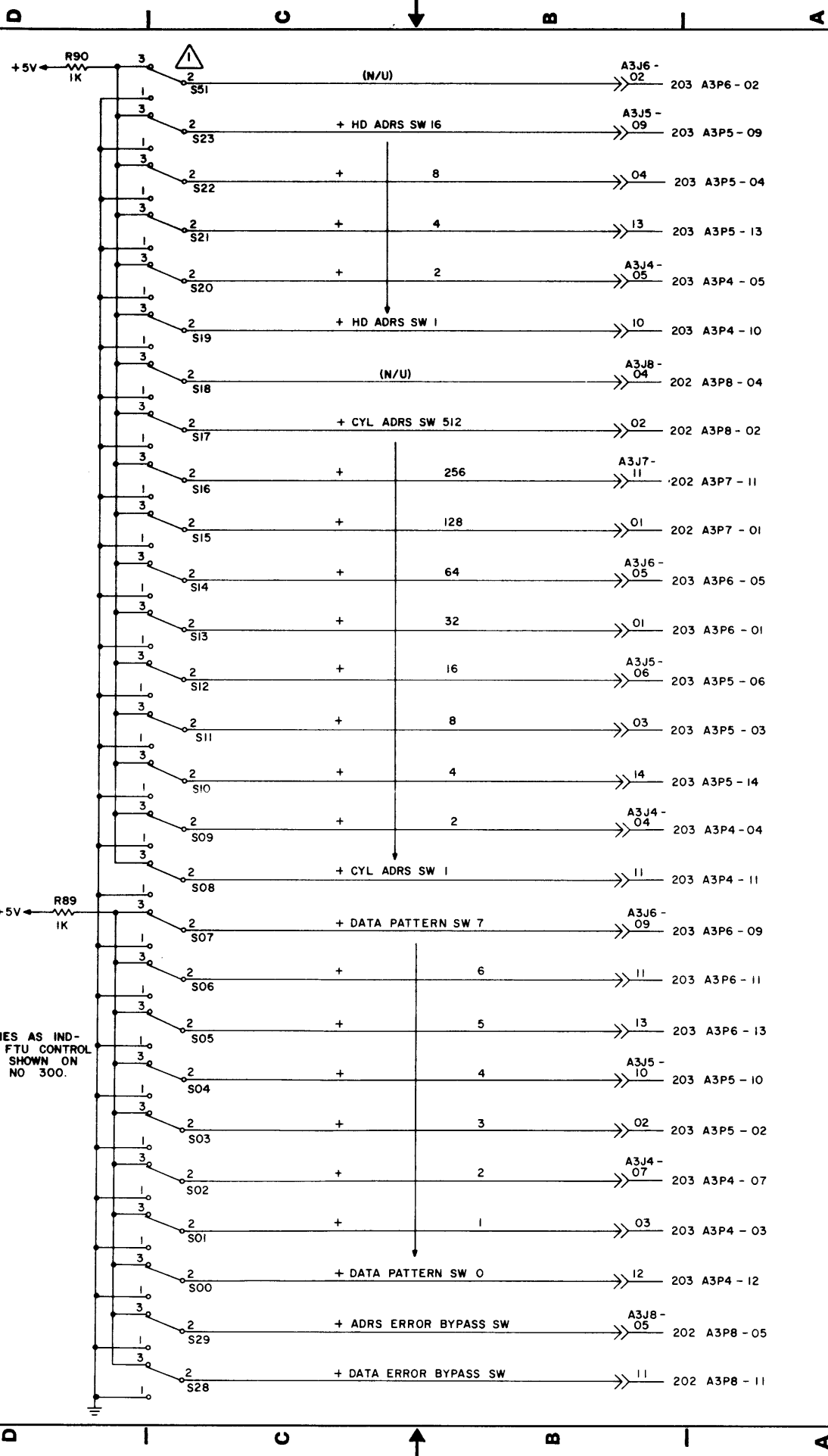
CROSS REF NO 300



NOTES

- INDICATOR NAMES AS SHOWN ON FTU CONTROL PANEL ARE INDICATED ON CROSS REF. NO. 300.
- RESISTORS R02 THROUGH R26 ARE PART OF THEIR ASSOCIATED LED (CR02 THRU CR26).

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| CODE IDENT | 83319600 | C | A |
| CROSS REF. NO. | 301 | SHEET | 35 |
| PAGE 5-35 | | | |
| CONTROL PANEL INDICATORS (LEDS) | | | |
| TB304B/C | | | |
| NORMANDALE DIVISION | | | |

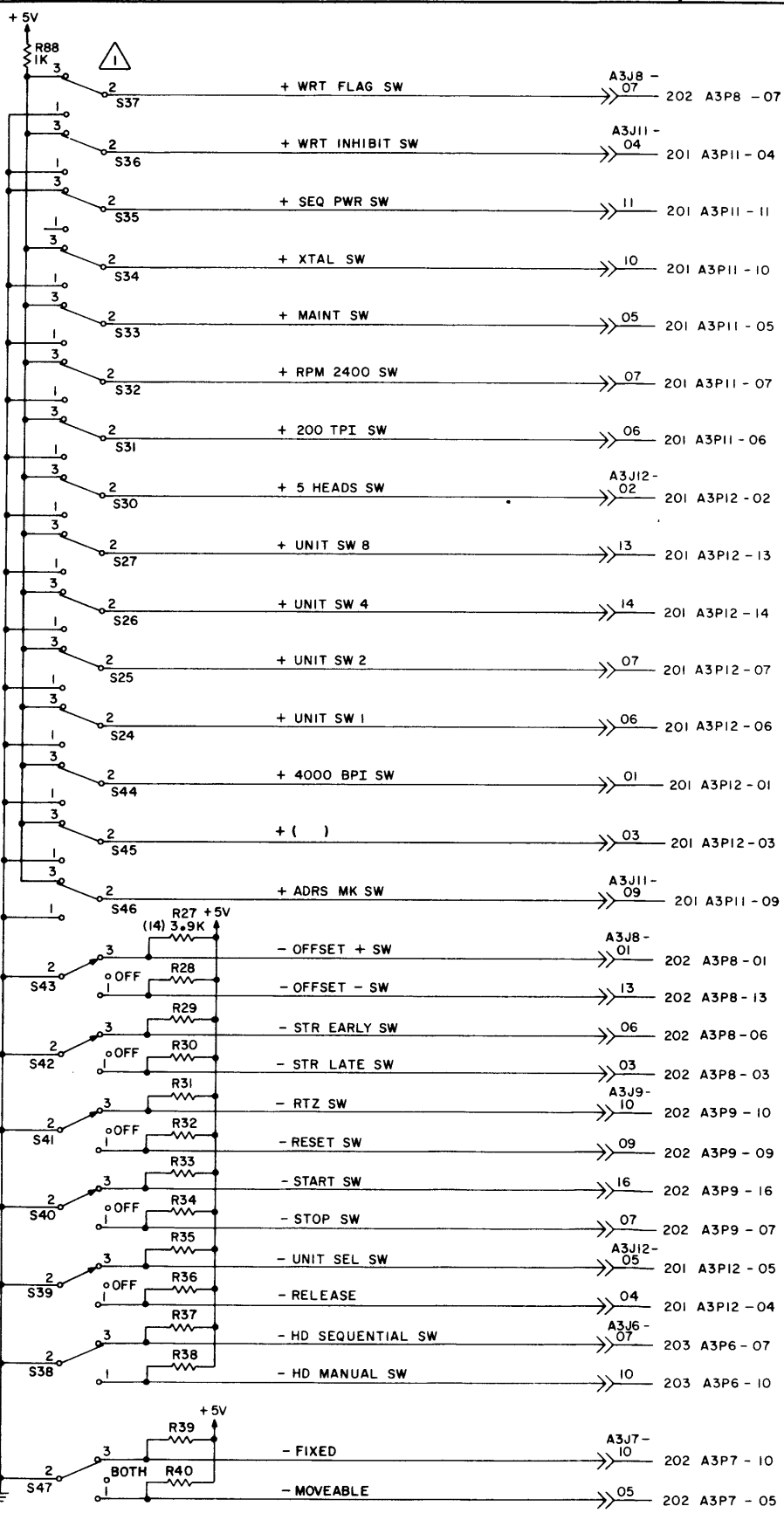


NOTES:
 1 SWITCH NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

| | | | |
|-----------------------|--------------|------------------|----------|
| CONTROL DATA | CODE IDENT | 83319600 | SHEET 36 |
| | 19333 | 302 | |
| | CROSS REF NO | TB304B/C | |
| CNTL PANEL SWITCHES I | | 5-36 | |
| NORMAN DALE DIVISION | | CROSS REF NO 302 | |

CROSS REF NO 302

D C B A

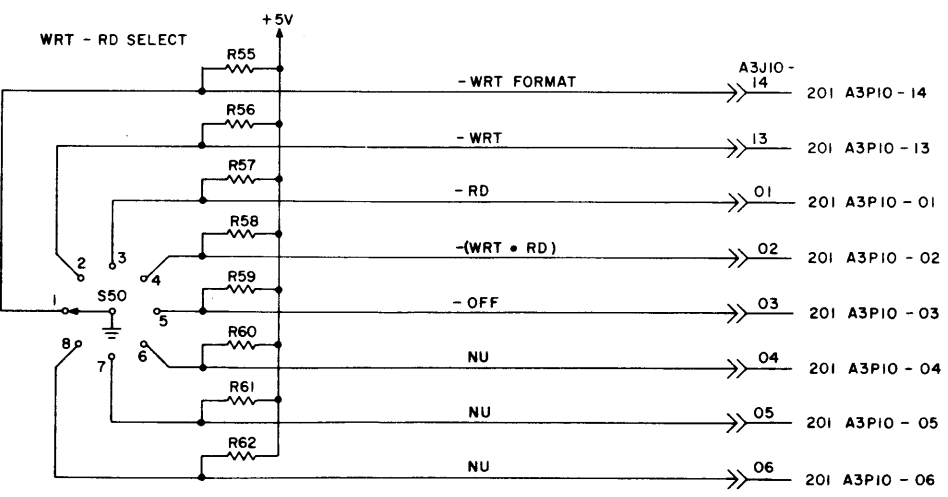
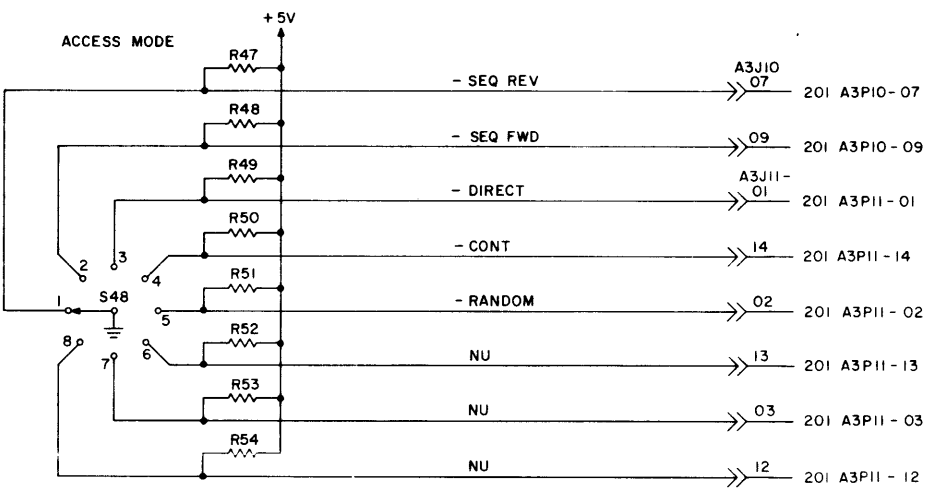
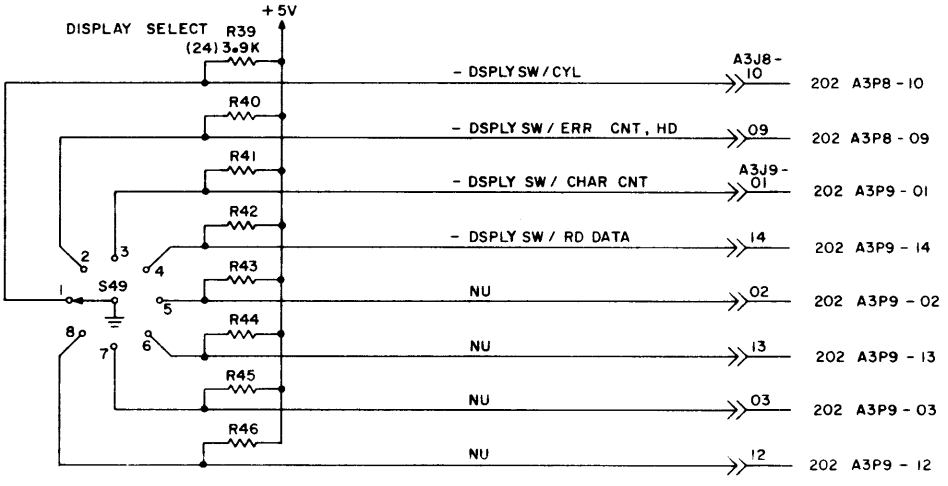


NOTES:
 1 SWITCH NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

| | | | |
|------------------------|----------|----|------|
| CODE IDENT | 83319600 | C | A |
| CROSS REF NO | 19333 | C | A |
| SHEET | 303 | 37 | 5-37 |
| CONTROL DATA | | | |
| NORMANDALE DIVISION | | | |
| CNTL PANEL SWITCHES II | | | |
| TB304B/C | | | |

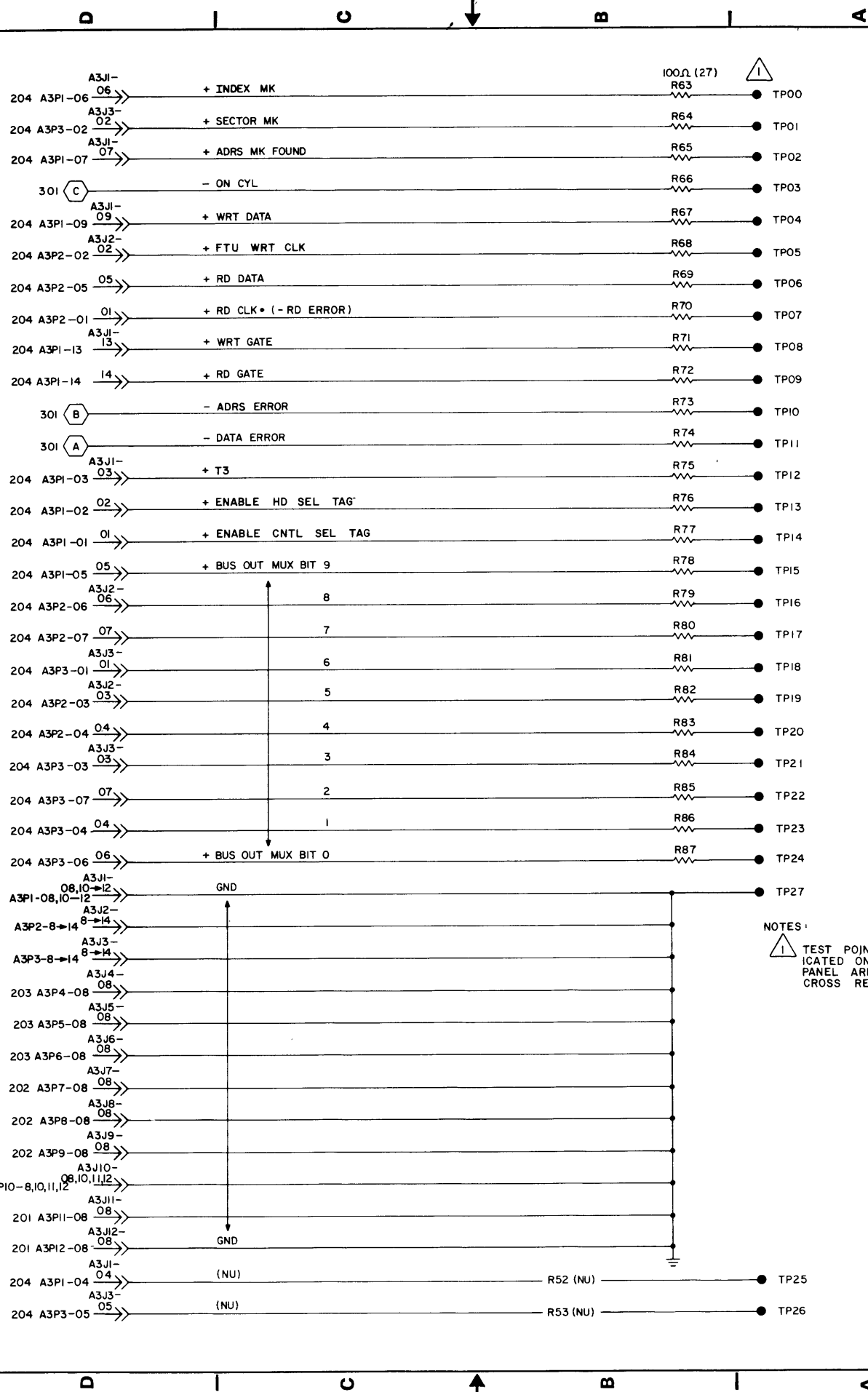
D C B A

D I C B I A



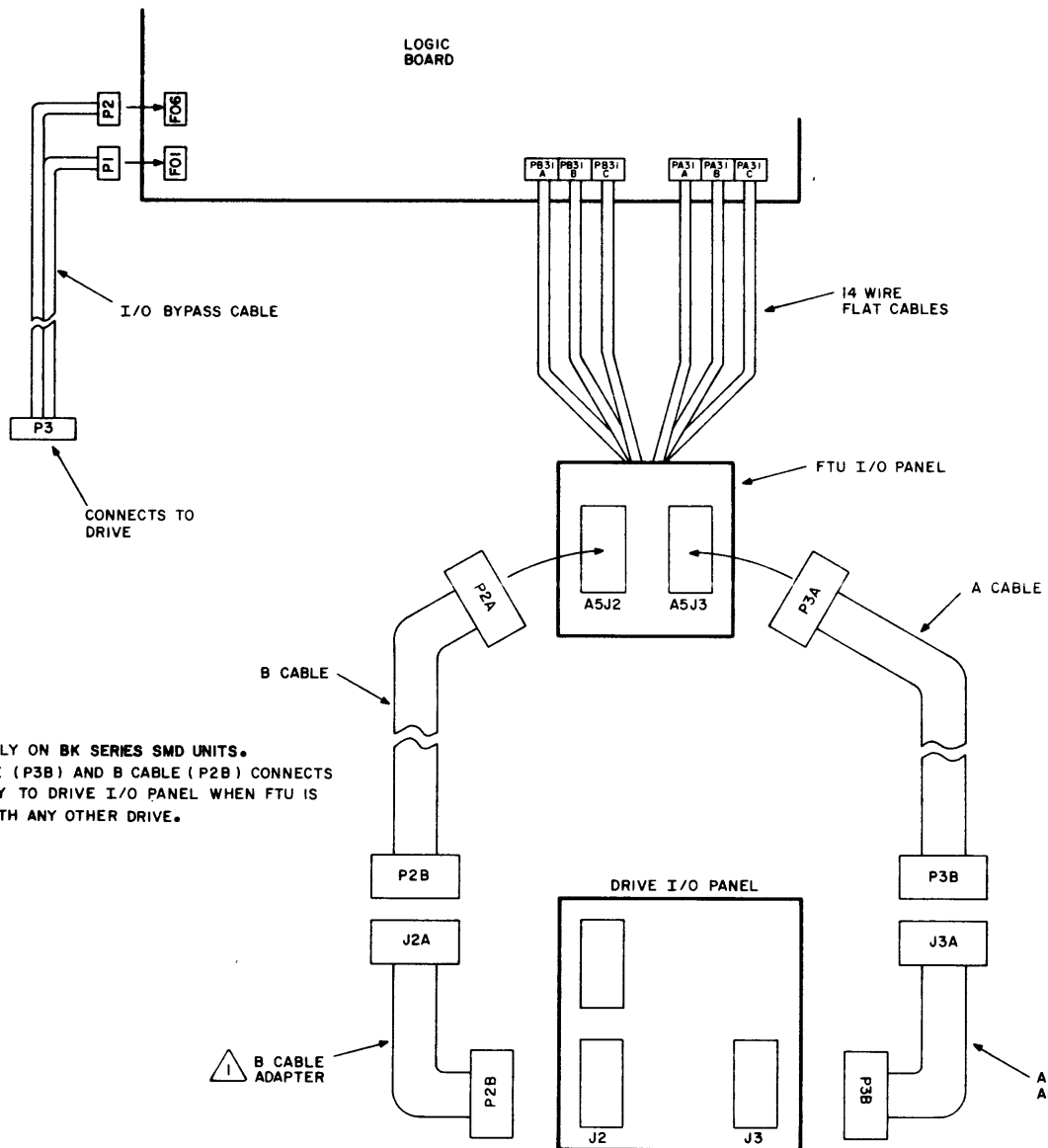
D I C B I A

| | | | |
|-------------------------|--------------|----------|-------------|
| CONTROL DATA | CODE IDENT | 83319600 | PAGE 5 - 38 |
| | 19333 | | |
| NORMANDEALE DIVISION | CROSS REF NO | TB304B/C | SHEET 38 |
| | 304 | | |
| CNTL PANEL SWITCHES III | | | |



NOTES:
 1 TEST POINT NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

| | | | |
|------------------------|----------|-------------|---|
| CODE IDENT | 83319600 | C | A |
| CROSS REF NO | 305 | PAGE 5 - 39 | |
| SHEET 39 | | | |
| TB304B/C | | | |
| CNTL PANEL TEST POINTS | | | |
| CONTROL DATA | | | |
| NORMANDE DIVISION | | | |

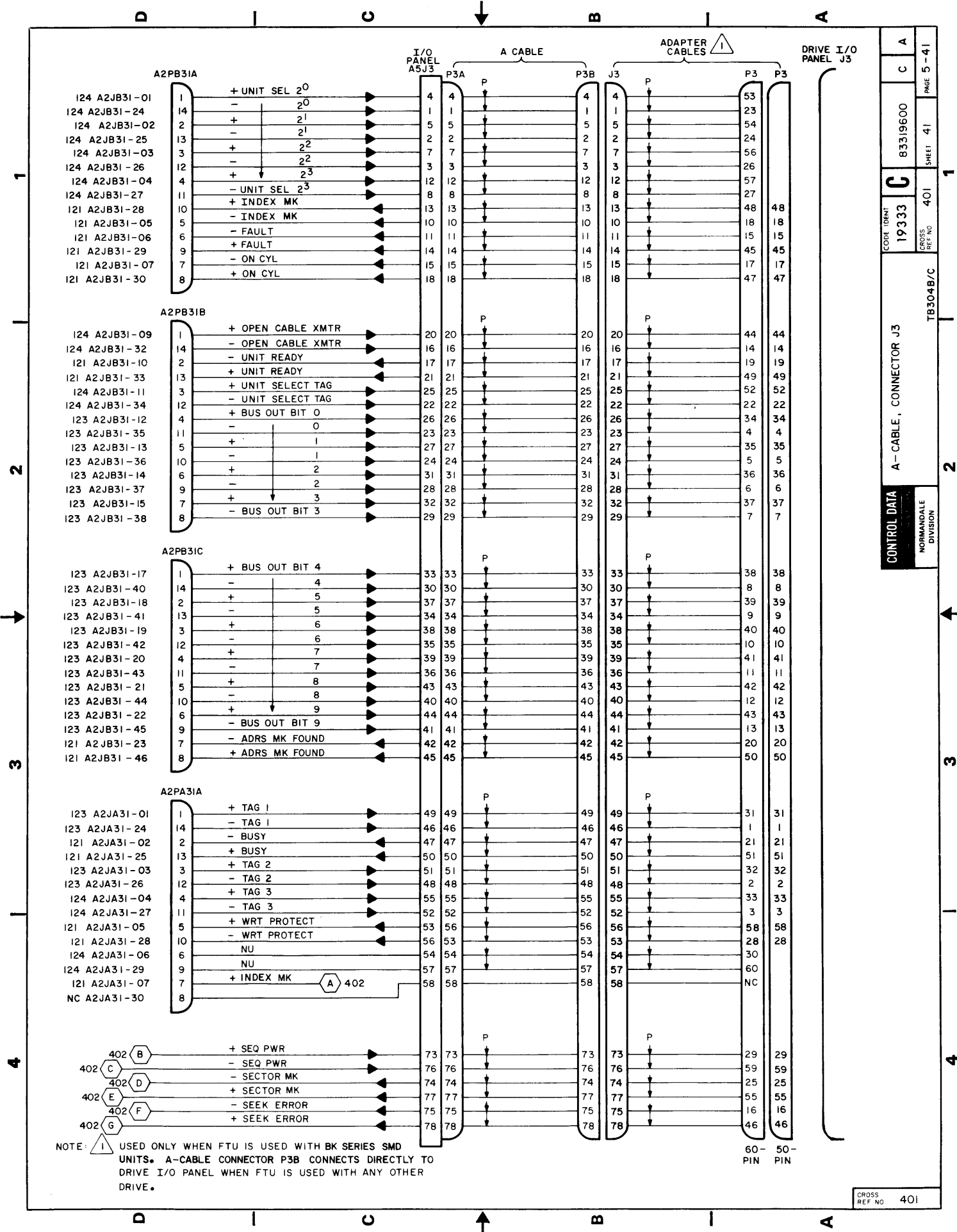


NOTES:

⚠ USED ONLY ON BK SERIES SMD UNITS.
 A CABLE (P3B) AND B CABLE (P2B) CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

⚠ B CABLE ADAPTER

A CABLE ADAPTER ⚠



NOTE: USED ONLY WHEN FTU IS USED WITH BK SERIES SMD UNITS. A-CABLE CONNECTOR P3B CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

CONTROL DATA
NORMANDALE DIVISION
A - CABLE, CONNECTOR J3
TB304B/C

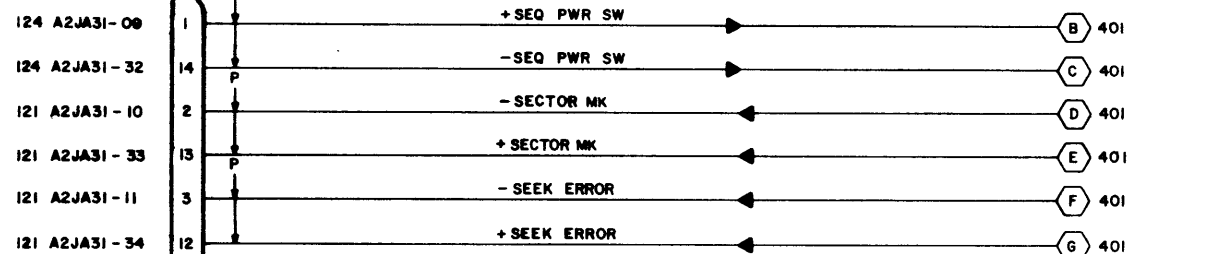
CODE IDENT 19333
GROSS REF NO 401
83319600
SHEET 41
PAGE 5-41

D C B A

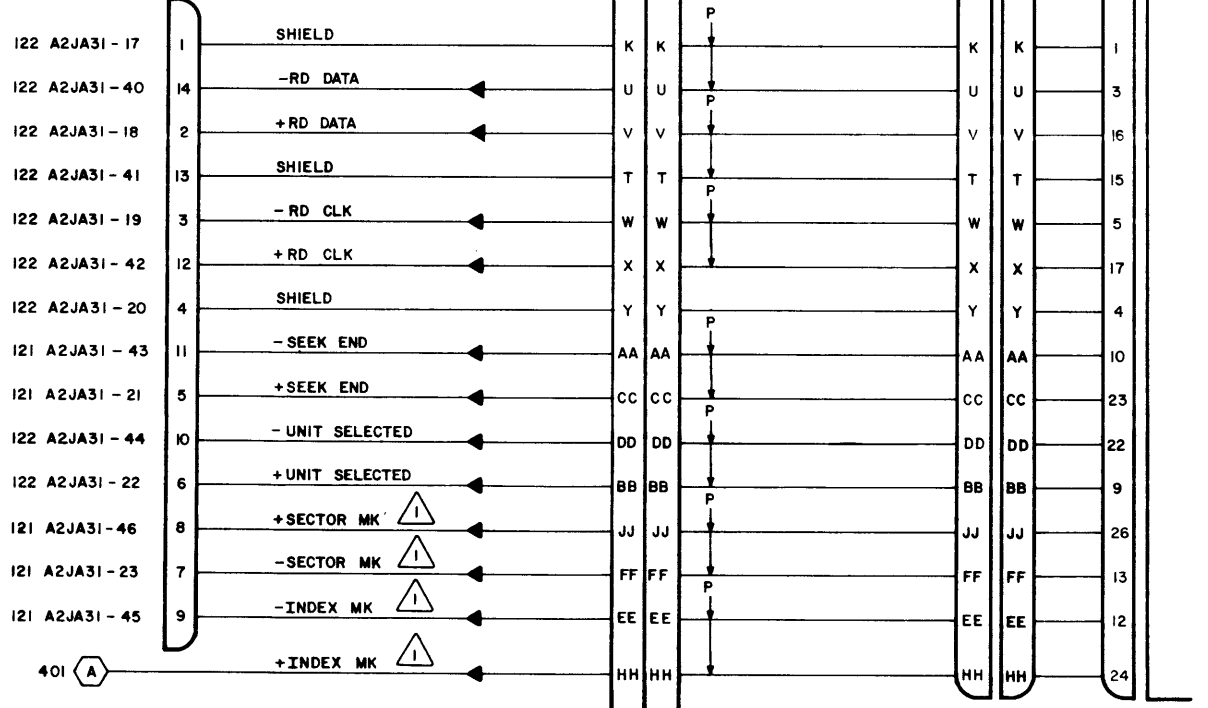
| | | | |
|-----------------------|----------|----------------------|-----|
| CODE IDENT | 19333 | CROSS REF NO | 402 |
| C | 83319600 | SHEET | 42 |
| CONTROL DATA | | TB304B/C | |
| B CABLE, CONNECTOR J2 | | NORMANDEALE DIVISION | |

| | | | |
|-----------------------|----------|----------------------|-----|
| CODE IDENT | 19333 | CROSS REF NO | 402 |
| C | 83319600 | SHEET | 42 |
| CONTROL DATA | | TB304B/C | |
| B CABLE, CONNECTOR J2 | | NORMANDEALE DIVISION | |

A2PA31B



A2PA31C



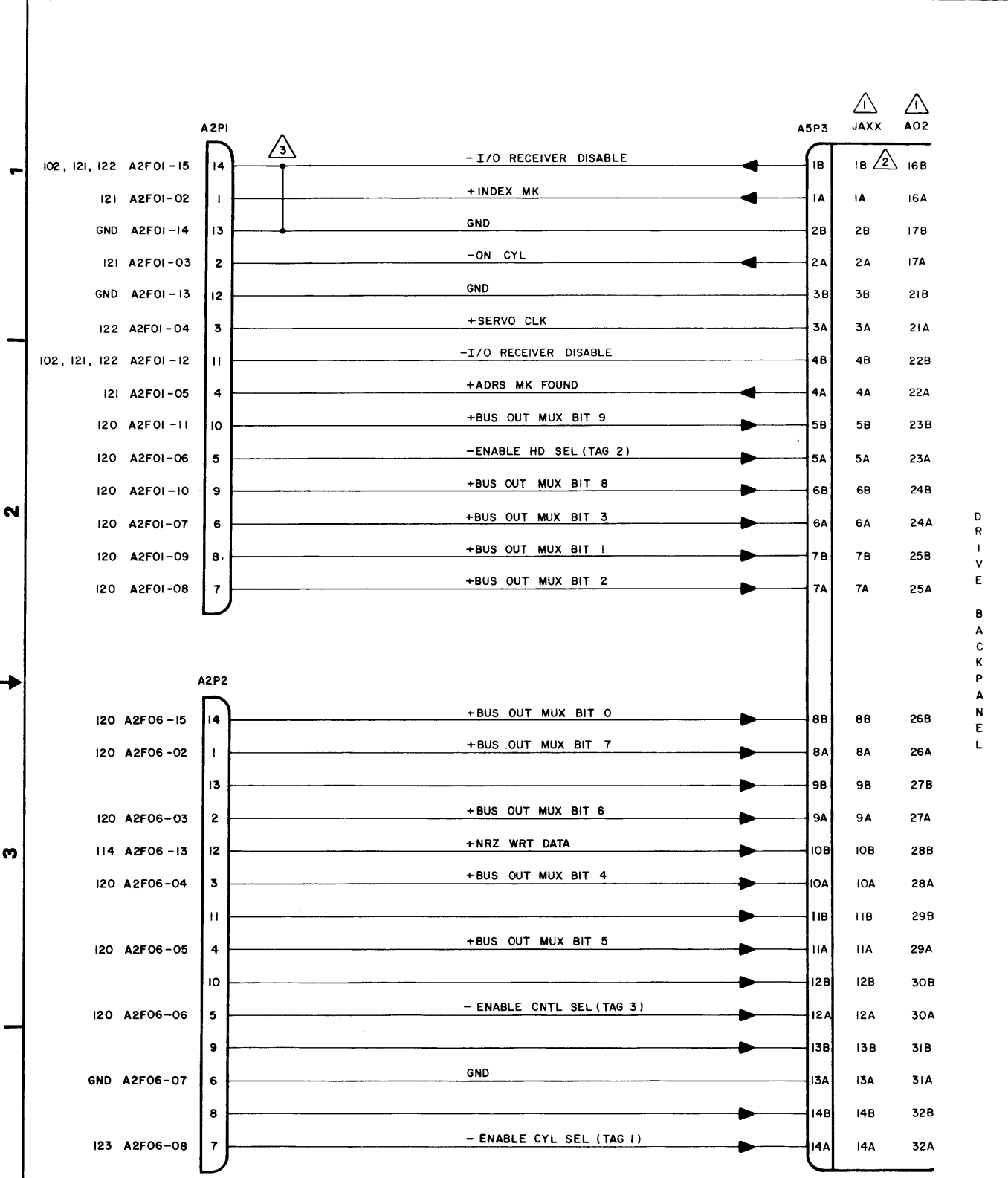
NOTES:
 ⚠ USED ONLY WHEN FTU IS USED WITH BK SERIES SMD UNITS. B-CABLE CONNECTOR P2B CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

1
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D C B A

D I C B A



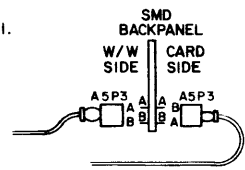
| | | | |
|---------------------|--|------------------|----------|
| CODE IDENT | | 83319600 | A |
| CROSS REF NO | | 403 | SHEET 43 |
| CONTROL DATA | | I/O BYPASS CABLE | |
| NORMANDALE DIVISION | | TB304B/C | |
| PAGE | | 5 - 43 | |

DRIVE BACKPANEL

NOTES:

- ⚠ DESIGNATION DEPENDS ON SPECIFIC DRIVE. THEY ARE AS FOLLOWS:
- ⚠ JUMPER WIRE INSIDE PLUG A2P1.
- ⚠ A AND B DESIGNATION REVERSED ON BJ5XX AND BJ7X BECAUSE PLUG CONNECTS TO CARD SIDE ON THESE UNITS.

- BJ4XX - JA84
- BJ5XX - JA03
- BJ7XX - JA03
- BK4XX - AO2
- BK5XX - AO2
- BK6XX - JA84
- BK7XX - JA84



D I C B A

D C B A

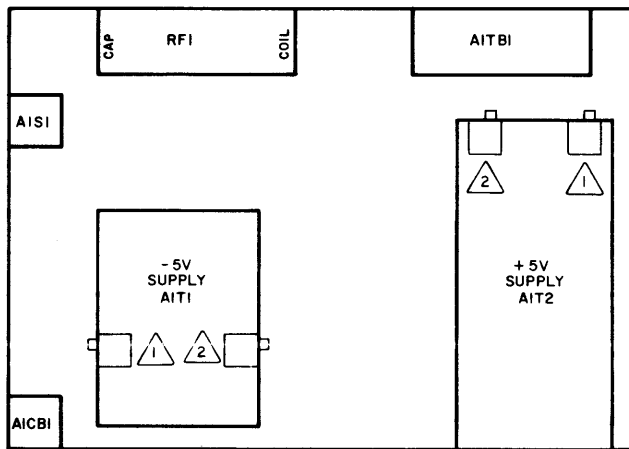
1

2



3

4

POWER SUPPLY
BASIC COMPONENT LAYOUT



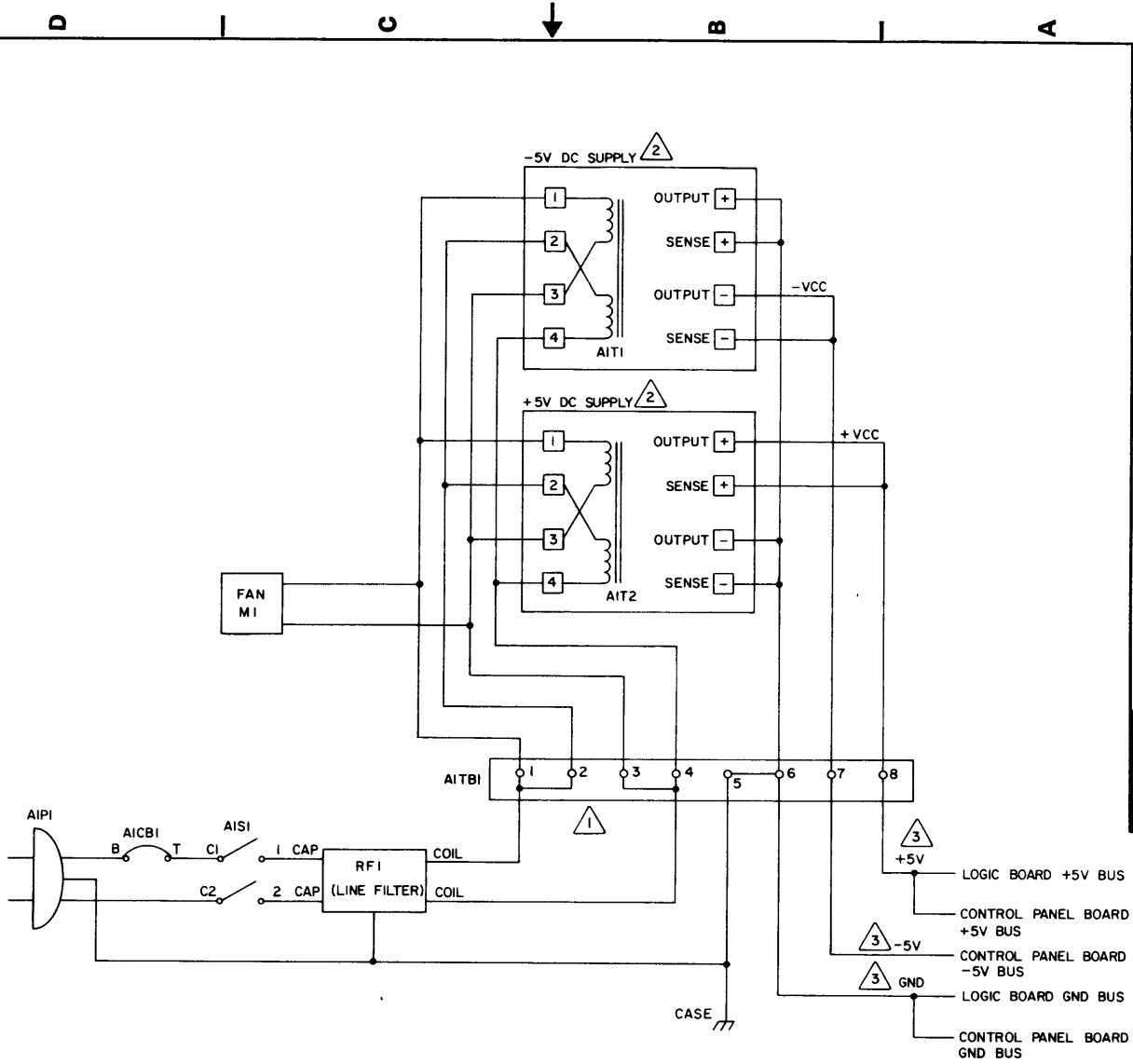
NOTES:

-  VOLTAGE POT (SCREWDRIVER ADJ)
-  OVERVOLTAGE POT (SCREWDRIVER ADJ)

| | | | | | |
|--------------|------|---|----------|-------|------|
| CODE IDENT | 1933 | C | 83319600 | D | B |
| CROSS REF NO | 500 | | | SHEET | 44 |
| | | | | PAGE | 5-44 |

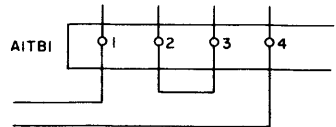
| | | |
|-------------------------|---------------------|----------|
| CONTROL DATA | POWER SUPPLY LAYOUT | TB304B/C |
| NORMAN DALE DIVISION | | |

D C B A



NOTES:

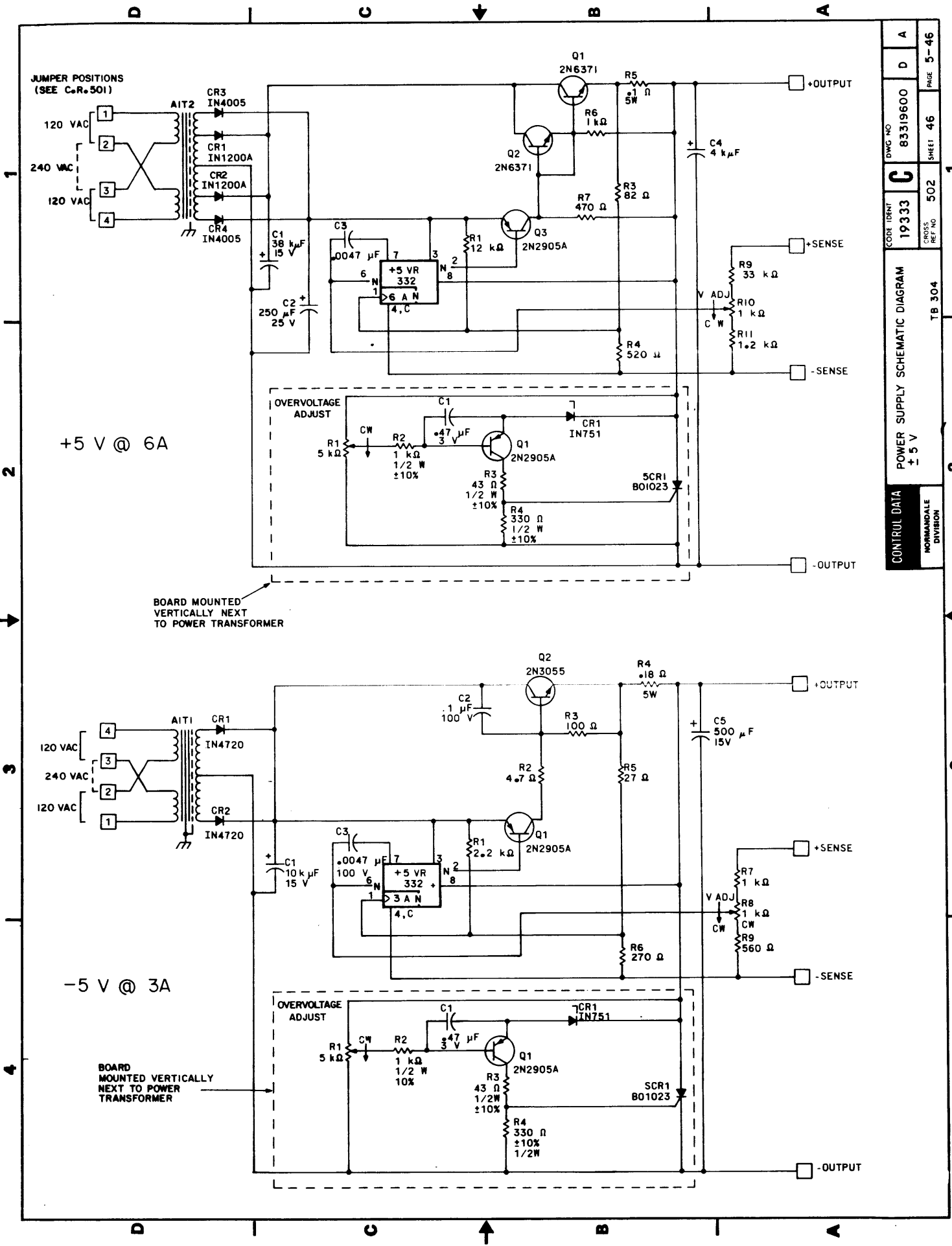
1 WIRING SHOWN FOR 110V OPERATION
 FOR 220V OPERATION, JUMPER 1-2 AND 3-4 ARE REMOVED AND JUMPER 2-3 IS ADDED. THE RESULTANT IS SHOWN BELOW



2 THESE ARE REPLACED AS A UNIT AND THEREFORE INDIVIDUAL COMPONENTS (OTHER THAN TRANSFORMERS) ARE NOT SHOWN

3 REFER TO KEY TO LOGIC FOR +5V, -5V AND GND BUS CONNECTIONS

| | | | |
|-----------------------------|----------|---------------------|-----------|
| CONTROL DATA | | NORMANDALE DIVISION | |
| POWER SUPPLY WIRING DIAGRAM | | | |
| CODE IDENT | 83319600 | D | B |
| 19333 | | | |
| CROSS REF NO | 501 | SHEET | 45 |
| | | | PAGE 5-45 |
| TB304B/C | | | |
| CROSS REF NO | | 501 | |

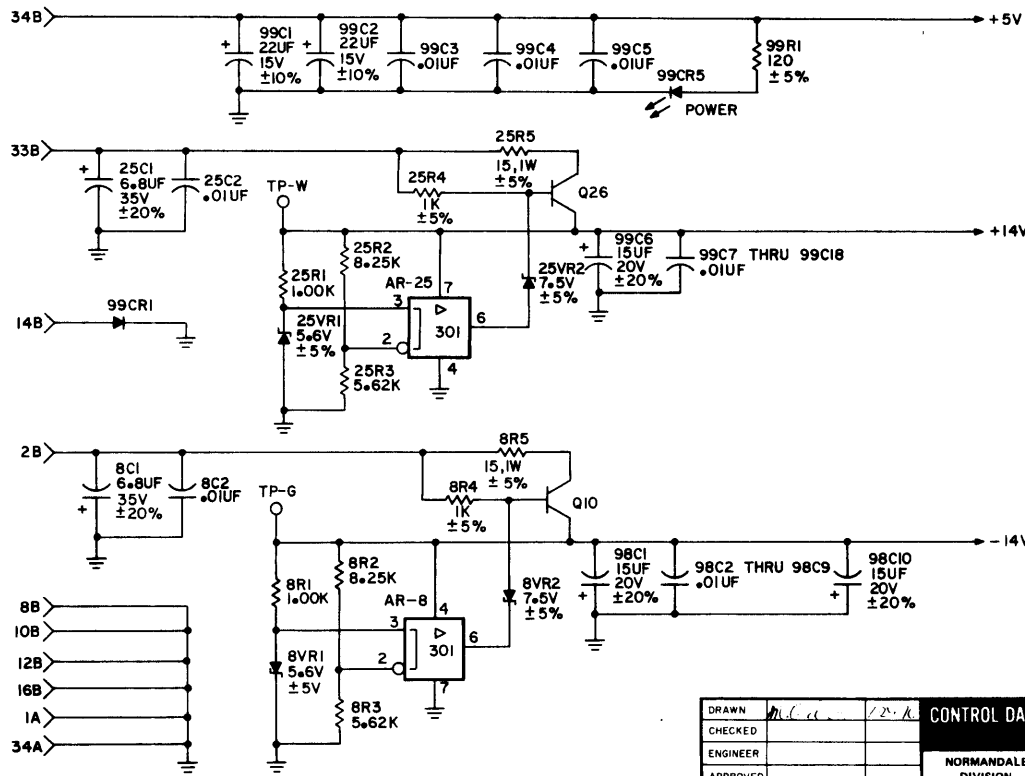
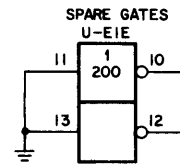


| | | | |
|--------------------------------|----------|-------|------|
| DWG NO | 83319600 | PAGE | 5-46 |
| CODE IDENT | 19333 | SHEET | 46 |
| CROSS REF NO | 502 | | |
| POWER SUPPLY SCHEMATIC DIAGRAM | | | |
| +5 V | | | |
| TB 304 | | | |

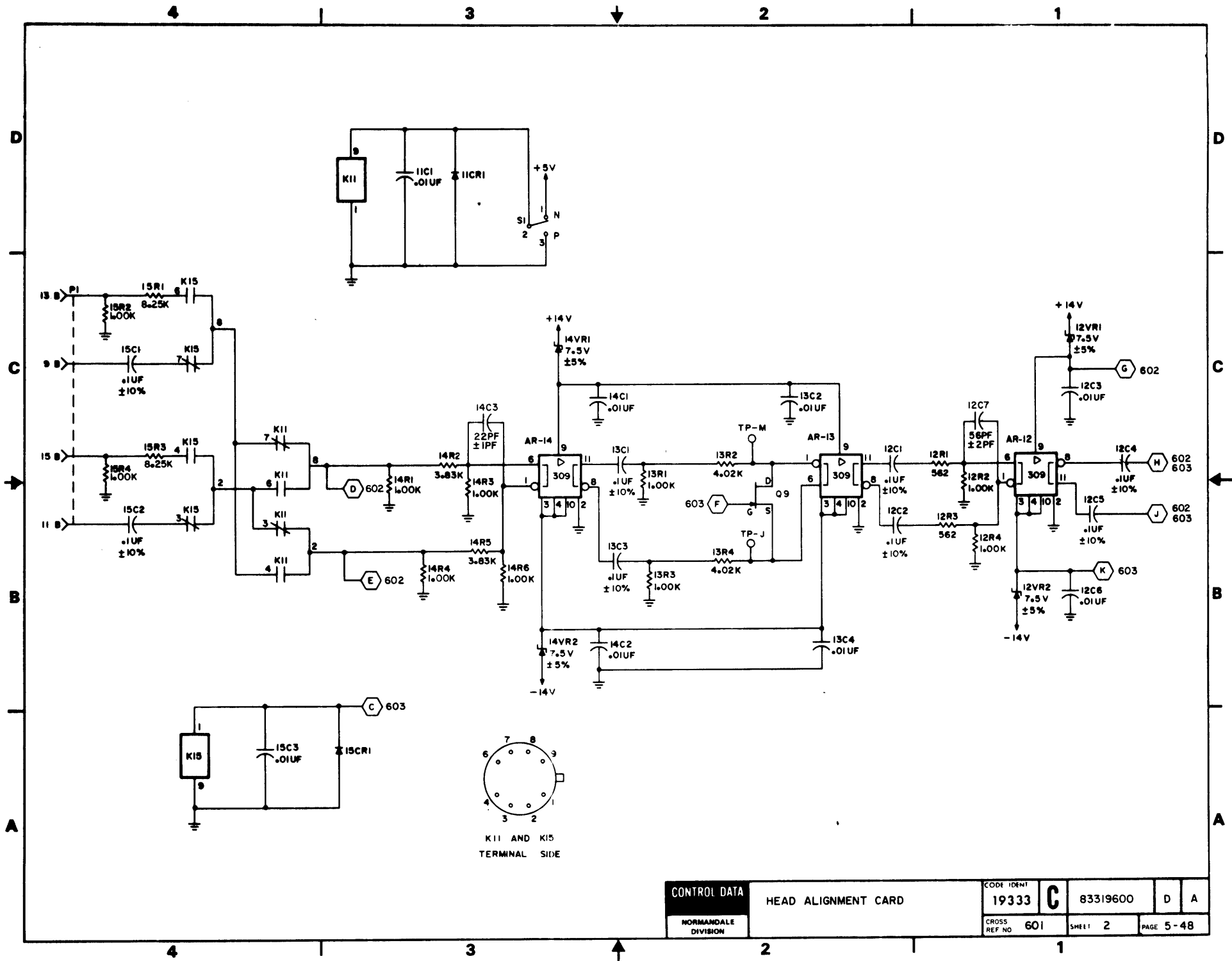
REVISION STATUS OF SHEETS

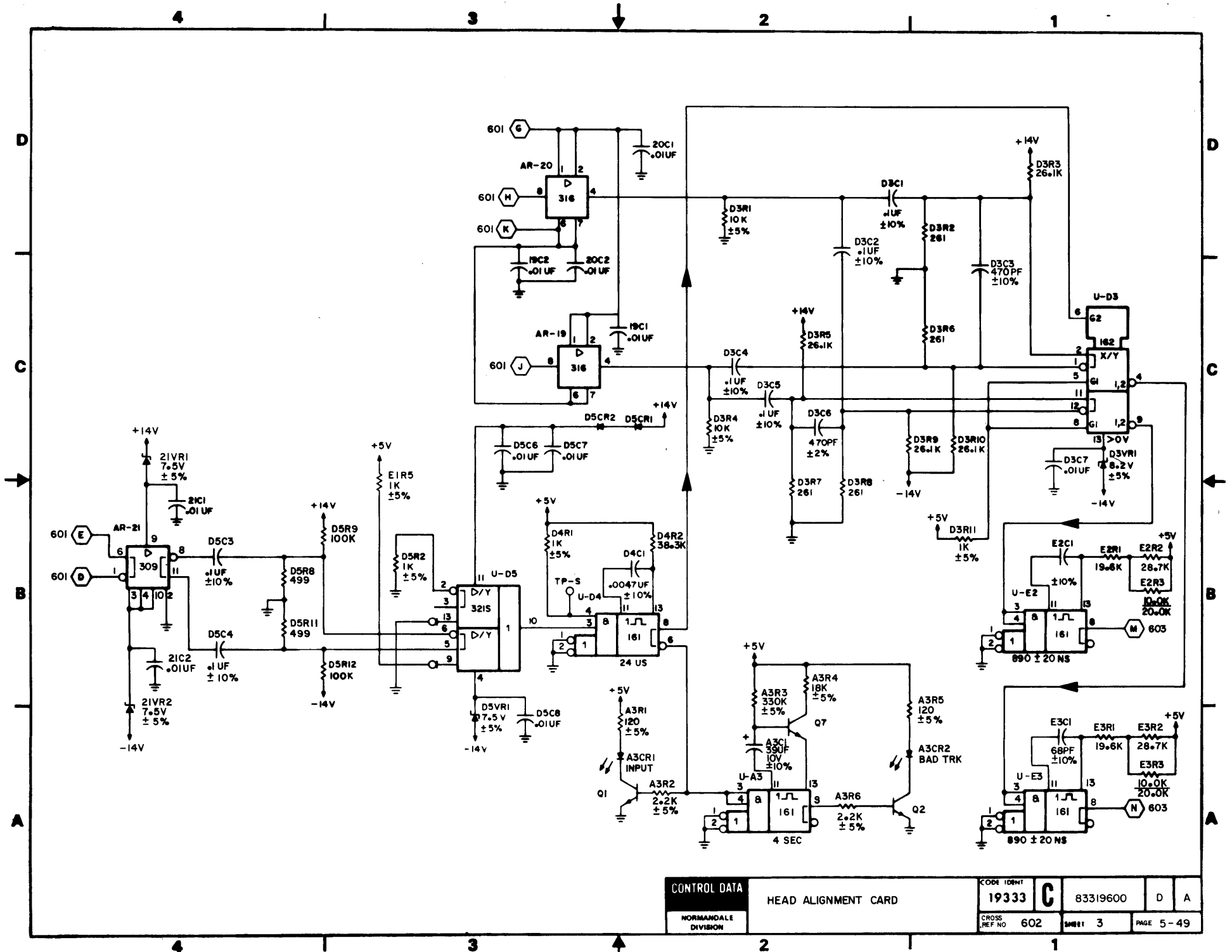
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|--|
| A | A | A | A | | | | | | | | | | | | | | | | | |
| B | | | B | | | | | | | | | | | | | | | | | |

| REVISIONS | | | | | |
|-----------|---------|-------------------|-------|---------|-------|
| REV. | ECO. | DESCRIPTION | DRFT. | DATE | CHK'D |
| A | PE23000 | RELEASED | MLA | 3-14-77 | |
| B | | ADD NOTE TO SHT 4 | MA | | |



| | | | | | | | | | | |
|----------|-----|------|--------------|---------------------|--------------|-------|-------|----------|------|------|
| DRAWN | MLC | 12-A | CONTROL DATA | HEAD ALIGNMENT CARD | CODE IDENT | 19333 | C | 83319600 | D | B |
| CHECKED | | | | DIAGRAMS | CROSS REF NO | 600 | SHEET | 1 of 4 | PAGE | 5-47 |
| ENGINEER | | | NORMANDEALE | TYPE: HFSV | | | | | | |
| APPROVED | | | DIVISION | | | | | | | |

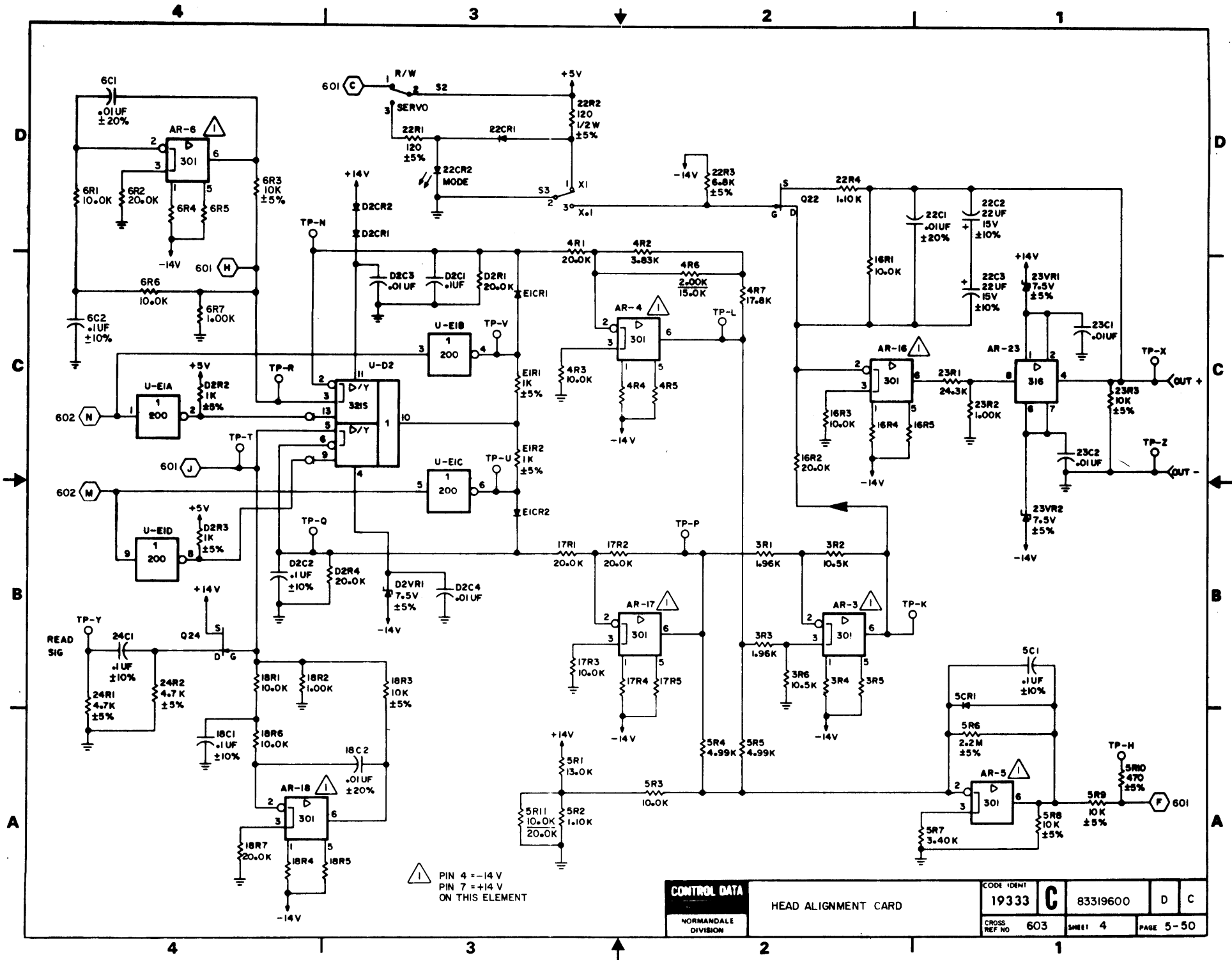





| | | | | |
|----------------------|--|--------------|------|----------|
| CONTROL DATA | | CODE IDENT | | |
| NORMANDEALE DIVISION | | 19333 | C | 83319600 |
| HEAD ALIGNMENT CARD | | CROSS REF NO | 602 | SM11 3 |
| | | PAGE | 5-49 | |

TB304A

DIAGRAMS

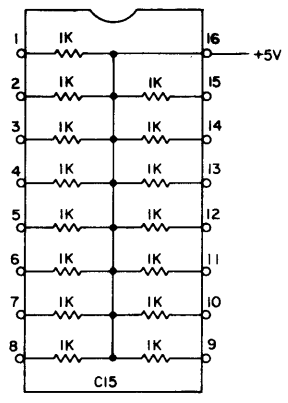


 PIN 4 = -14 V
 PIN 7 = +14 V
 ON THIS ELEMENT

| | | | | |
|--------------|----------------------|---------------------|-----------|----------|
| CONTROL DATA | HEAD ALIGNMENT CARD | | | |
| | NORMANDEALE DIVISION | CODE IDENT 19333 | C | 83319600 |
| | CROSS REF NO 603 | SHEET 4 | PAGE 5-50 | |

D | C | B | A

HEADER CHIP CONNECTORS

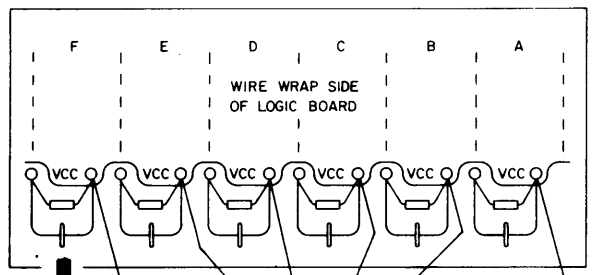


ALL 1K RESISTORS FOUND IN THESE DIAGRAMS ARE LOCATED ON THIS HEADER CHIP (UNLESS OTHERWISE SPECIFIED) WHICH 1K RESISTOR IS BEING REFERRED IS DETERMINED BY TRACING THE WIREWRAP CONNECTIONS (VIA THE LOGIC WIRELIST) BACK TO THIS HEADER CHIP

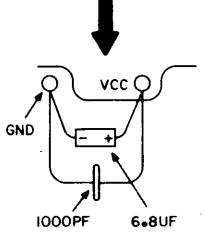
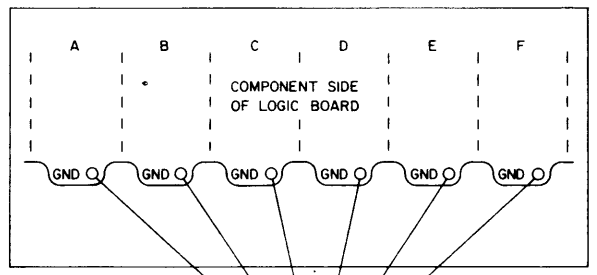
NOTES

1 THE FOLLOWING SHEETS ARE THE LOGICAL DIAGRAMS FOR THE LOGIC (WIREWRAP) BOARD

POWER CONNECTIONS



GROUND CONNECTIONS

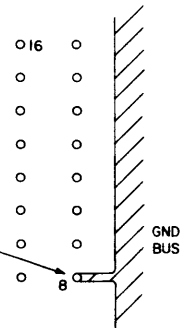
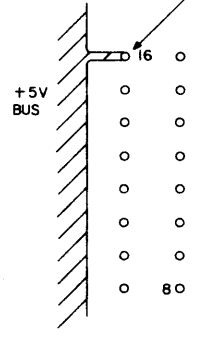


AITBI-8
POWER SUPPLY
(CROSS REF NO 501)

AITBI-6
POWER SUPPLY
(CROSS REF NO 501)

PIN 16 OF EACH CHIP LOCATION CONNECTS TO +5V BUS EXCEPT AT CHIP LOCATIONS A01, A02, A03, A04, A06, AND A20

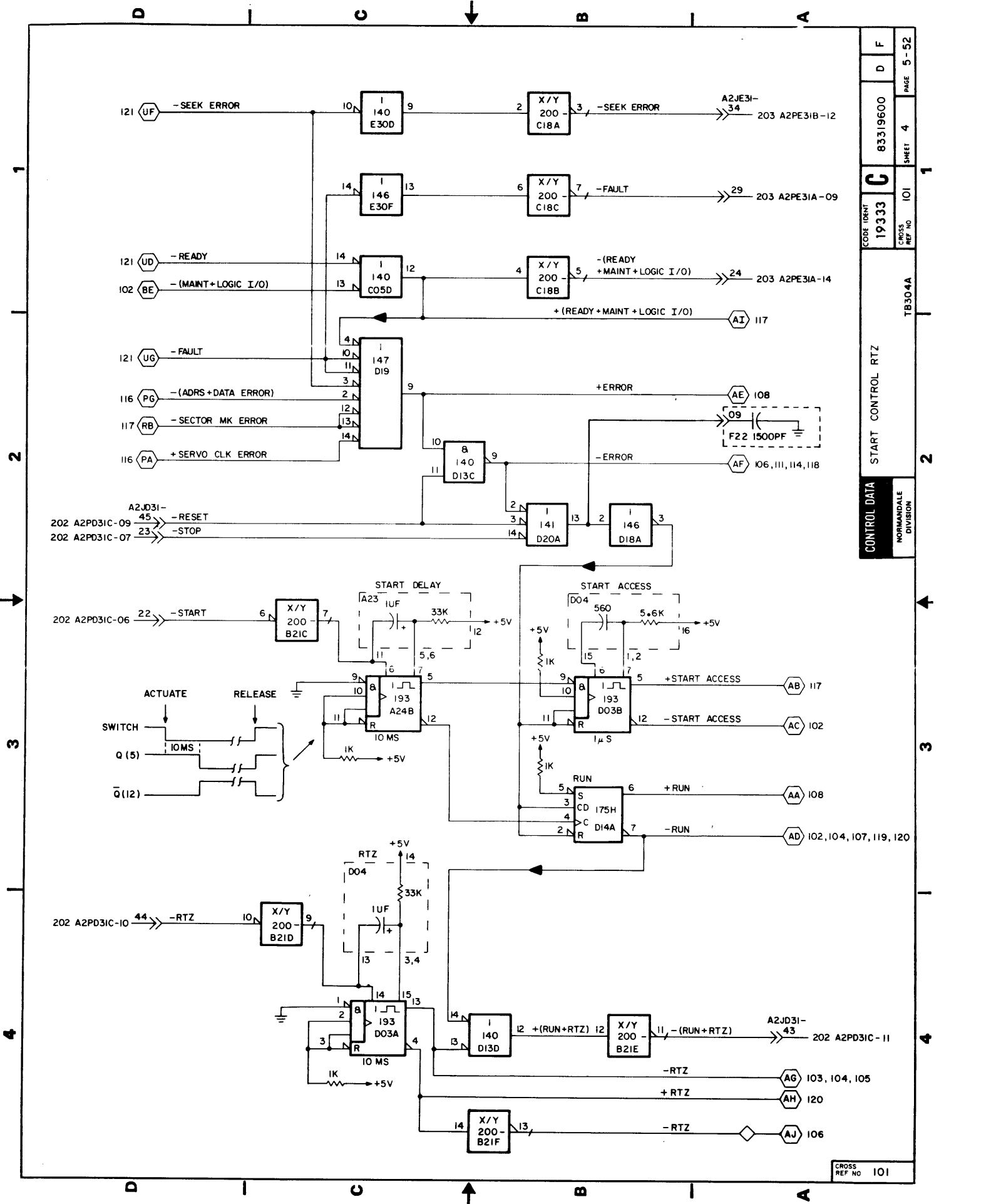
PIN 8 OF EACH CHIP LOCATION CONNECTS TO GND BUS EXCEPT AT CHIP LOCATIONS A01, A02, A03, A04, A19, D04, F01, AND F06



| | | | | | | |
|---------------------|-------------|--------|------------------|------------------|---------|-----------|
| CONTROL DATA | LOGIC BOARD | TB304A | CODE IDENT 19333 | CROSS REF NO 100 | SHEET 3 | PAGE 5-51 |
| MEMORANDUM DIVISION | | | 83319600 | C | A | |

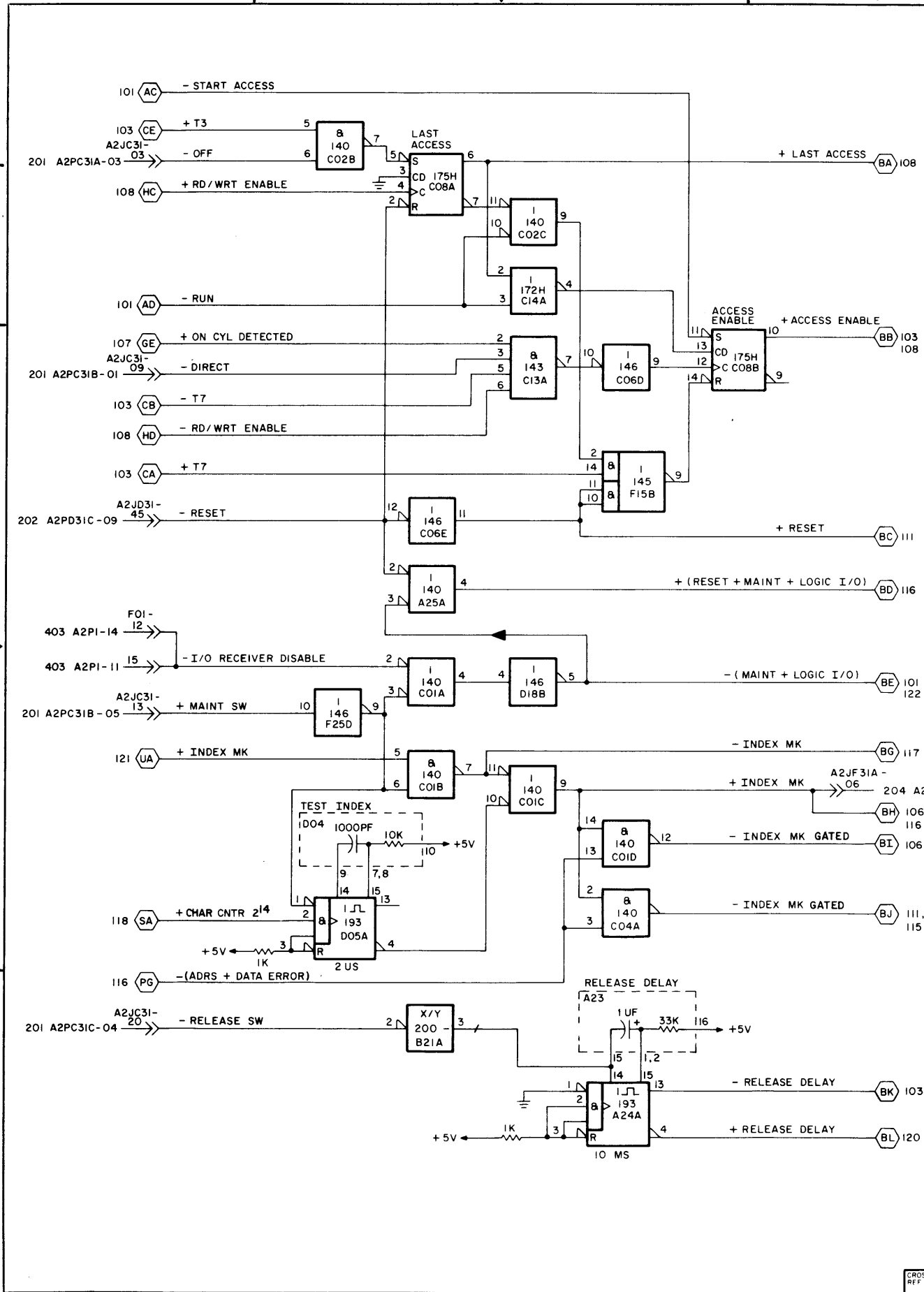
1
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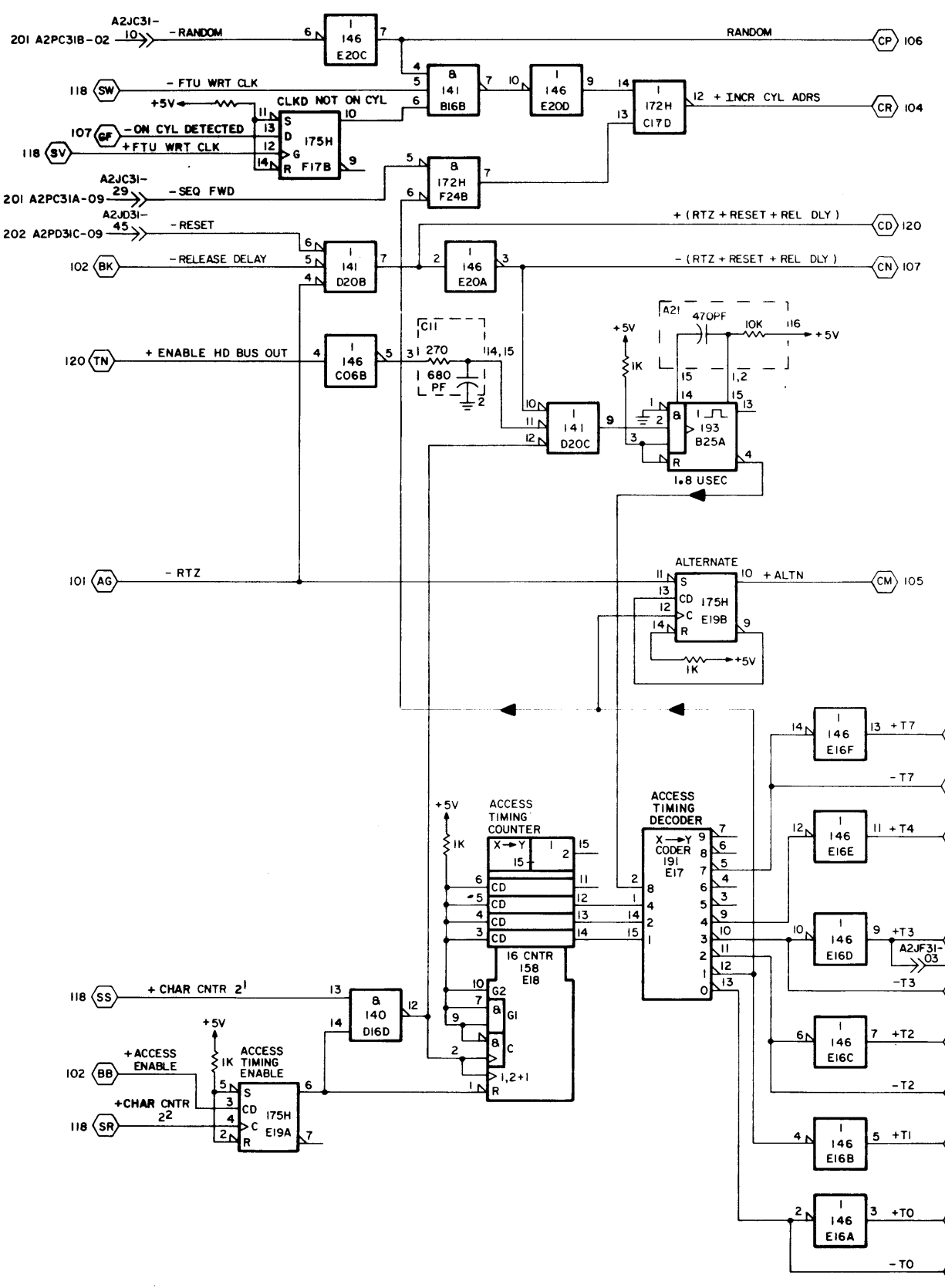
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|---------------------|----------|---|------|
| CODE IDENT | 83319600 | D | F |
| CROSS REF NO | 19333 | C | D |
| SHEET | 101 | 4 | 5-52 |
| CONTROL DATA | | | |
| START CONTROL RTZ | | | |
| NORMANDALE DIVISION | | | |
| TB304A | | | |

CROSS REF NO 101

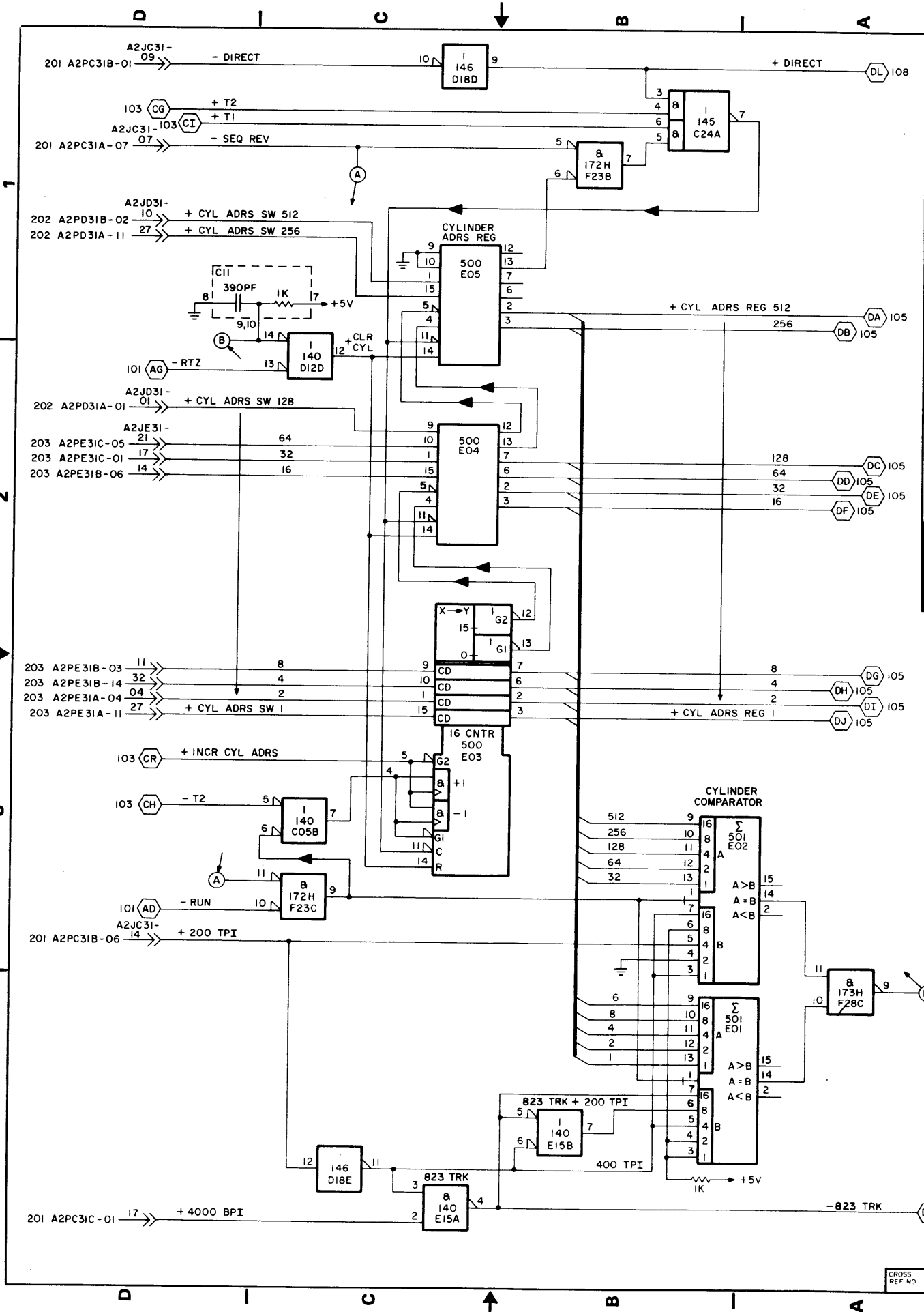


D I C B I A

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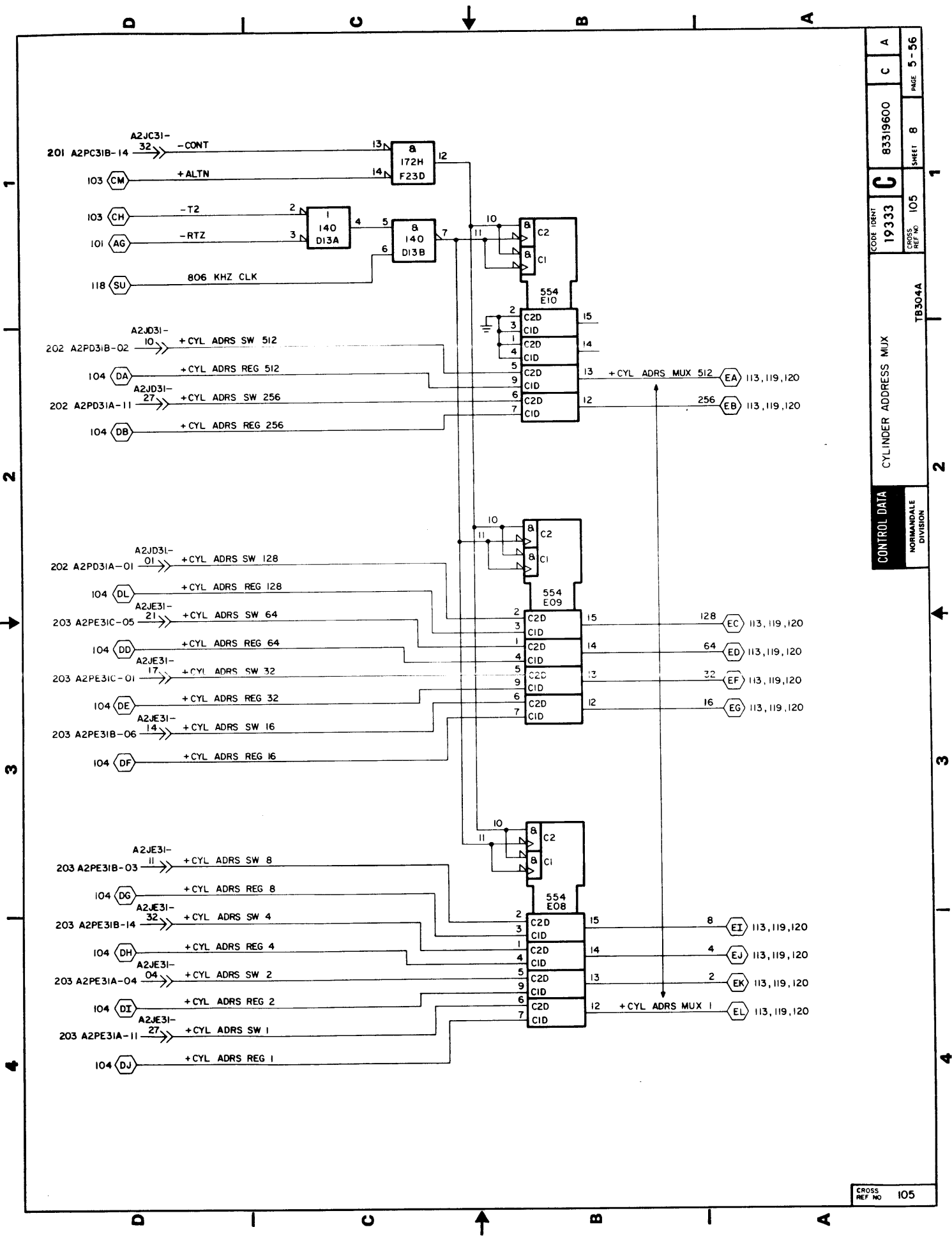
| | | | |
|----------------------------------|---------------------|------------|--------------|
| CODE IDENT 19333 | CROSS REF NO 103 | SHEET 6 | PAGE 5-54 |
| | | | |
| ACCESS TIMING, INCR CYL ADRS REG | | | |
| CONTROL DATA | | | |
| NORMANDALE DIVISION | | | |
| TB304A | | | |
| CROSS REF NO 103 | | | |



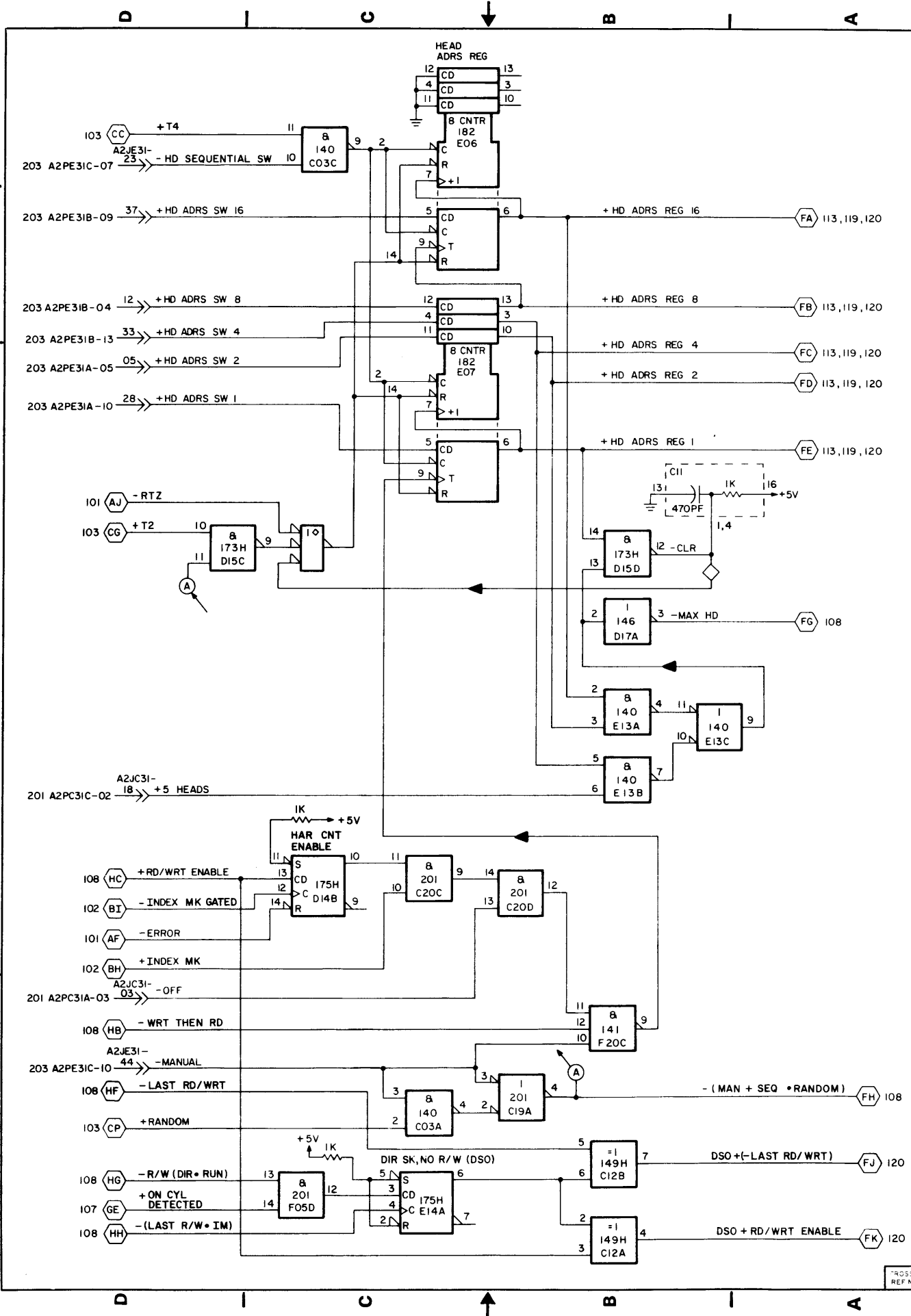
1
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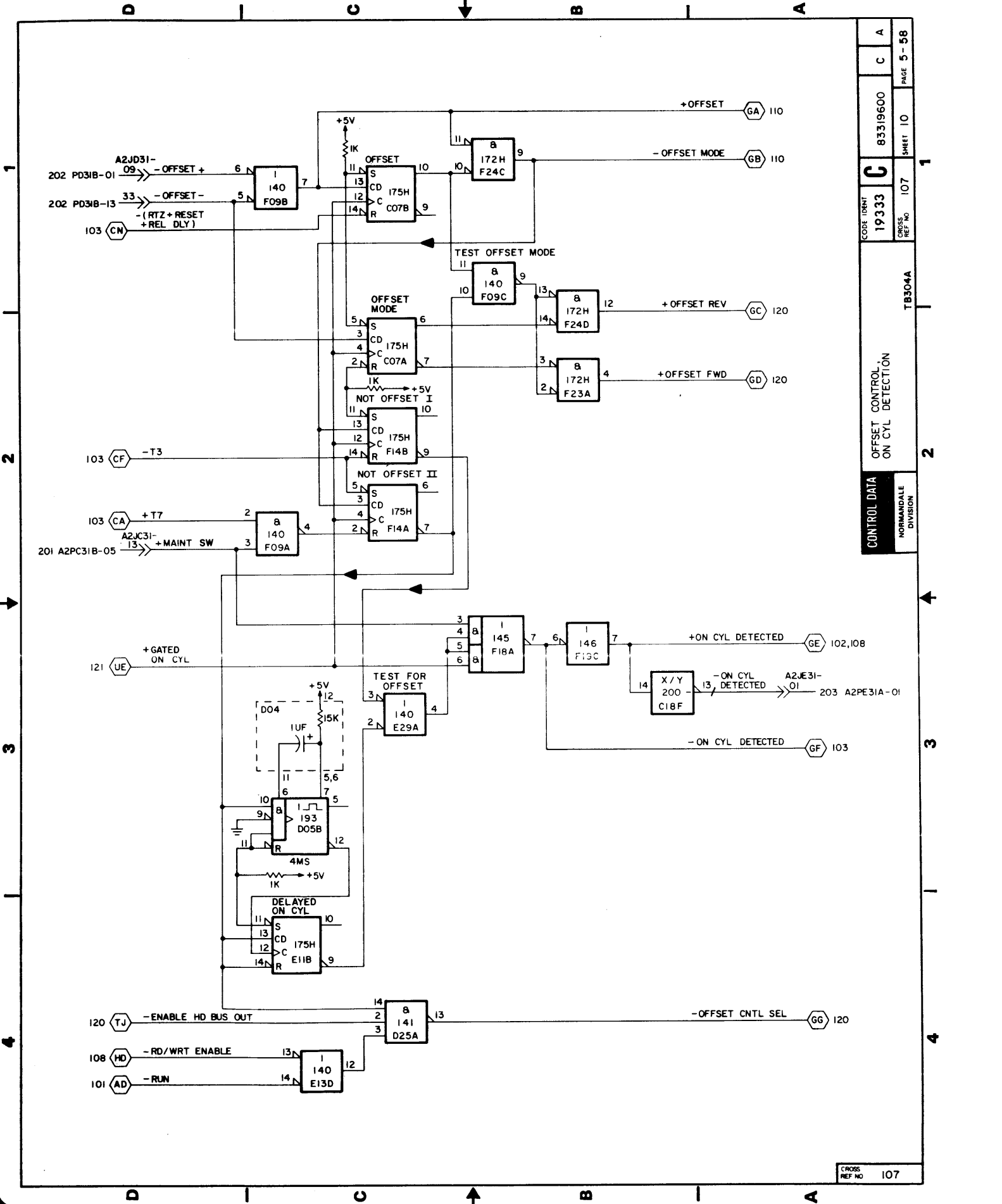
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D C B A



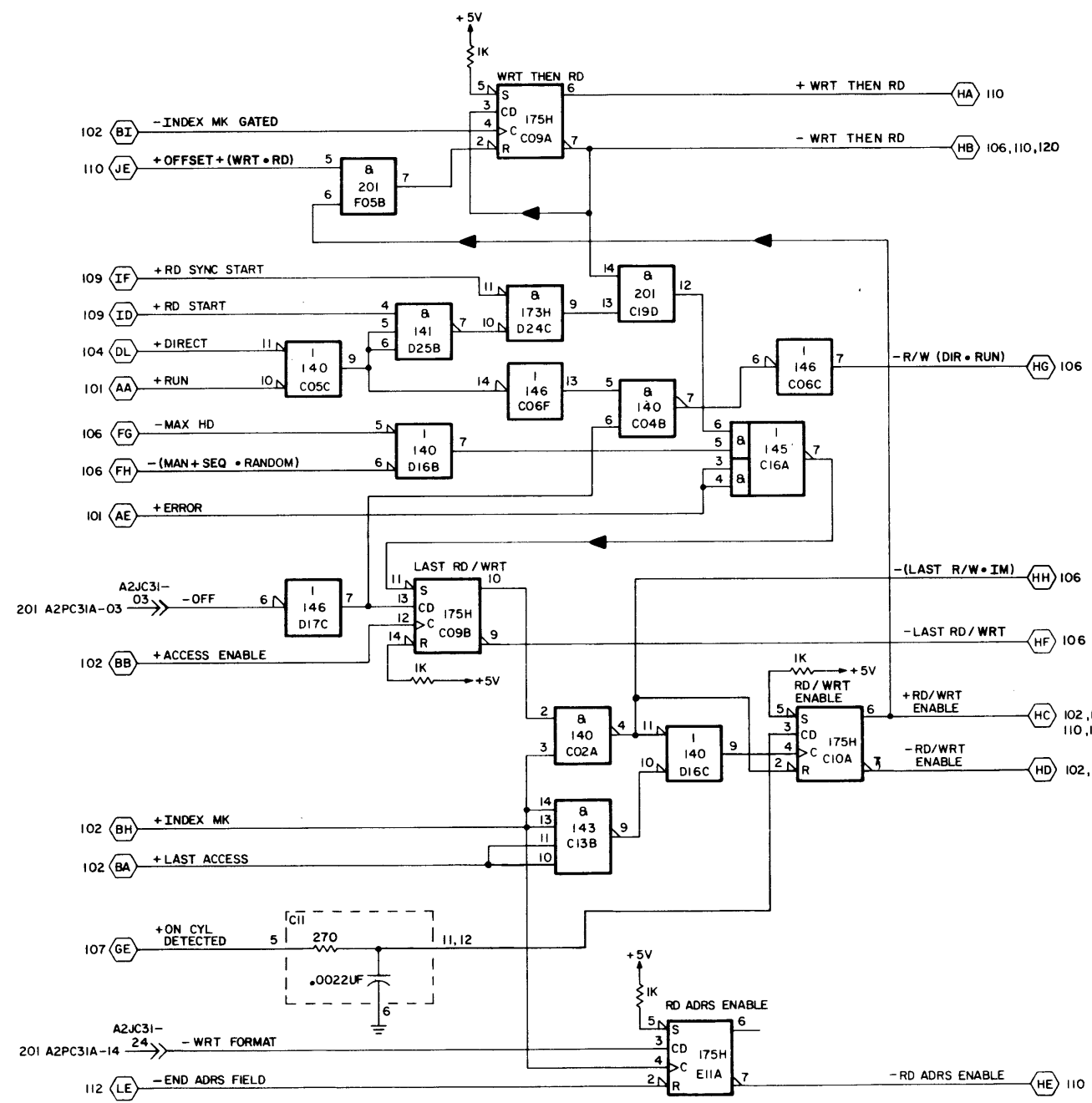
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|----------------------|----------|-----------|
| CODE IDENT | 83319600 | A |
| 19333 | | C |
| REV. REF. NO. | 105 | PAGE 5-56 |
| | SHEET 8 | |
| CYLINDER ADDRESS MUX | | |
| TB3044 | | |
| CONTROL DATA | | |
| NORMAN DALE DIVISION | | |





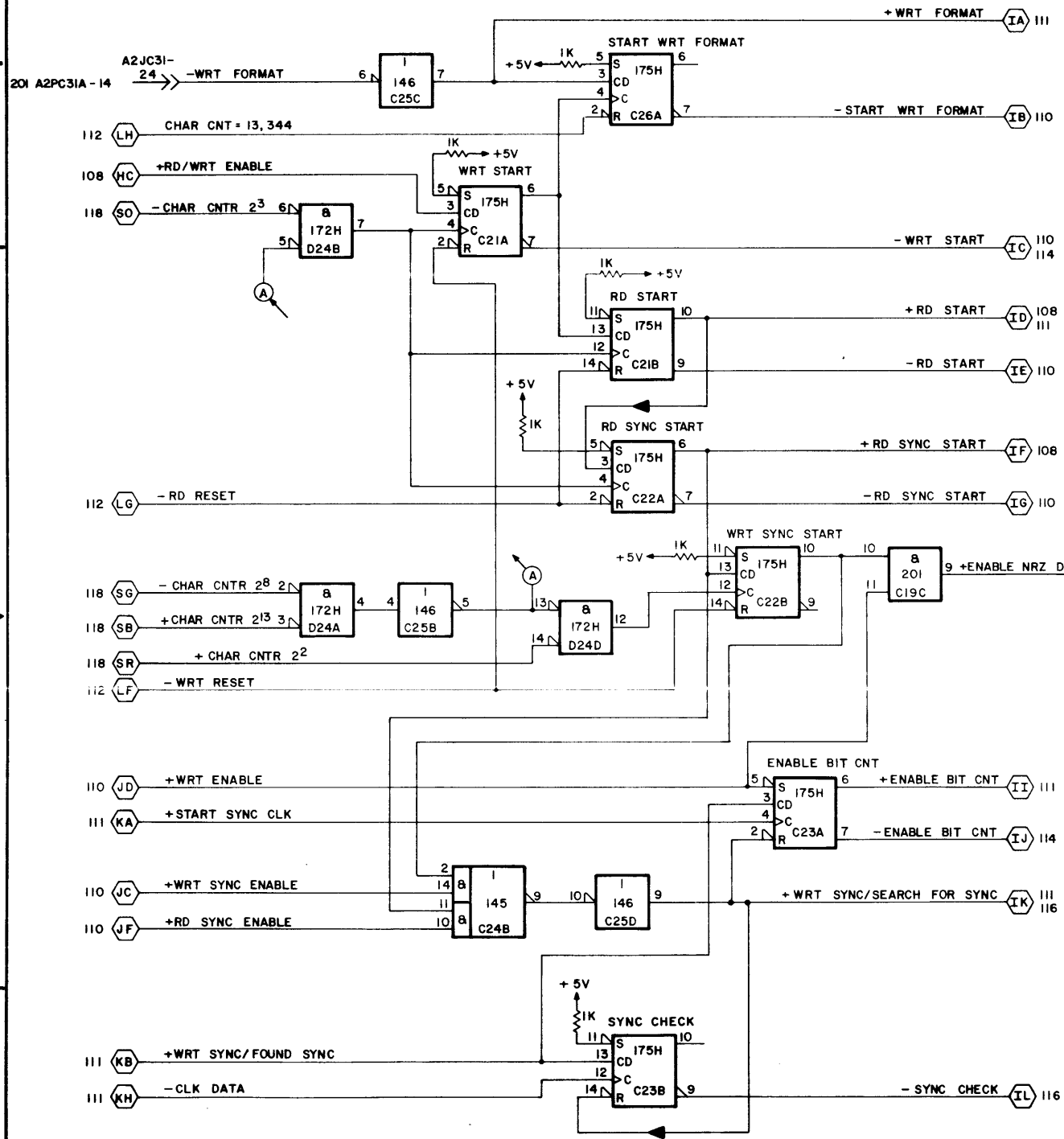
| | | | |
|---------------------------------|----------|---|---|
| CODE INST | 83319600 | C | A |
| CROSS REF NO | 19333 | C | A |
| SHEET NO | 107 | C | A |
| PAGE 5-58 | | | |
| TB304A | | | |
| OFFSET CONTROL ON CYL DETECTION | | | |
| NORMAN DALE DIVISION | | | |

CROSS REF NO 107



D I C B I A

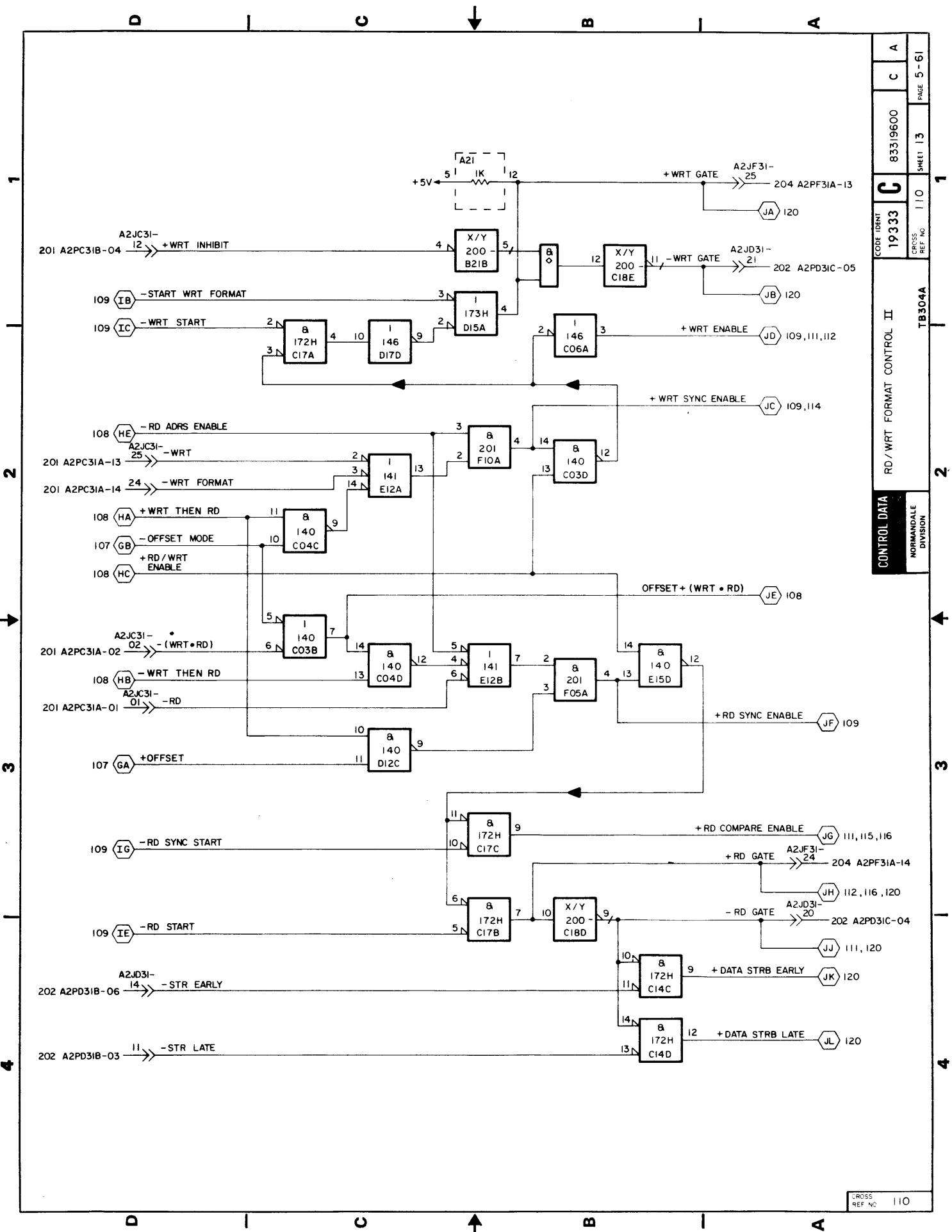
| | | | |
|---------------------------|----------|----|------|
| CODE IDENT | 83319600 | C | A |
| CROSS REF NO | 19333 | | |
| SHEET NO | 109 | 12 | 5-60 |
| TB304A | | | |
| RD / WRT FORMAT CONTROL I | | | |
| CONTROL DATA | | | |
| NORMANDALE DIVISION | | | |
| CROSS REF NO | 109 | | |

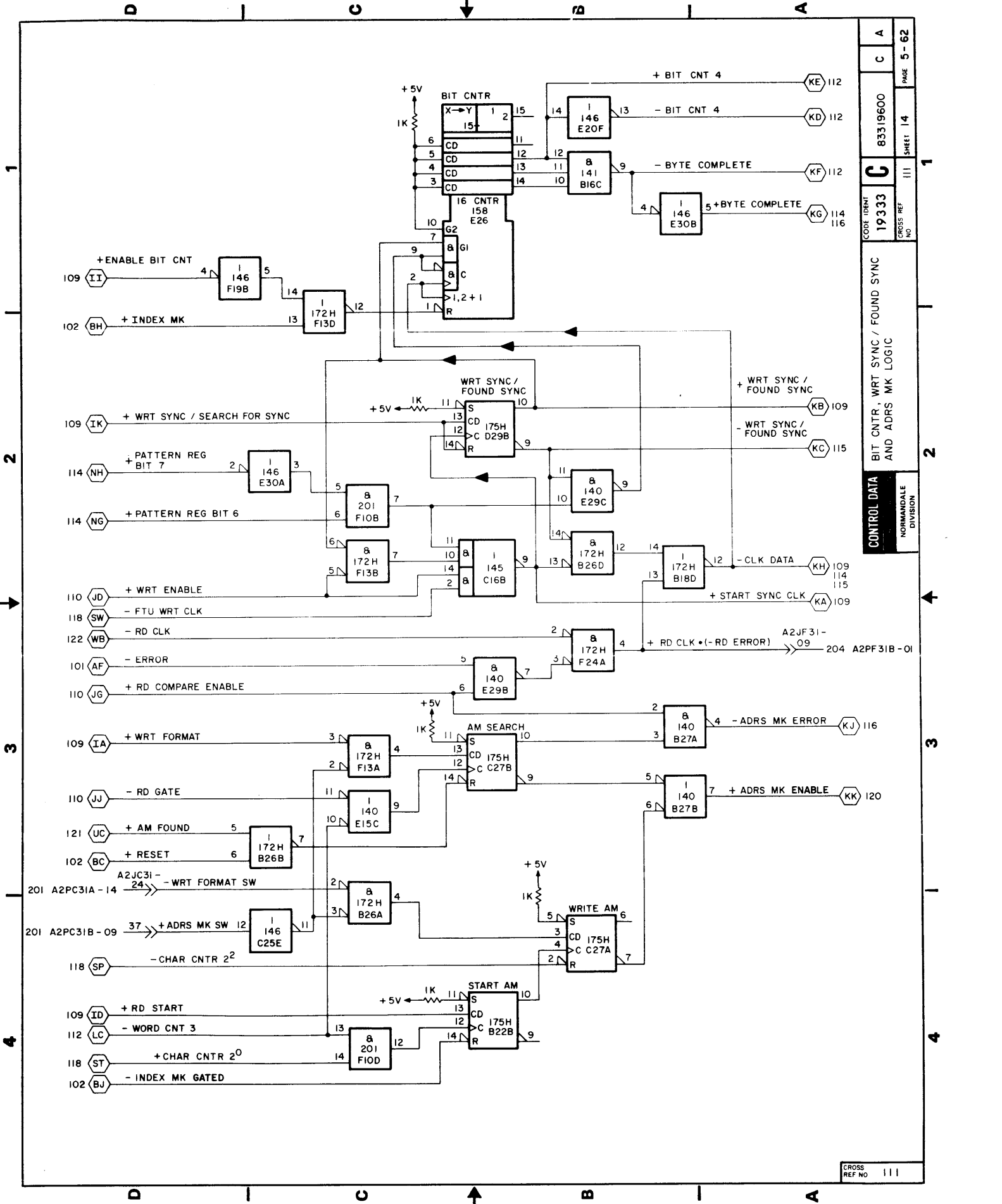


D I C B I A

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1
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4



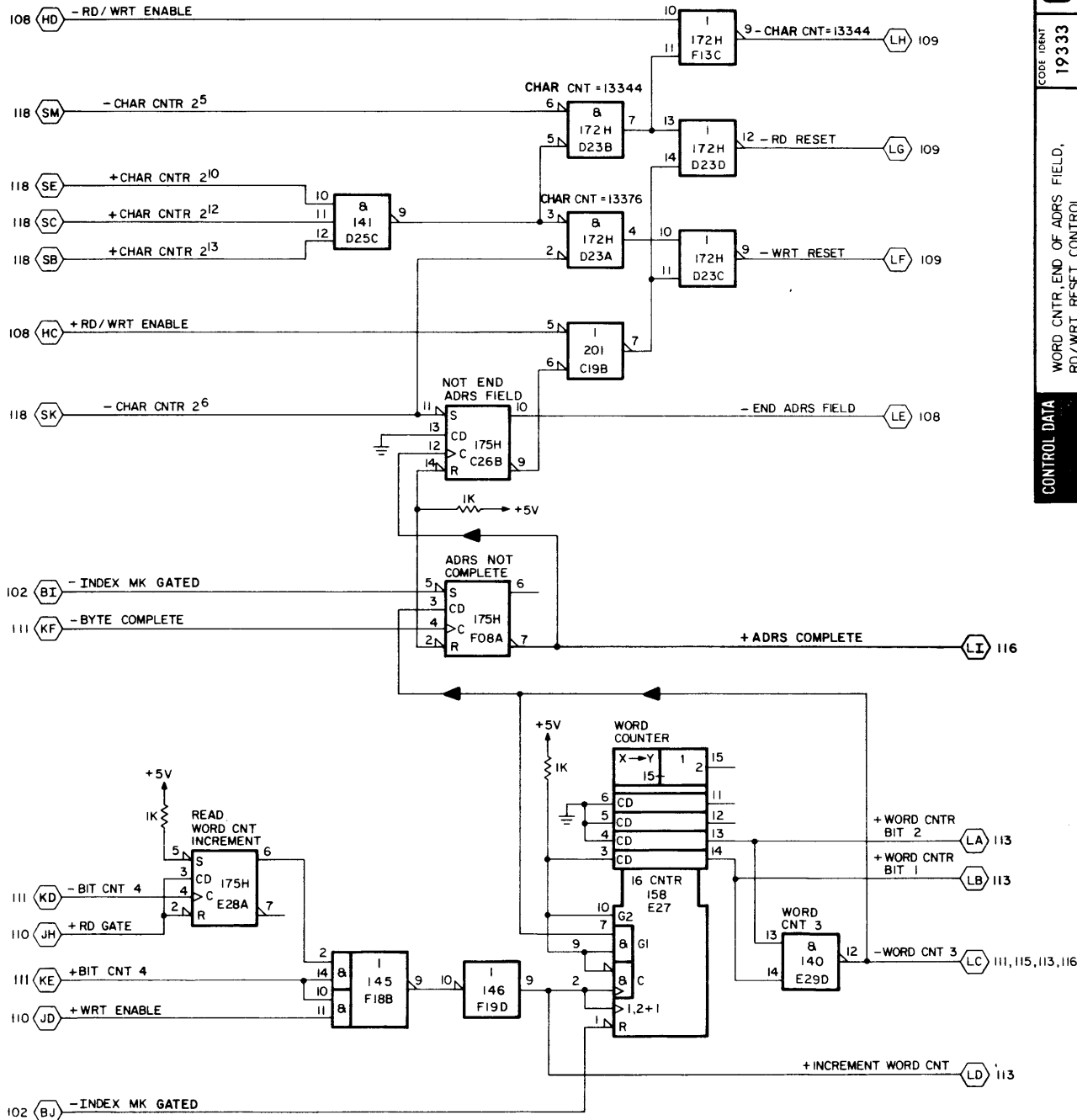


CODE IDENT
19333
 CROSS REF NO

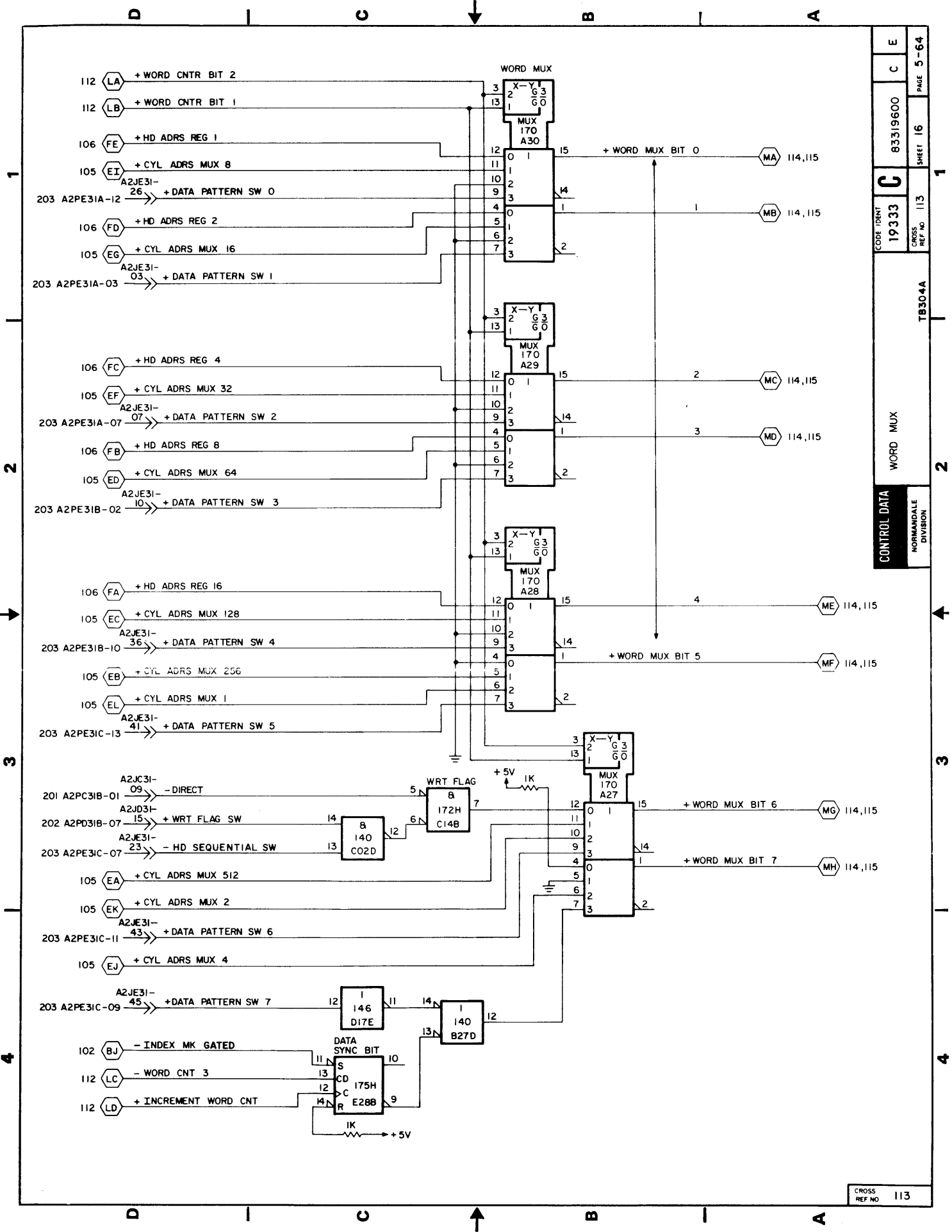
83319600
 SHEET 14
 PAGE 5-62

CONTROL DATA
 BIT CNTR, WRT SYNC / FOUND SYNC
 AND ADRS MK LOGIC
 NORMANDALE
 DIVISION

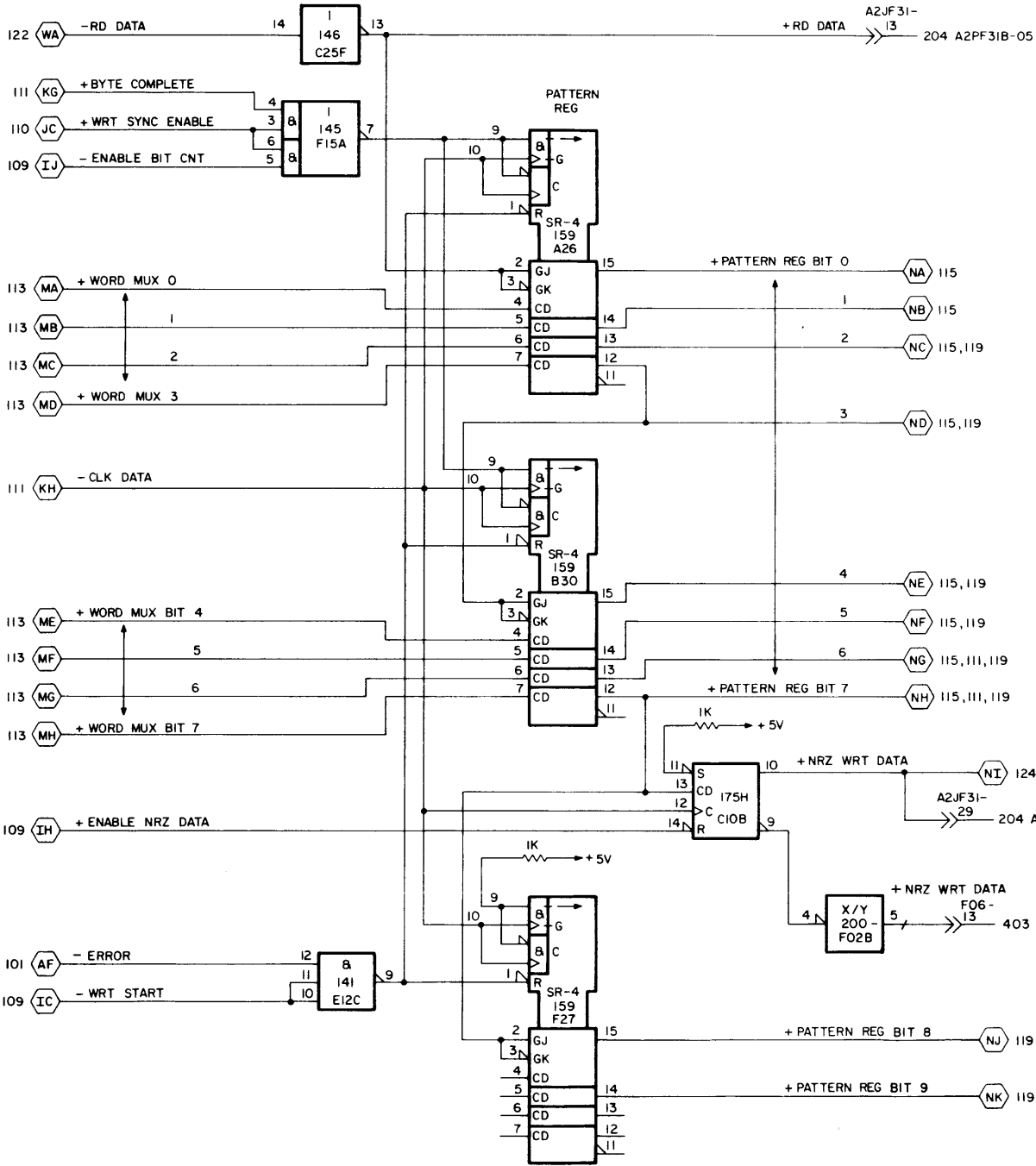
CROSS REF NO III



| | | | |
|----------------------------------------------------|----------|----|------|
| CODE IDENT | 83319600 | C | E |
| CROSS REF NO | 19333 | C | C |
| SHEET | 112 | 15 | 5-63 |
| WORD CNTR, END OF ADRS FIELD, RD/WRT RESET CONTROL | | | |
| NORMANDALE DIVISION | | | |
| TB304A | | | |



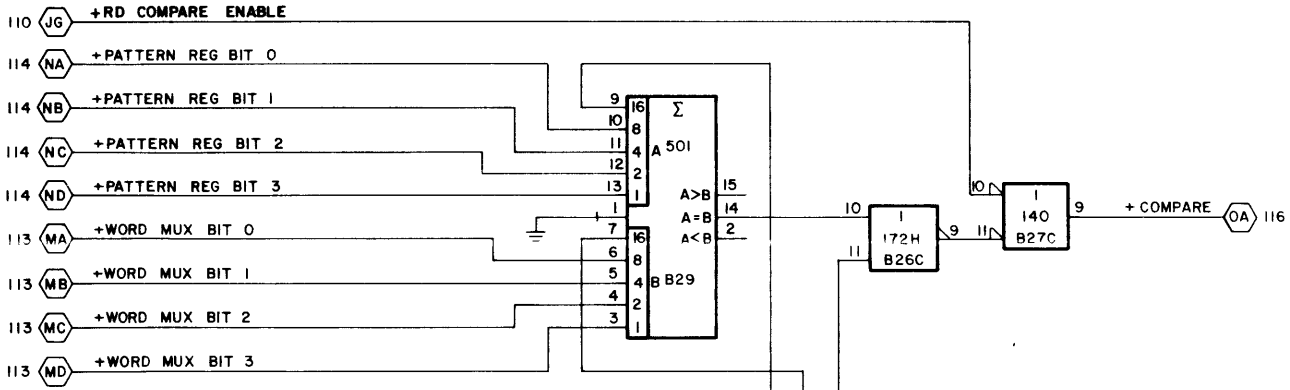
| | | | |
|--------------|----------|---------------------|---|
| CODE IDENT | 83319600 | C | E |
| CROSS REF NO | 19333 | C | |
| CROSS REF NO | 113 | | |
| TB304A | | WORD MUX | |
| CONTROL DATA | | NORMANDALE DIVISION | |



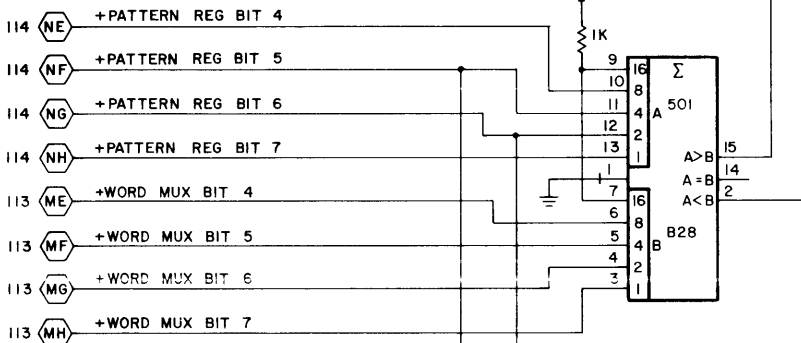
| | | | | |
|---------------------|-------|----------|----|------|
| CODE IDENT | 19333 | 83319600 | C | A |
| CROSS REF NO | 114 | SHEET | 17 | PAGE |
| | | | | 5-65 |
| TB304A | | | | |
| PATTERN REG | | | | |
| CONTROL DATA | | | | |
| NORMANDALE DIVISION | | | | |

D I C B I A

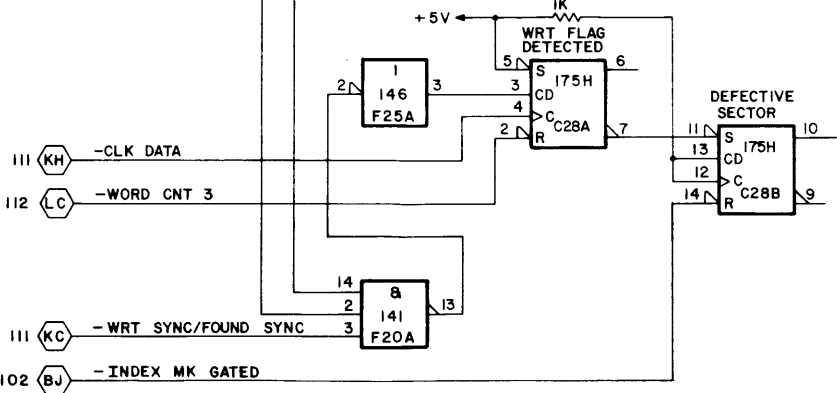
1



2



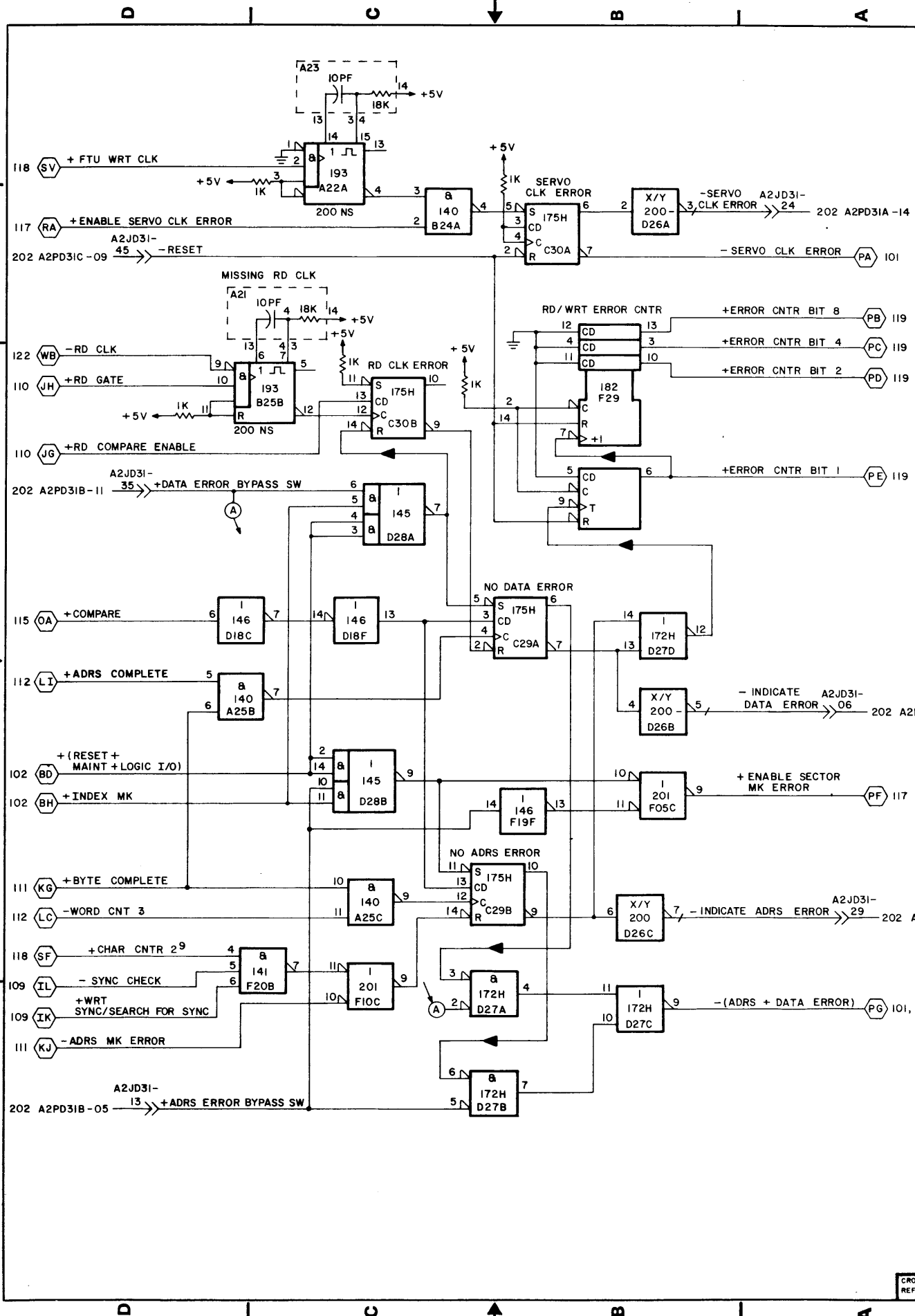
3



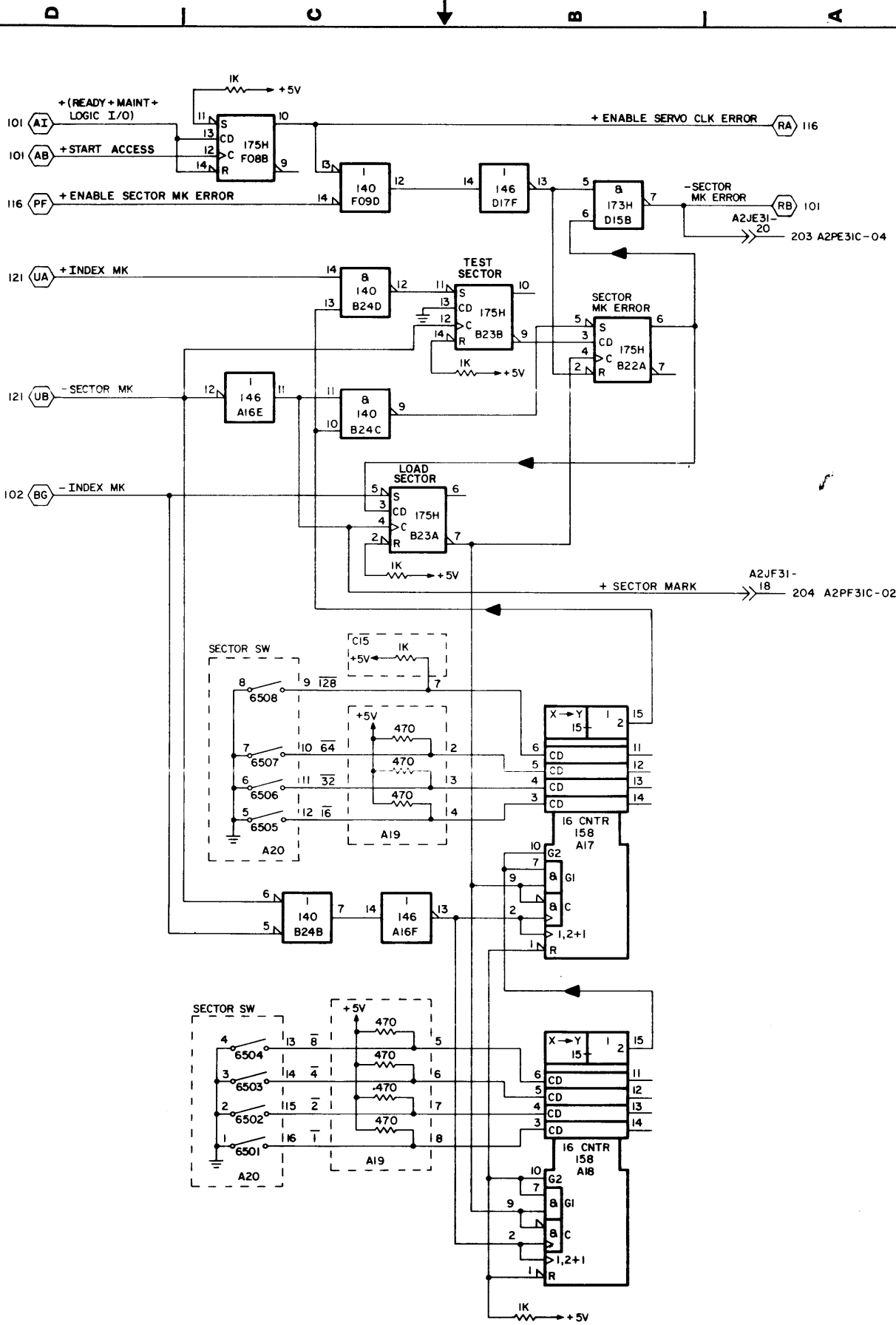
4

D I C B I A

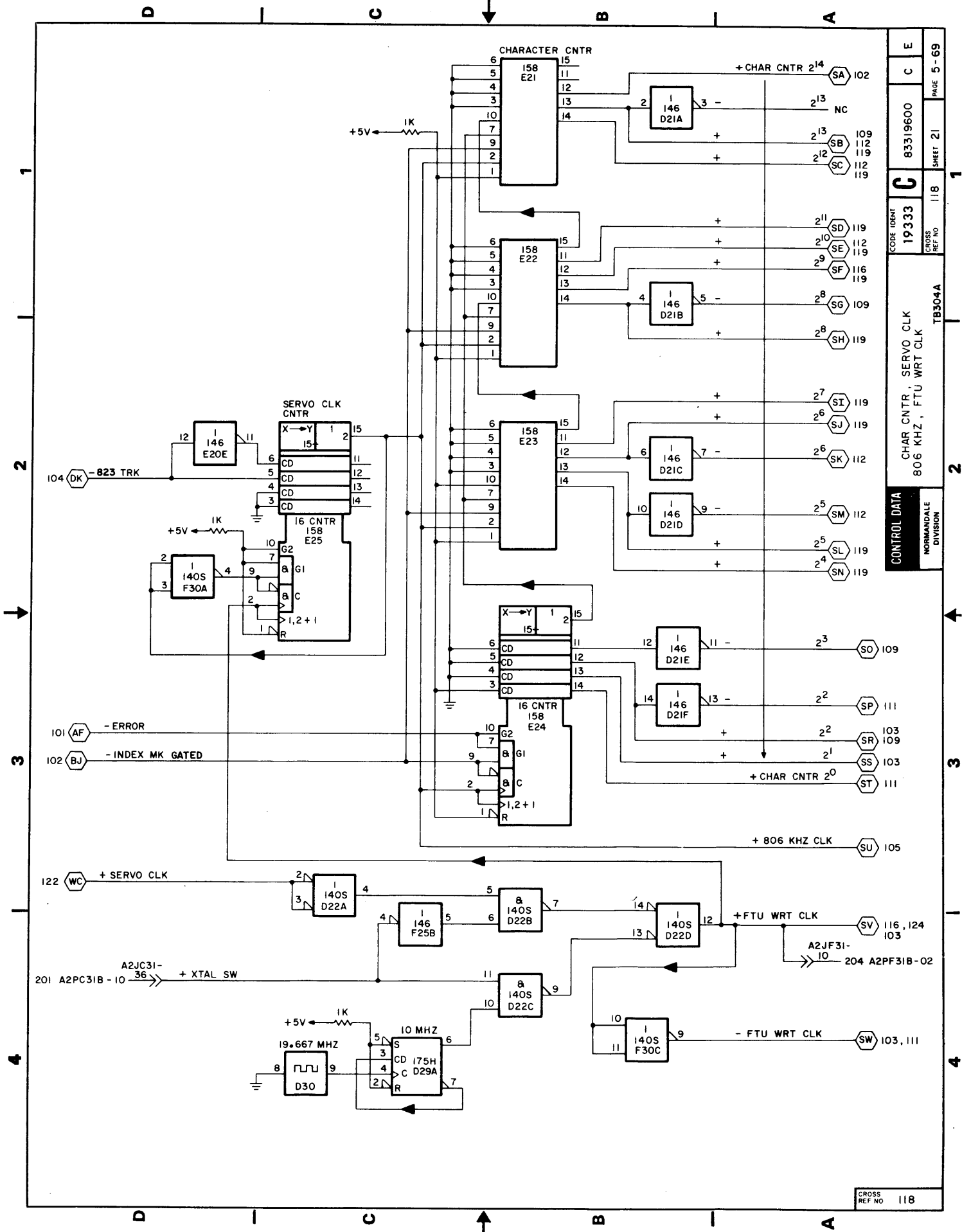
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|---------------------|----------|----------|-----------|
| CODE IDENT | 83319600 | C | A |
| 19333 | | | |
| CROSS REF NO | 115 | SHEET 18 | PAGE 5-66 |
| TB304A | | | |
| RD DATA COMPARE | | | |
| CONTROL DATA | | | |
| NORMANDALE DIVISION | | | |



| | | | |
|--------------------------------------------------|----------|------|----------|
| CODE IDENT | 83319600 | PAGE | 5-67 |
| | 19333 | | SHEET 19 |
| CROSS REF NO | 116 | | |
| CONTROL DATA | | | |
| SERVO CLK, ADRS, AND DATA ERROR DETECTION TB304A | | | |
| NORMANDALE DIVISION | | | |
| CROSS REF NO 116 | | | |



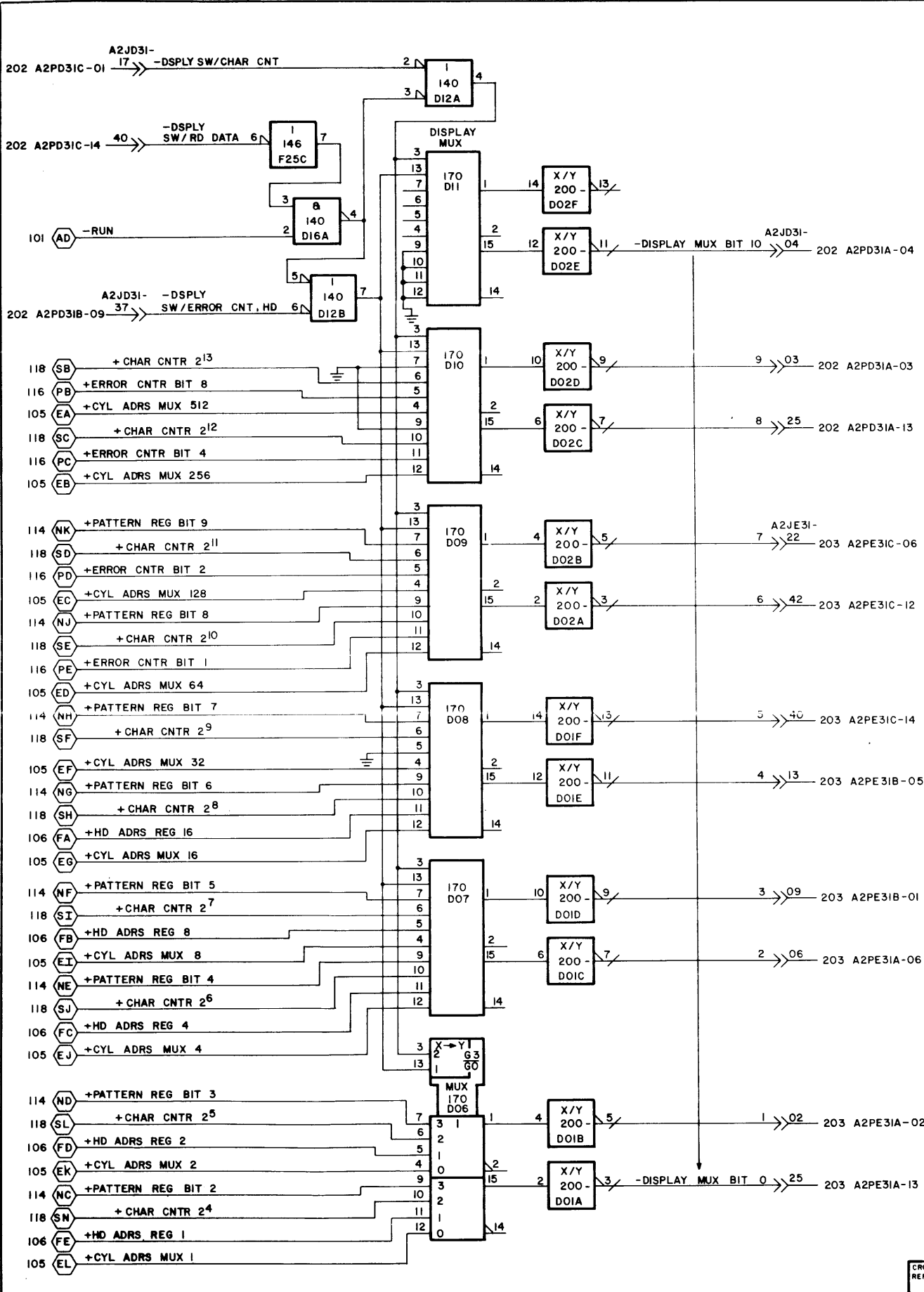
CONTROL DATA
 NORMANDALE DIVISION
 TB304A
 SECTOR COUNTING AND
 ERROR DETECTION
 CODE IDENT 19333
 CROSS REF NO 117
 83319600 C A
 SHEET 20 PAGE 5-68



| | | | |
|----------------------------------------------|----------|----------------------|-----------|
| E | 83319600 | C | PAGE 5-69 |
| | 19333 | | |
| C | 19333 | C | 118 |
| CHAR CNTR, SERVO CLK 806 KHZ, FTU WRT CLK | | TBS004A | |
| CONTROL DATA | | NORMAN DALE DIVISION | |
| CROSS REF NO 118 | | SHEET 21 | |

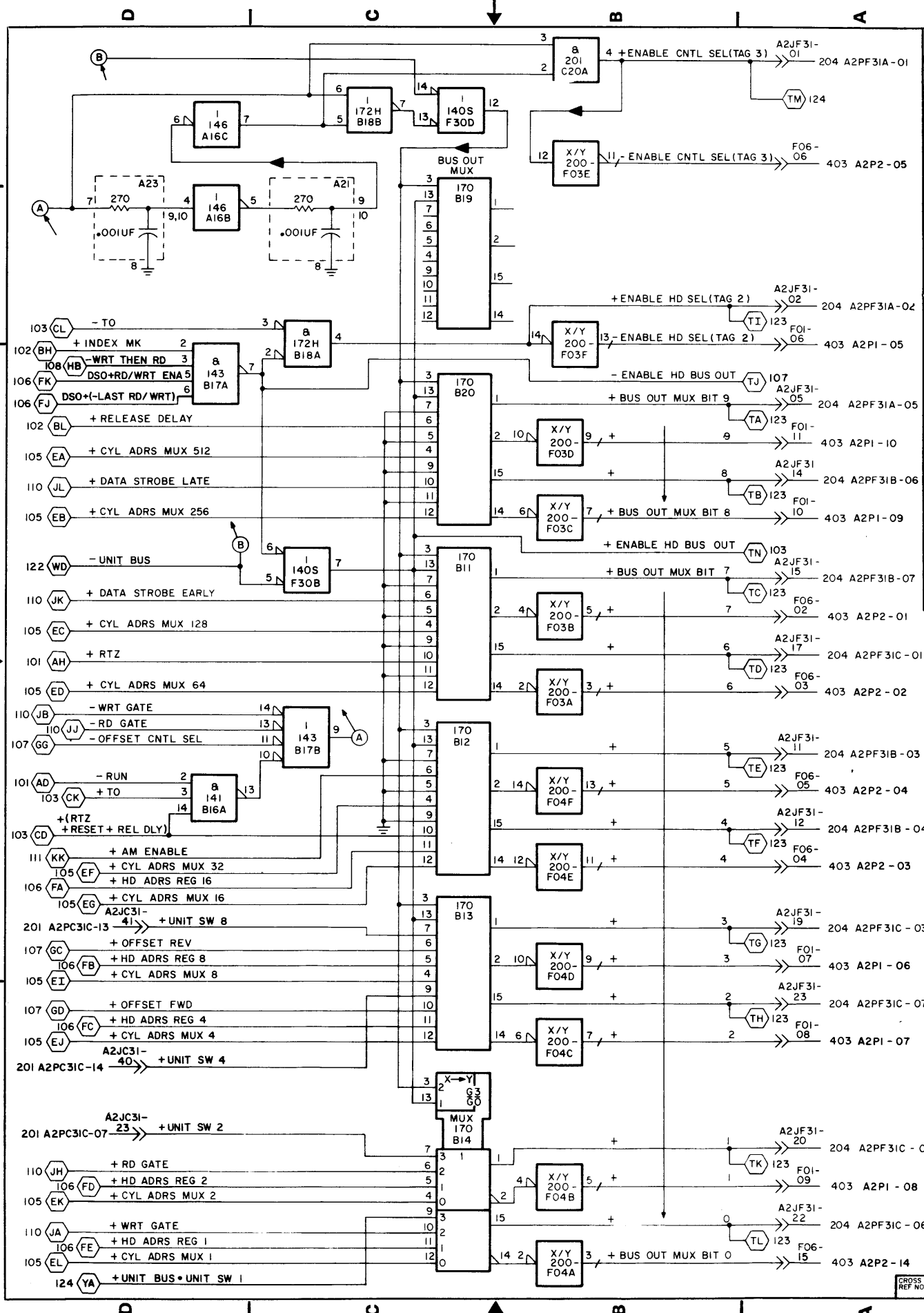
CROSS REF NO 118

D I C B I A



| | | | | | |
|---------------------|--|----------|--|-----------|--|
| CODE IDENT | | D | | F | |
| 19333 | | 83319600 | | PAGE 5-70 | |
| GROSS REF NO | | 119 | | SHEET 22 | |
| TB304A | | | | | |
| DISPLAY MUX | | | | | |
| CONTROL DATA | | | | | |
| NORMANDALE DIVISION | | | | | |
| CROSS REF NO 119 | | | | | |

D I C B I A



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D C B A

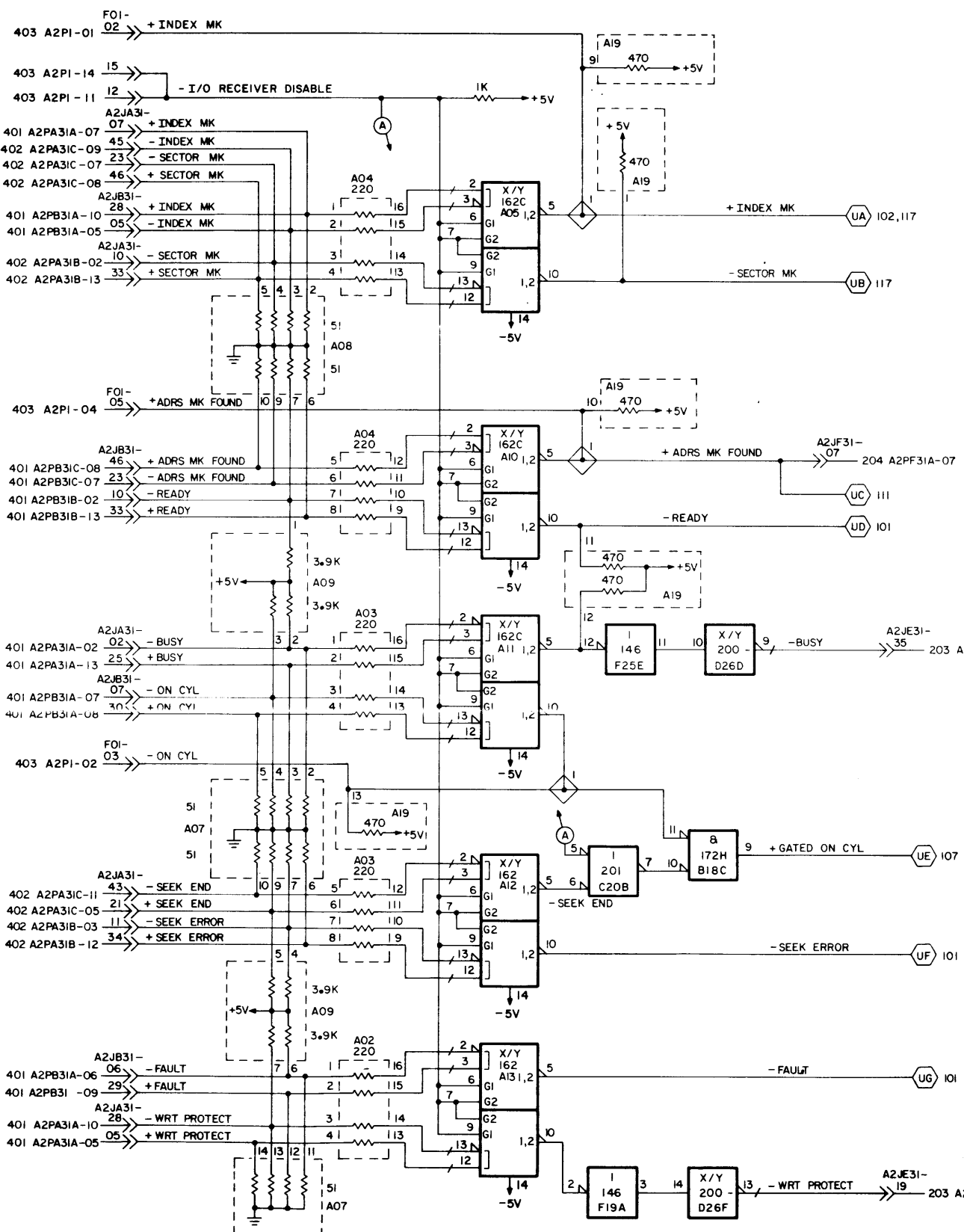
1

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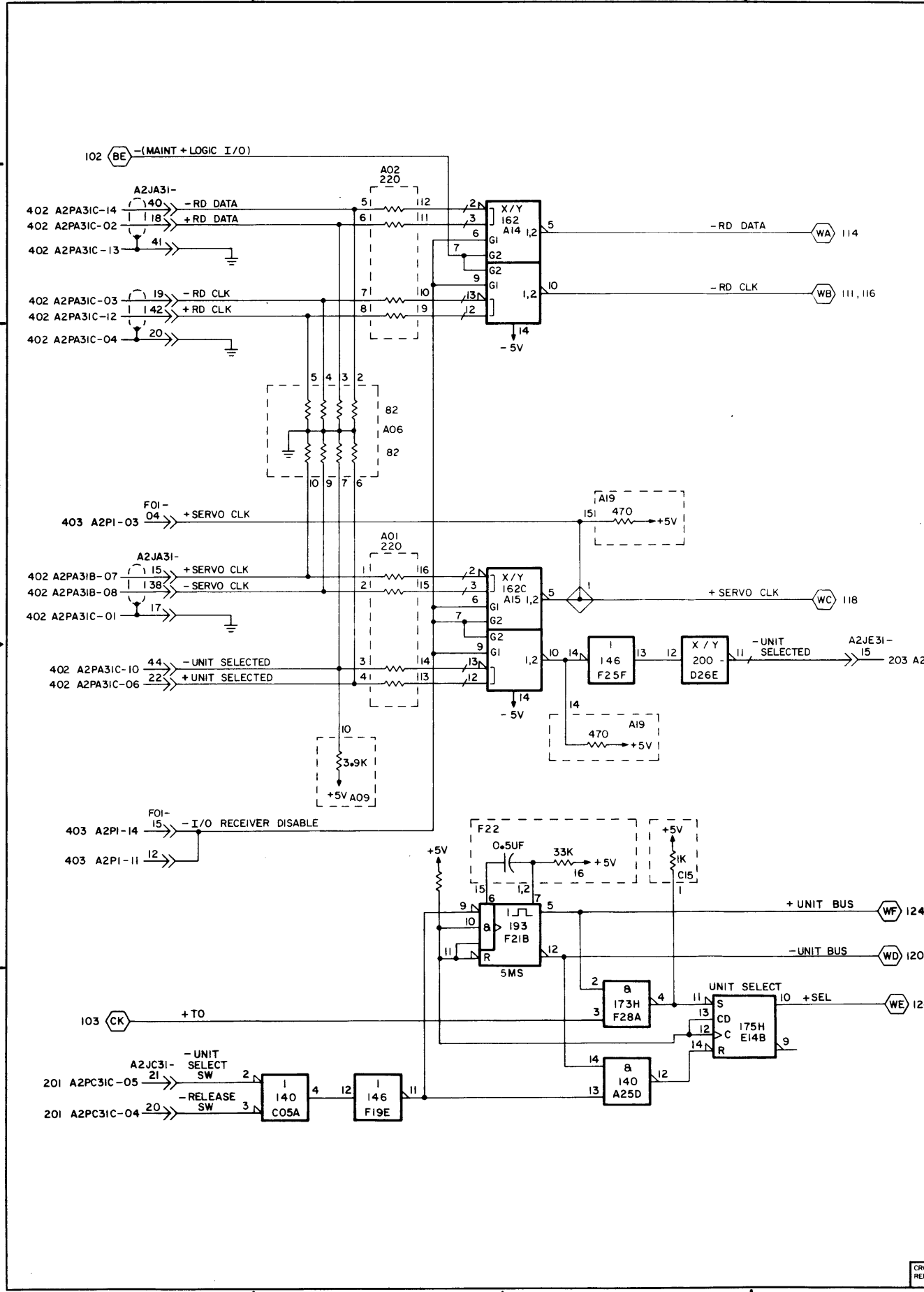
D C B A

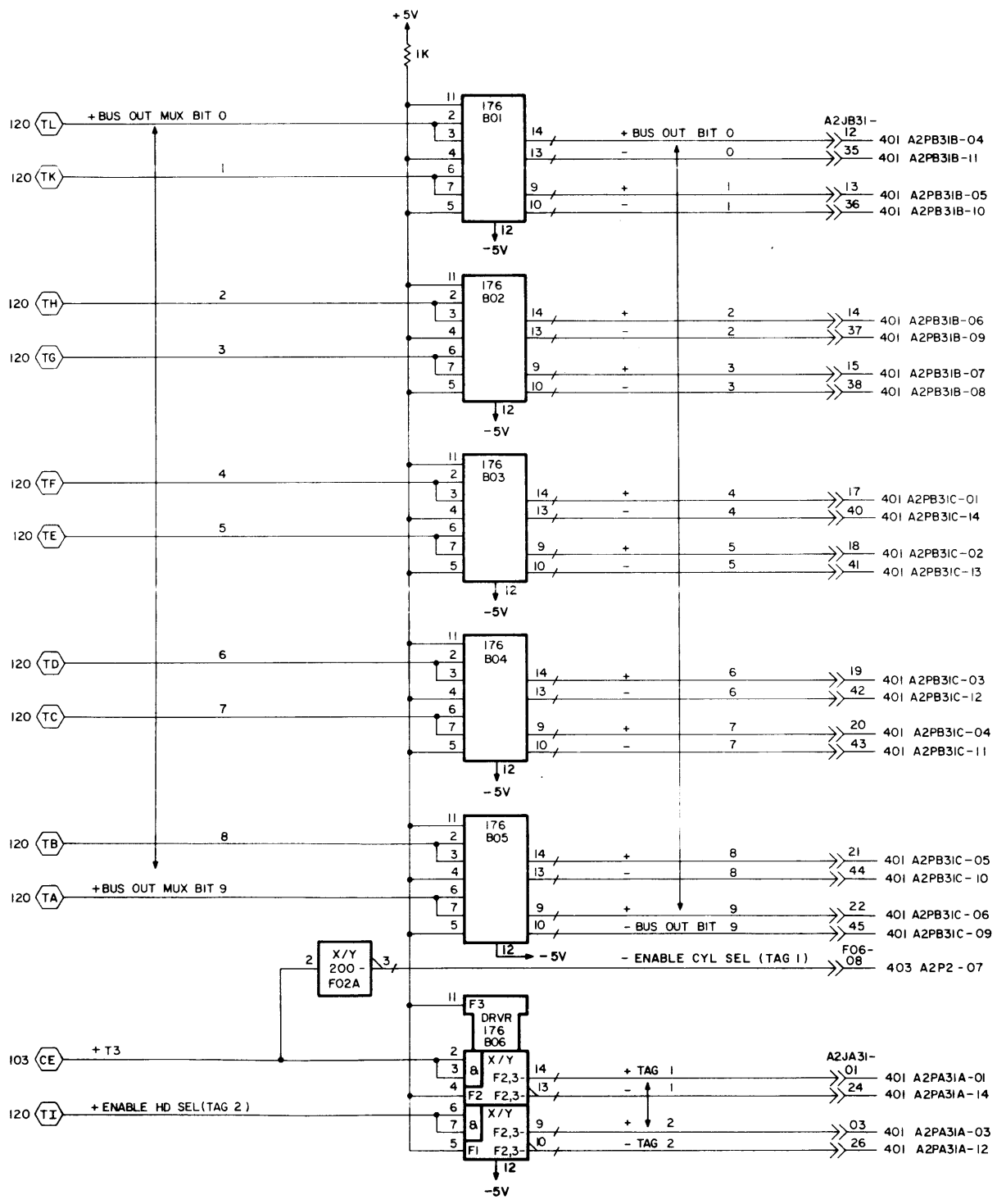


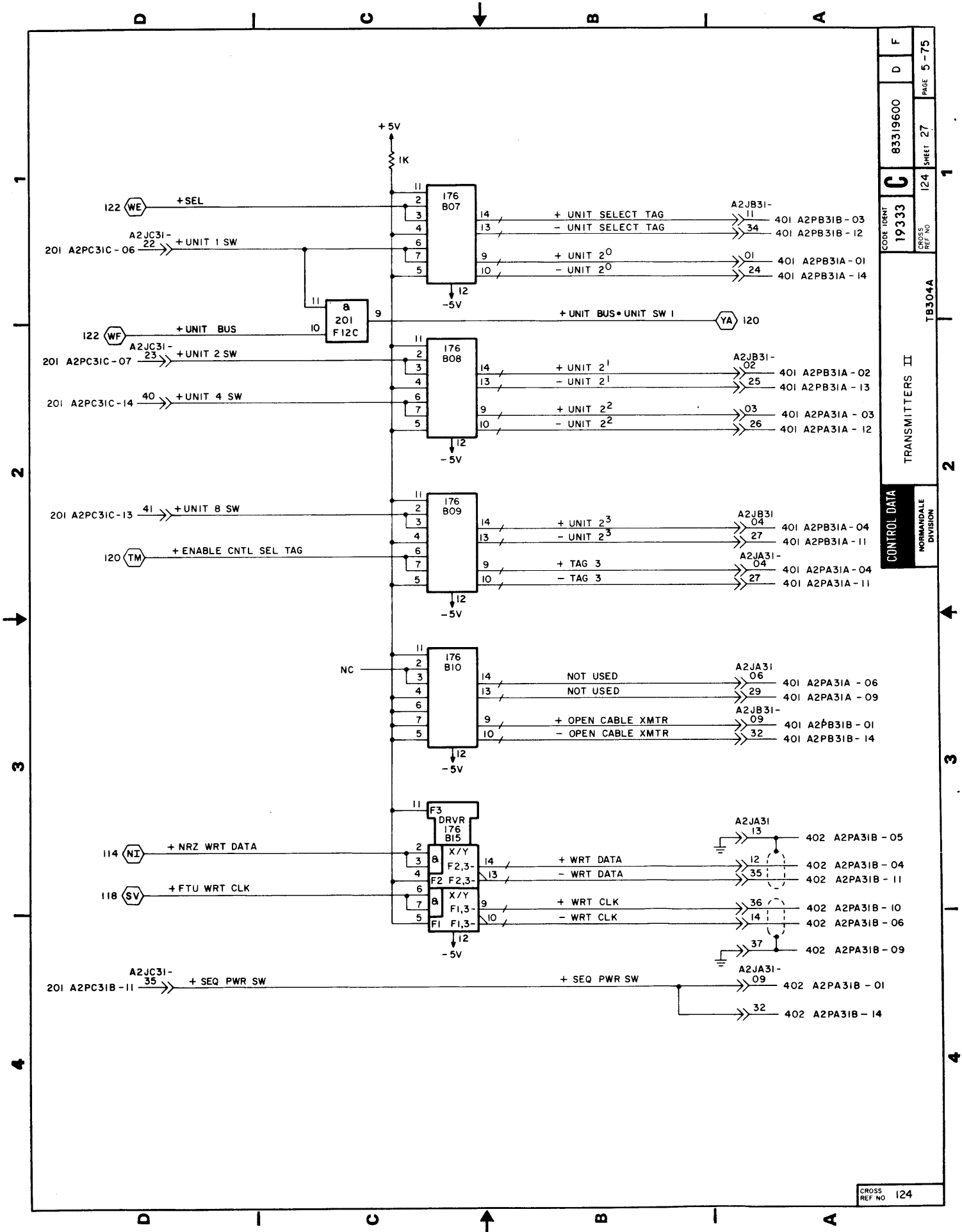
| | | | |
|----------------------|-------|----------|------|
| CODE IDENT | C | C | C |
| CROSS REF NO | 19333 | 83319600 | 5-72 |
| | | PAGE | 24 |
| | | SHEET | 121 |
| TB304A | | | |
| RECEIVERS I | | | |
| CONTROL DATA | | | |
| NORMANDEALE DIVISION | | | |

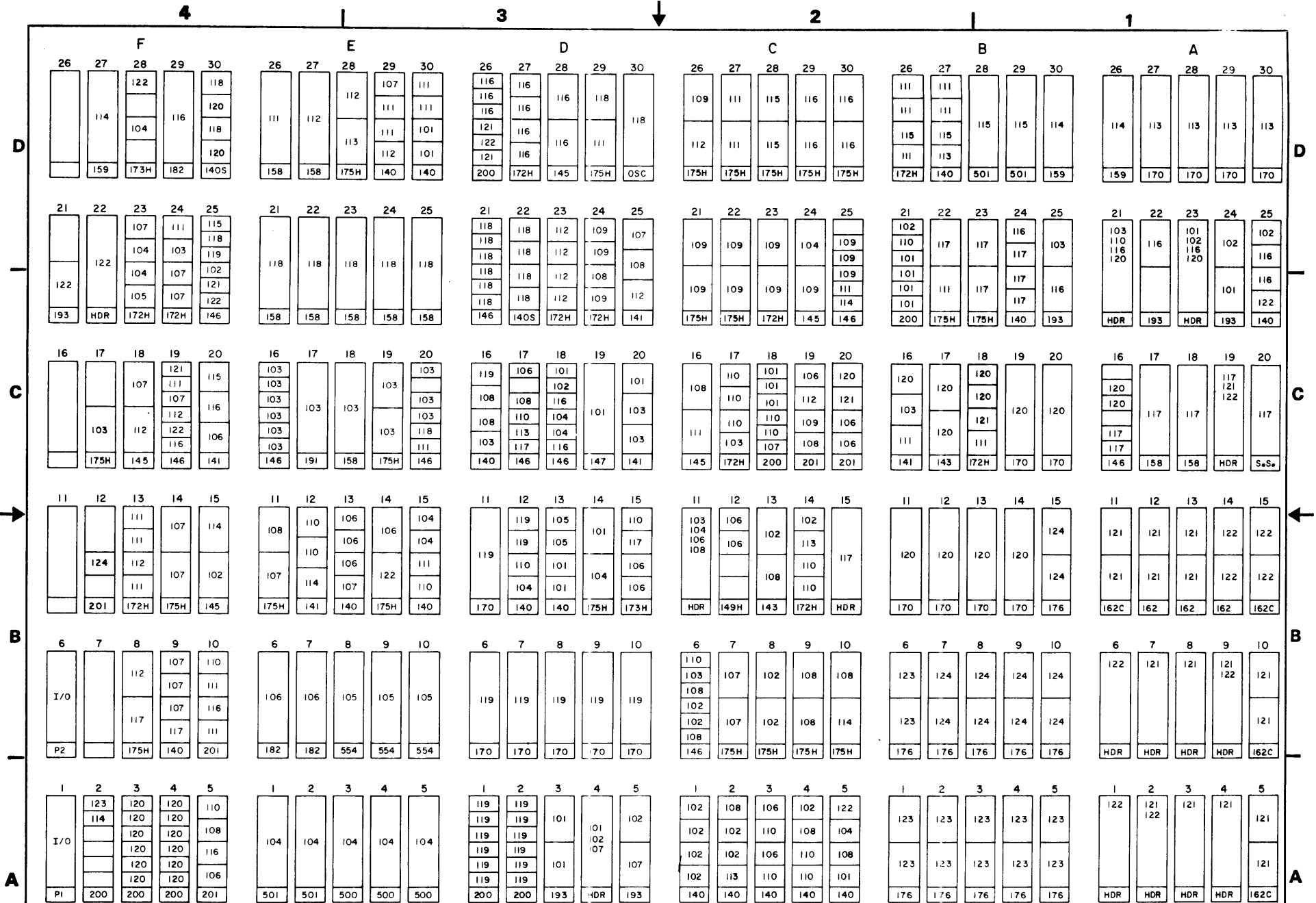
CROSS REF NO 121

D I C B I A









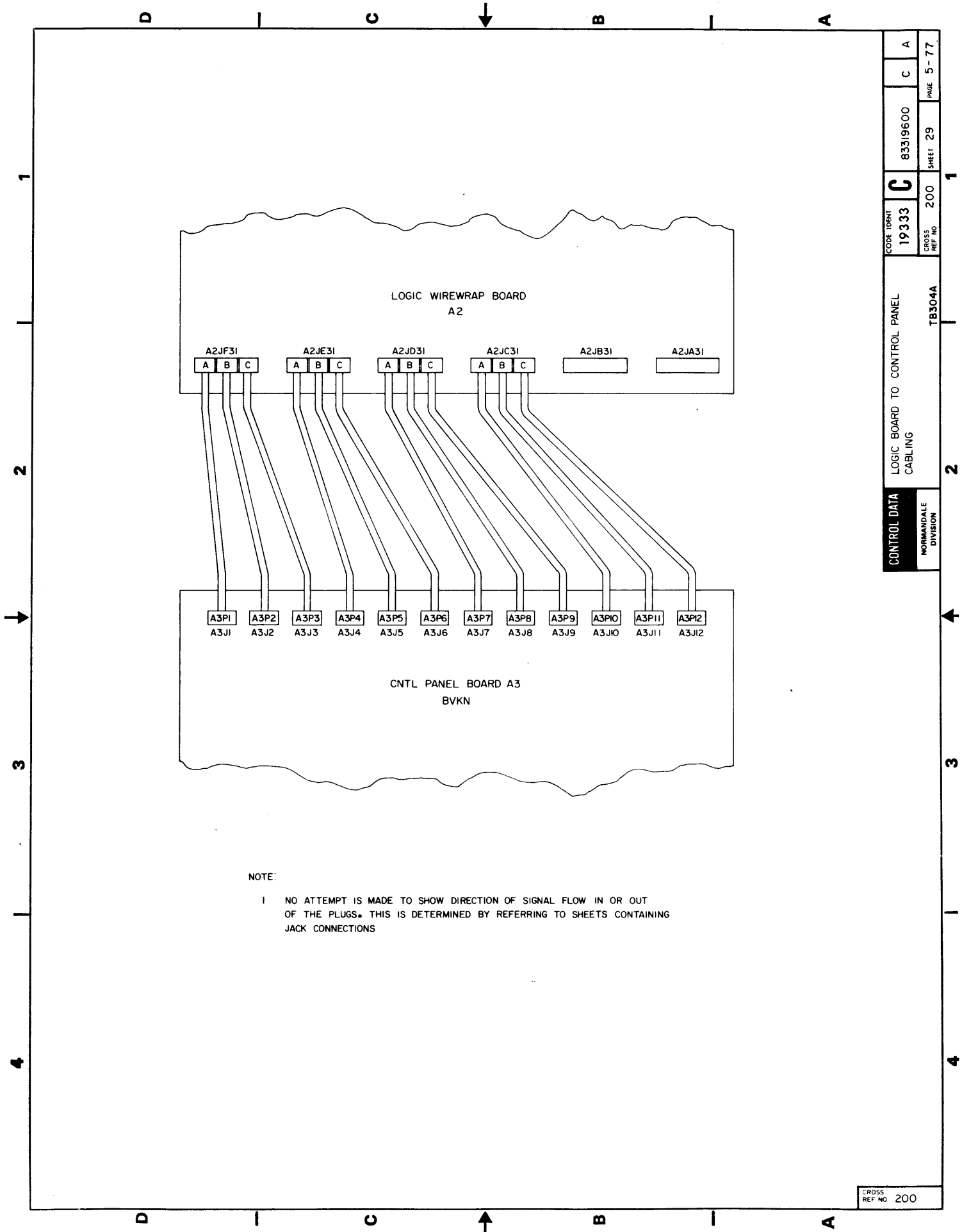
CROSS REF NO 125

NOTES

1. BOTTOM DESIGNATION IN EACH LOCATION IS I.C. TYPE, OTHER NUMBERS ARE LOGIC DIAGRAM CROSS-REFERENCE PAGES WHERE CIRCUIT SECTION IS SHOWN.
2. LOCATIONS OR I.C. SECTIONS THAT ARE UNUSED ARE LEFT BLANK

3. MISCELLANEOUS DESIGNATIONS:
 HDR = RESISTOR HEATER
 OSC = CRYSTAL OSCILLATOR
 S.S.S. = SECTOR SWITCHES (8)
 I/O = I/O BYPASS CONNECTOR

| | | | | | | | | | | | | | |
|---------------------|--|--------------------|--|-----------------------|--|------------|-------|-------------|---|----------|--|---|---|
| CONTROL DATA | | LOGIC BOARD | | I.C. PLACEMENT | | CODE IDENT | 19333 | | C | 83319600 | | D | F |
| NORMANDALE DIVISION | | TB304A | | CROSS REF NO 125 | | SHEET 28 | | PAGE 5 - 76 | | | | | |



NOTE:

1 NO ATTEMPT IS MADE TO SHOW DIRECTION OF SIGNAL FLOW IN OR OUT OF THE PLUGS. THIS IS DETERMINED BY REFERRING TO SHEETS CONTAINING JACK CONNECTIONS

| | | | | |
|-----------------------------------------|-------------|---------------|---|---|
| CODE IDENT 19333 | C | 83319600 | C | A |
| CROSS REF NO 200 | SHEET 29 | PAGE 5-77 | | |
| CONTROL DATA | | TB304A | | |
| LOGIC BOARD TO CONTROL PANEL CABLING | | | | |
| NORMANDALE DIVISION | | | | |

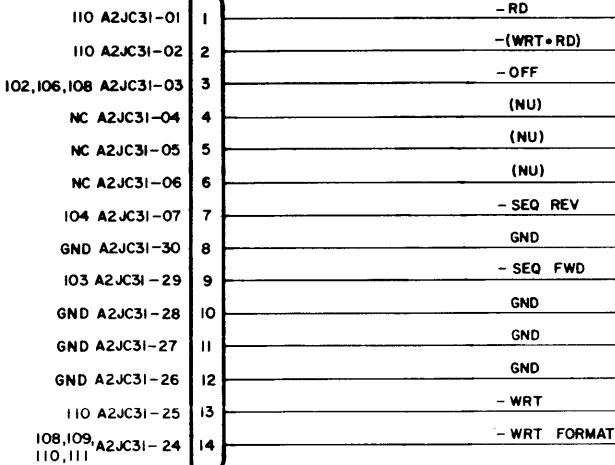
D

C

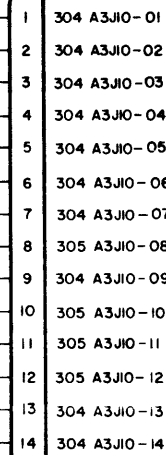
B

A

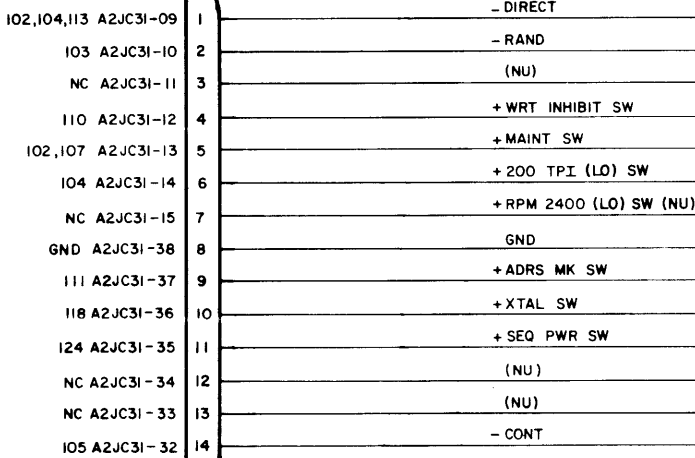
A2PC31A



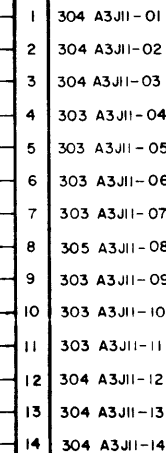
A3P10-



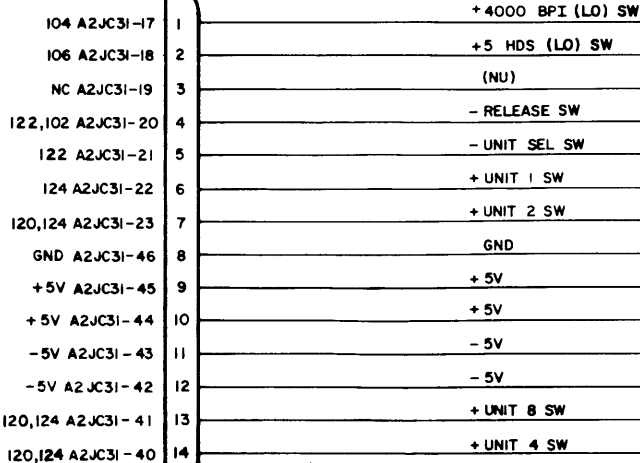
A2PC31B



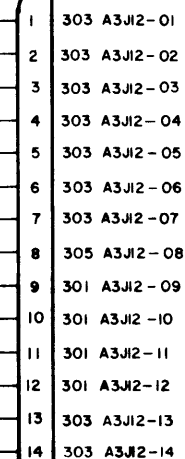
A3P11-



A2PC31C



A3P12-

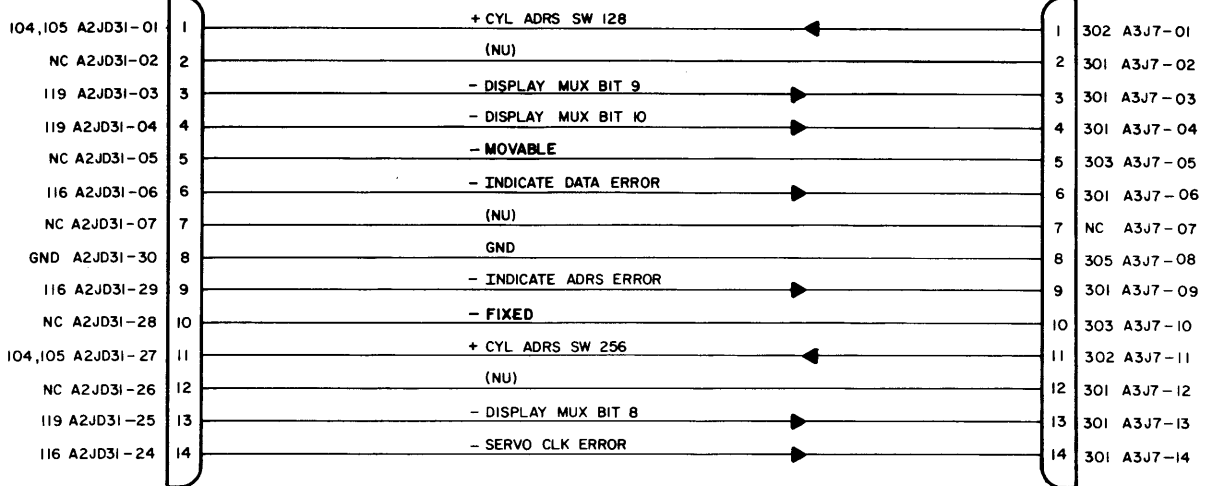


| | |
|---------------------------|----------|
| CODE IDENT | 19333 |
| CROSS REF NO | 201 |
| C | 83319600 |
| D | |
| SHEET | 30 |
| PAGE | 5-78 |
| CONTROL DATA | |
| LOGIC BOARD TO CNTL PANEL | |
| CABLING JC31 TO J10,11,12 | |
| TB304A | |
| NORMANVILLE DIVISION | |

D I C B A

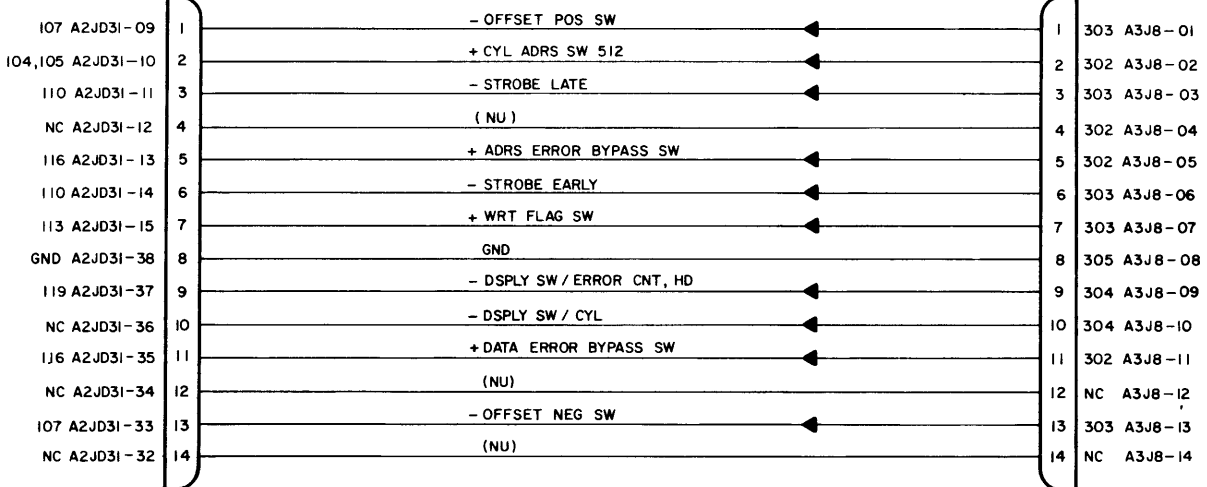
A2PD31A

A3P7-



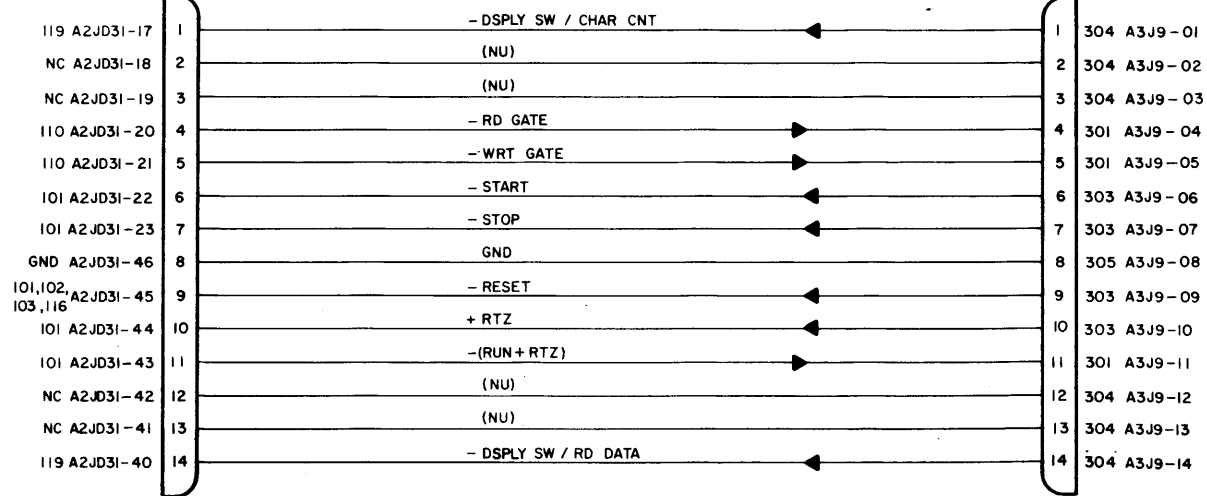
A2PD31B

A3P8-



A2PD31C

A3P9-

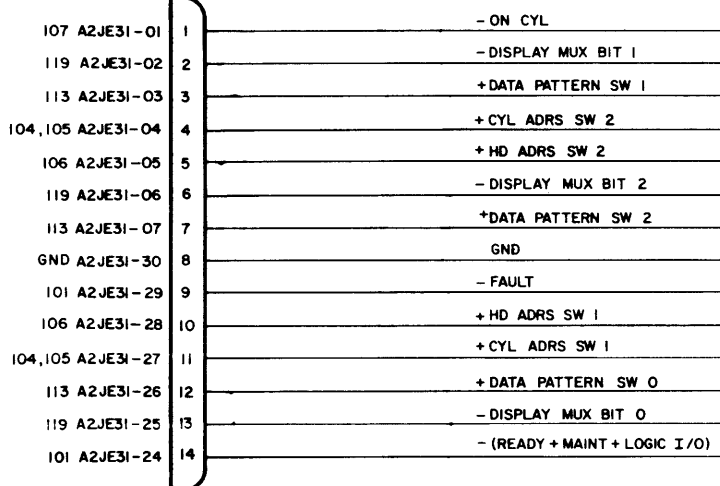


D I C B A

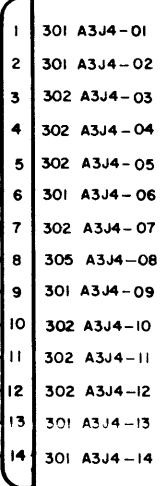
| | | | | | |
|--------------|----------------------------------------------------|----------------|-----|--------|------|
| CODE IDENT | 19333 | CROSS REF. NO. | 202 | PAGE | 5-79 |
| CONTROL DATA | LOGIC BD TO CNTL PANEL CABLING JD31 TO J7, B, 9 | | | SHEET | 31 |
| NORMANDE | DIVISION | | | TB304A | |

D I C B A

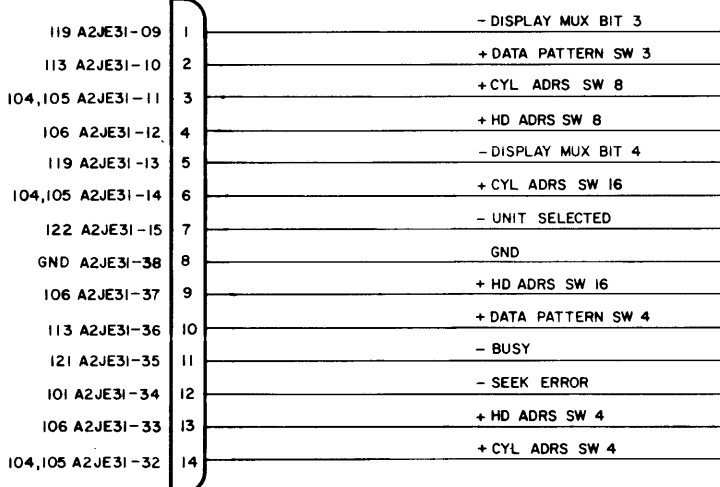
A2PE31A



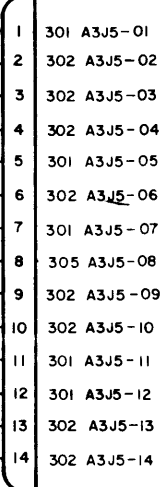
A3P4-



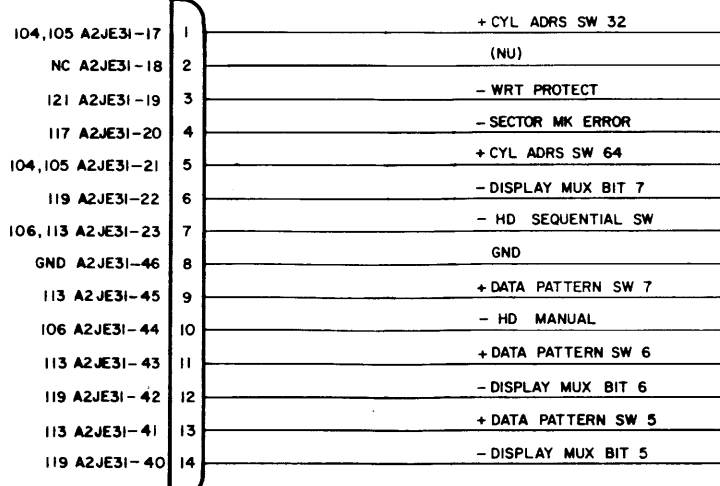
A2PE31B



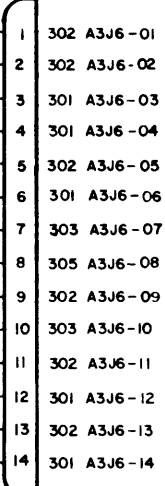
A3P5-



A2PE31C



A3P6-



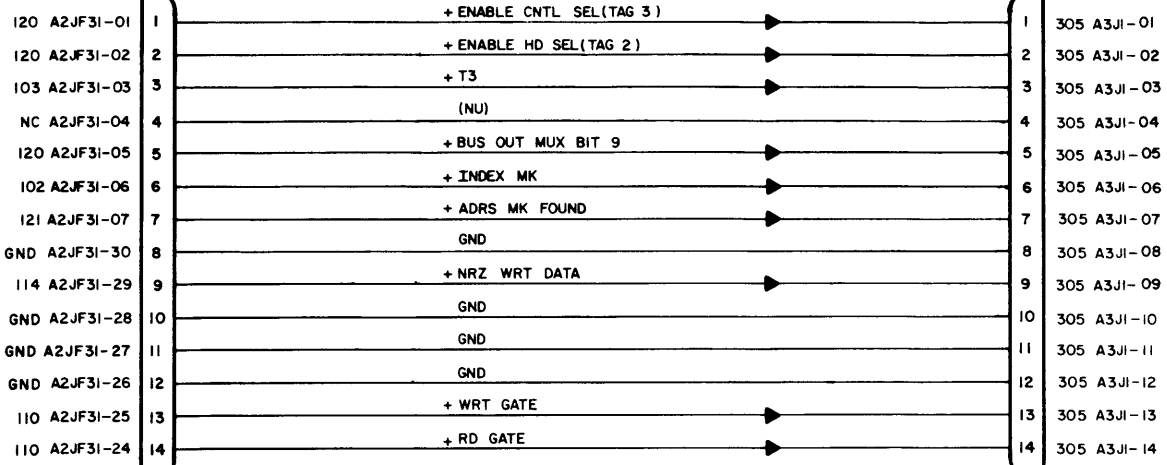
| | | | |
|--------------------------------|-------|-----------|---|
| CODE IDENT | 19333 | C | A |
| CROSS REF NO | 203 | 83319600 | C |
| SHEET | 32 | PAGE 5-80 | |
| CONTROL DATA | | | |
| LOGIC BD TO CNTL PANEL CABLING | | | |
| JE31 TO J4,5,6 | | | |
| T8304A | | | |
| HONOLULU DIVISION | | | |

D I C B A

D I C B A

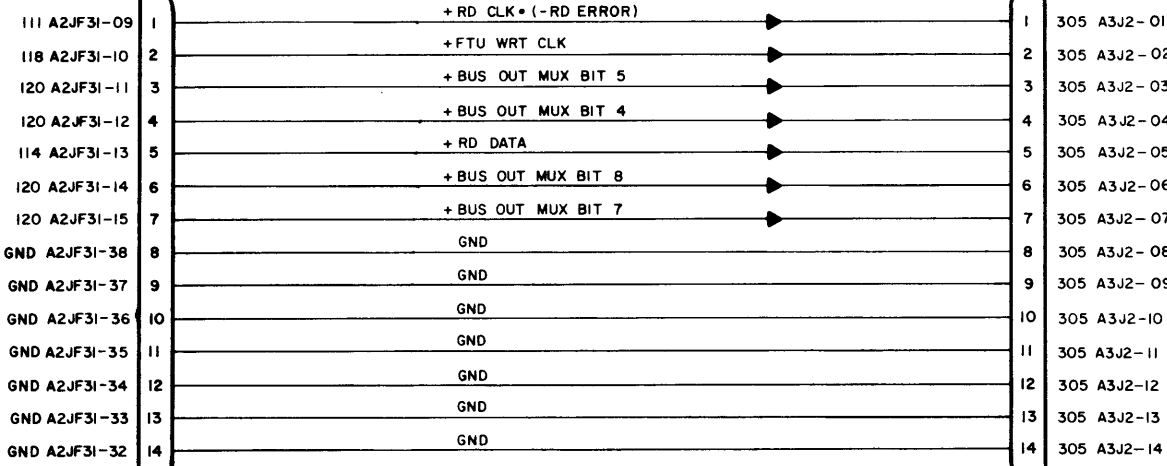
A2PF31A

A3P1 -



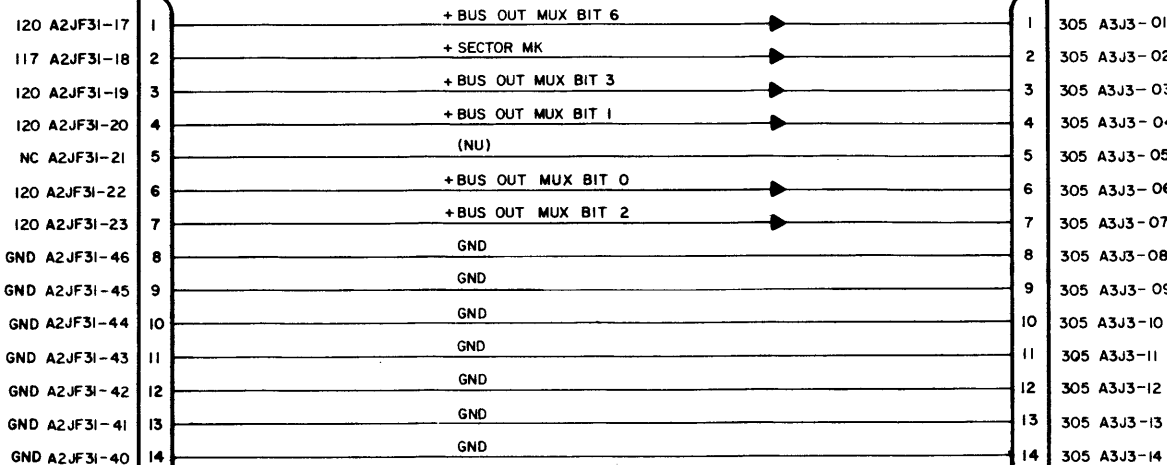
A2PF31B

A3P2 -



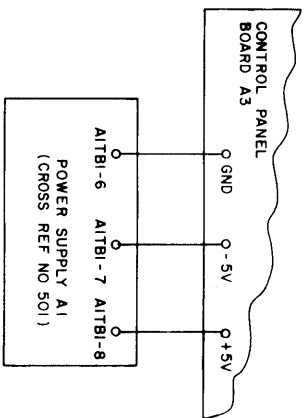
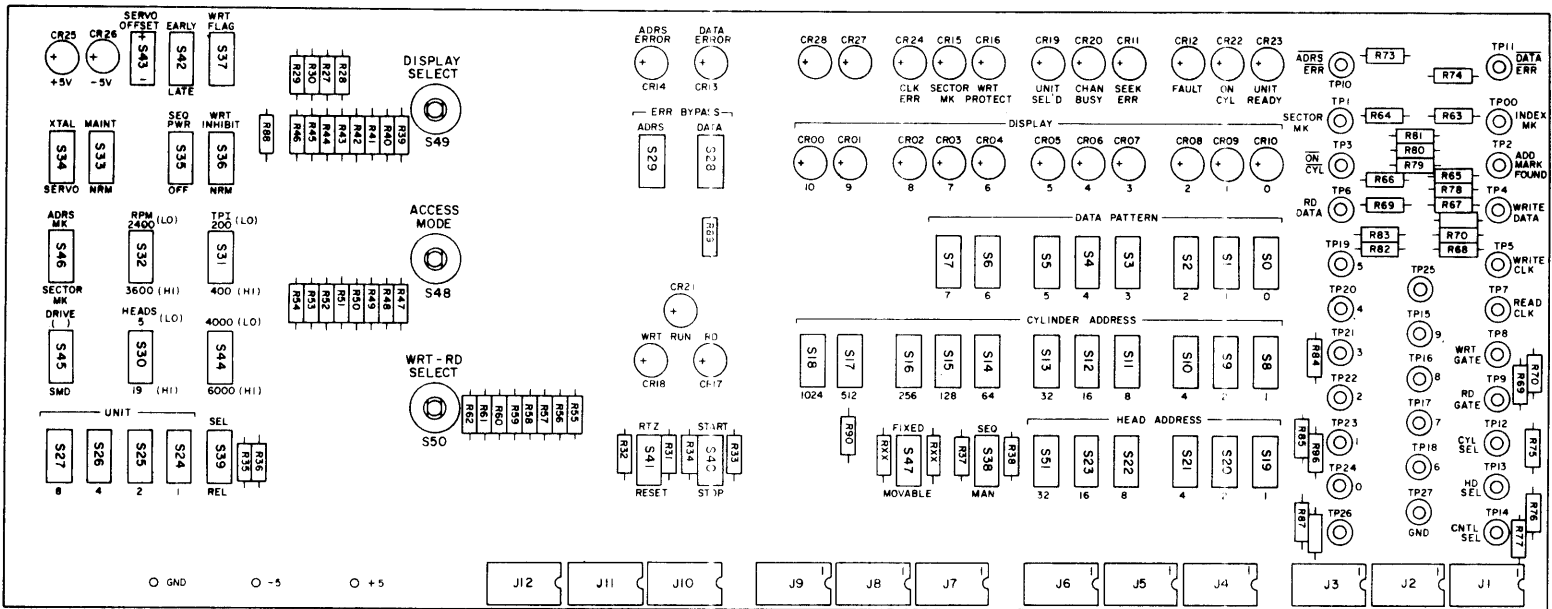
A2PF31C

A3P3 -



D I C B A

| | | | |
|--------------------------------|-------|----------|-----------|
| CODE IDENT | 19333 | C | A |
| CROSS REF NO | 204 | 83319600 | 5-81 |
| CONTROL DATA | | 83319600 | PAGE 5-81 |
| LOGIC BD TO CNTL PANEL CABLING | | 33 | SHEET 33 |
| JF31 TO J1,2,3 | | 204 | |
| NORMANDALE DIVISION | | TB304A | |



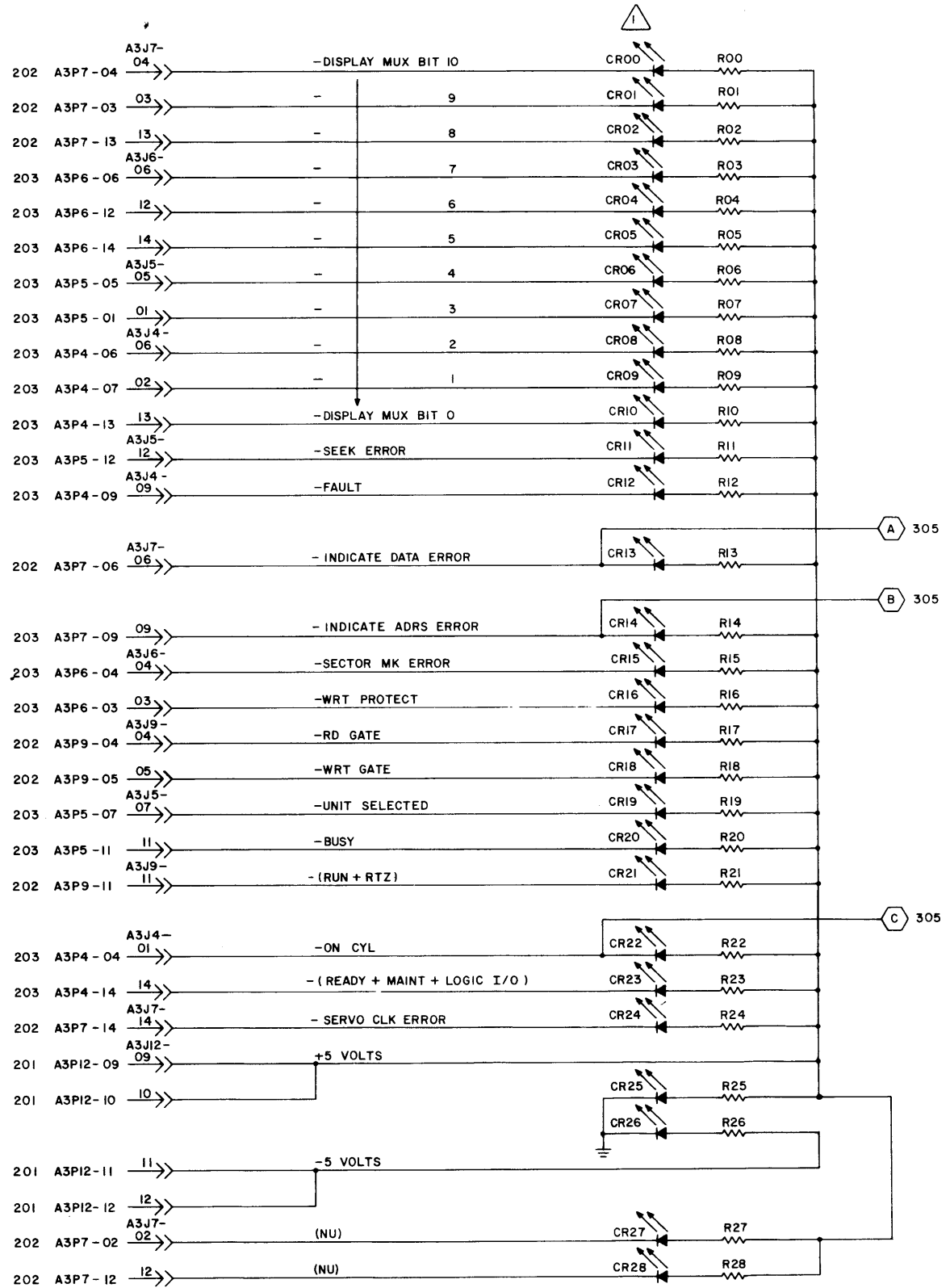
- NOTES:
1. THESE ELEMENTS ARE NOT INSTALLED ON PC BOARD
 2. RESISTORS R02 THRU R06 ARE PART OF THEIR ASSOCIATED LED (CRO2 THRU CRO6)
 3. REFER TO CROSS REF NO 200 FOR CABLES CONNECTING CNTL PANEL TO LOGIC BOARD
 4. POWER AND GROUND CONNECTIONS

CROSS REF NO 300

| | | | | | | | | |
|--------------|---------------------|--------|--------------|-------|-------|----------|-------------|---|
| CONTROL DATA | CONTROL PANEL | | CODE IDENT | 19333 | C | 83319600 | C | A |
| | NORMANDALE DIVISION | TB304A | CROSS REF NO | 300 | SHEET | 34 | PAGE 5 - 82 | |

D I C B I A

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NOTES

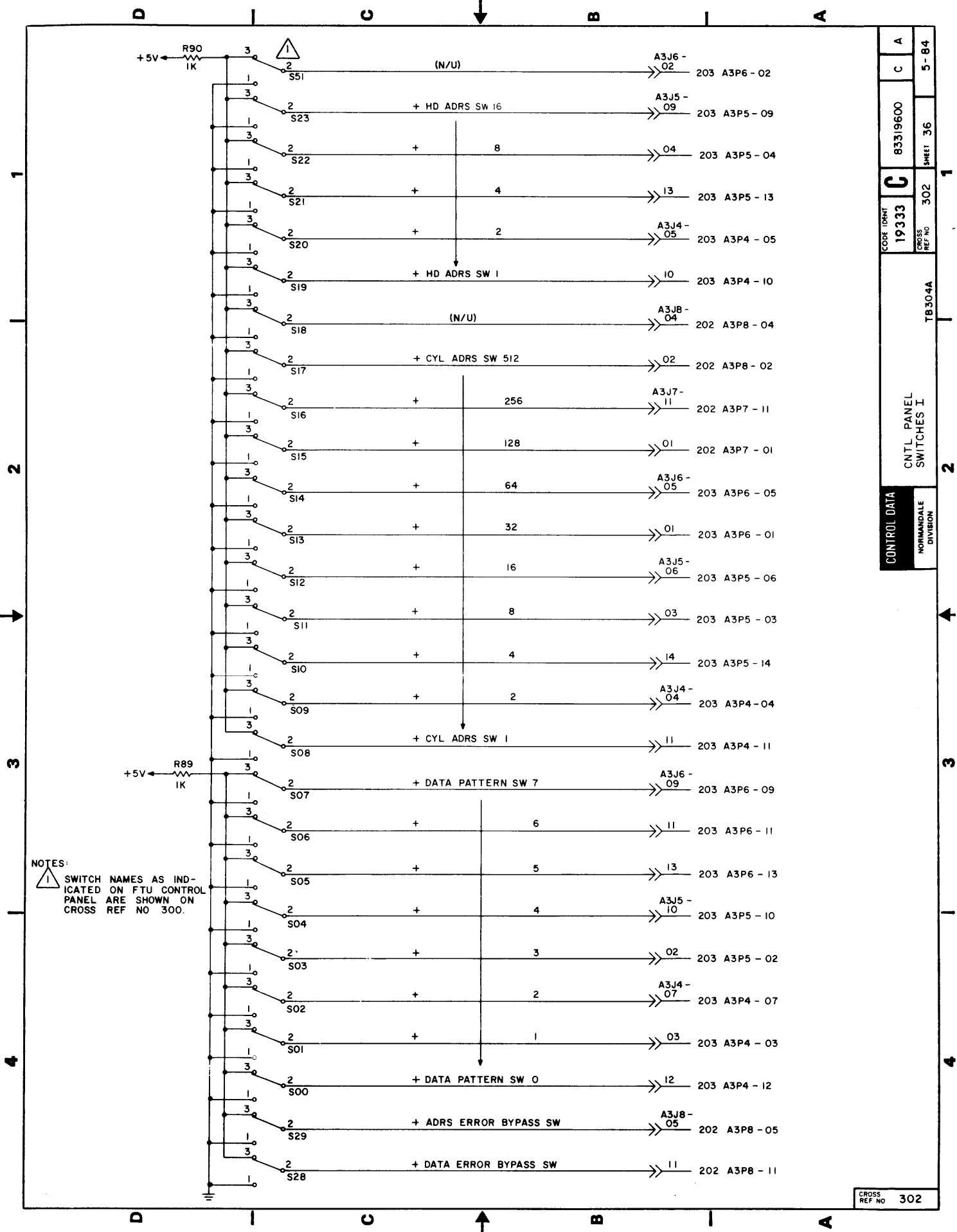
1. INDICATOR NAMES AS SHOWN ON FTU CONTROL PANEL ARE INDICATED ON CROSS REF. NO. 300.

2. RESISTORS R02 THROUGH R26 ARE PART OF THEIR ASSOCIATED LED (CR02 THRU CR26).

| | | | |
|---------------------------------|----------|-------|------|
| CODE IDENT | 83319600 | PAGE | 5-83 |
| CROSS REF NO | 19333 | SHEET | 35 |
| TB304A | | | |
| CONTROL PANEL INDICATORS (LEDS) | | | |
| NORMANDE DIVISION | | | |

CROSS REF NO 301

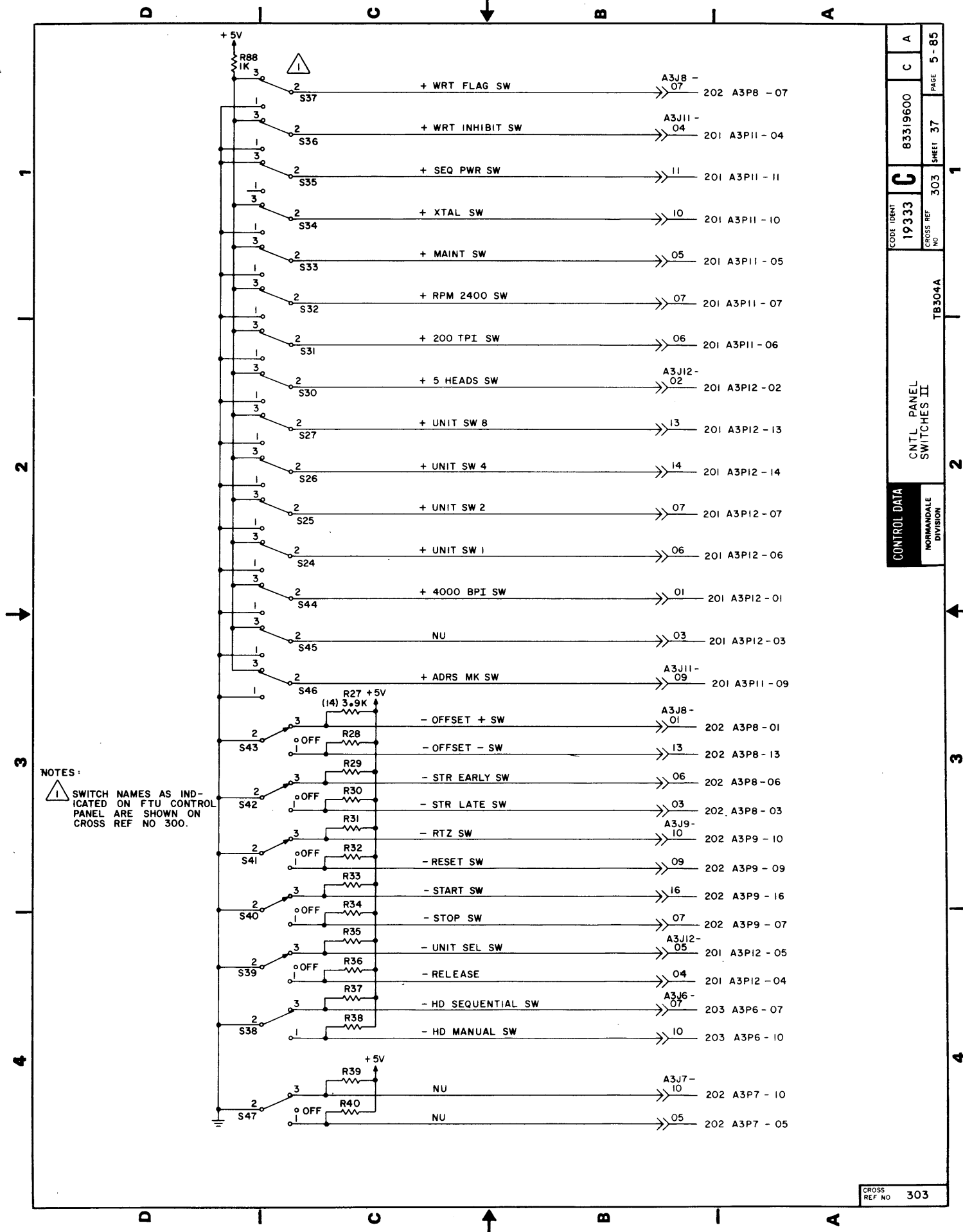
D I C B I A



NOTES:
 SWITCH NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

| | | |
|-----------------------|------------------|----------|
| CONTROL DATA | 83319600 | A |
| NORMANDALE DIVISION | 19333 | C |
| CNTL PANEL SWITCHES I | CROSS REF NO 302 | SHEET 36 |
| TB304A | 5-84 | |

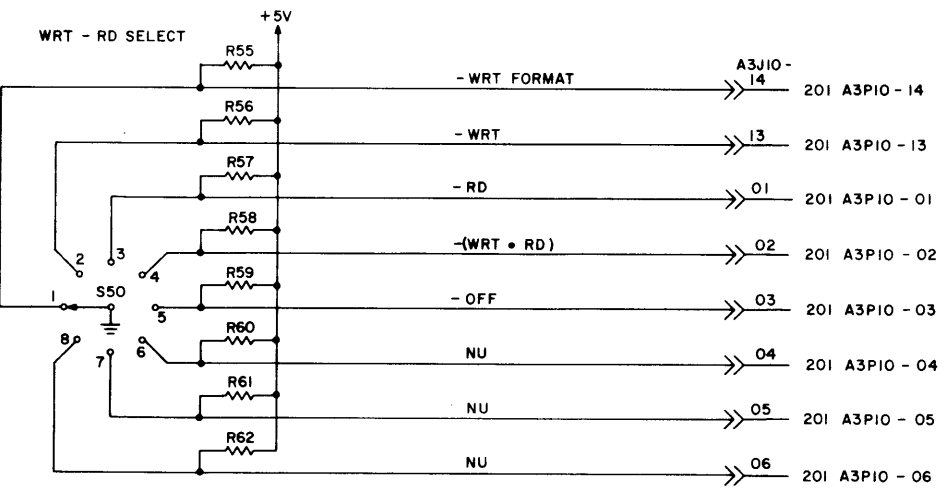
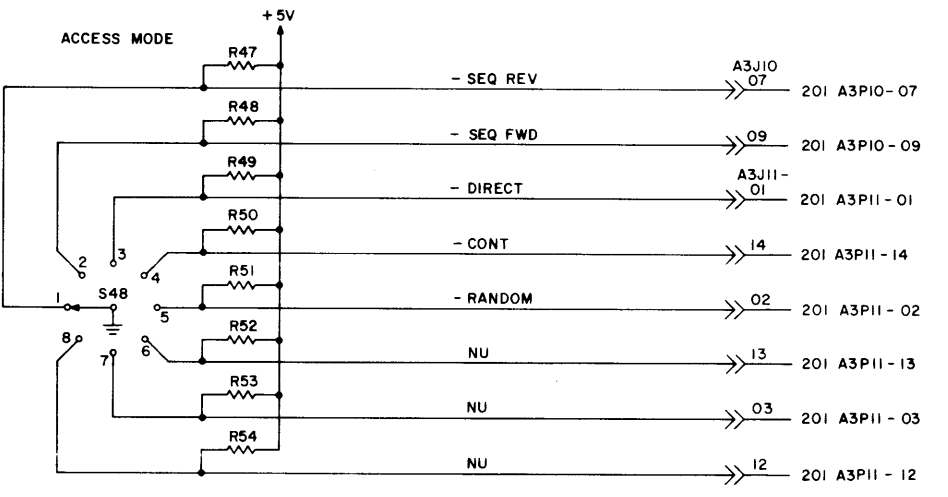
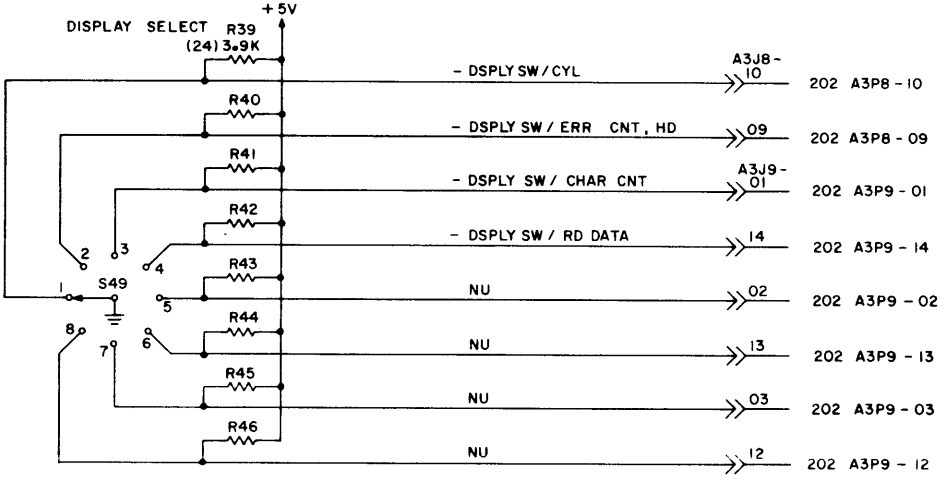
CROSS REF NO 302



| | | | | |
|------------------------|---------------------|--------------|-------|------|
| CONTROL DATA | CODE IDENT | CROSS REF NO | SHEET | PAGE |
| CNTL PANEL SWITCHES II | 19333 | 83319600 | 37 | 5-85 |
| | NORMANDALE DIVISION | | | |
| TB304A | | | | |

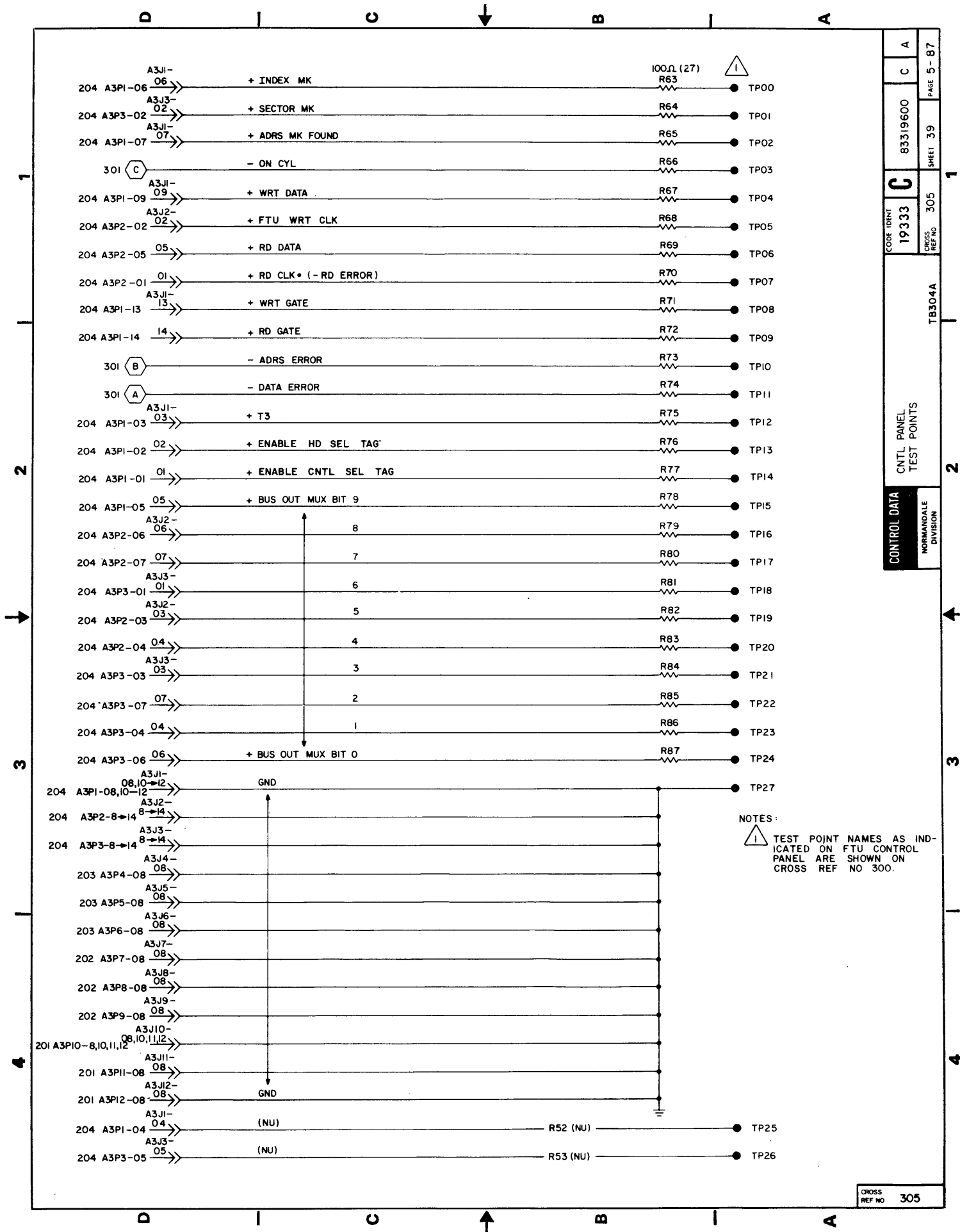
NOTES:
 1 SWITCH NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

D | | C | | B | | A



D | | C | | B | | A

| | | | |
|--------------------------|----------|-------------|----|
| CODE IDENT | 83319600 | D | F |
| 19333 | | | |
| CROSS REF NO | 304 | SHEET | 38 |
| CONTROL DATA | | PAGE 5 - 86 | |
| NORMANDEALE DIVISION | | TB304A | |
| CNTL. PANEL SWITCHES III | | | |



| | | | |
|------------------------|----------|--------|---|
| CODE IDENT | 83319600 | C | A |
| CROSS REF NO | 19333 | C | A |
| CROSS REF NO | 305 | C | A |
| CONTROL DATA | | TBS04A | |
| CNTL PANEL TEST POINTS | | TBS04A | |
| NORMANDEALE DIVISION | | TBS04A | |

NOTES:
 ⚠ TEST POINT NAMES AS INDICATED ON FTU CONTROL PANEL ARE SHOWN ON CROSS REF NO 300.

D C B A

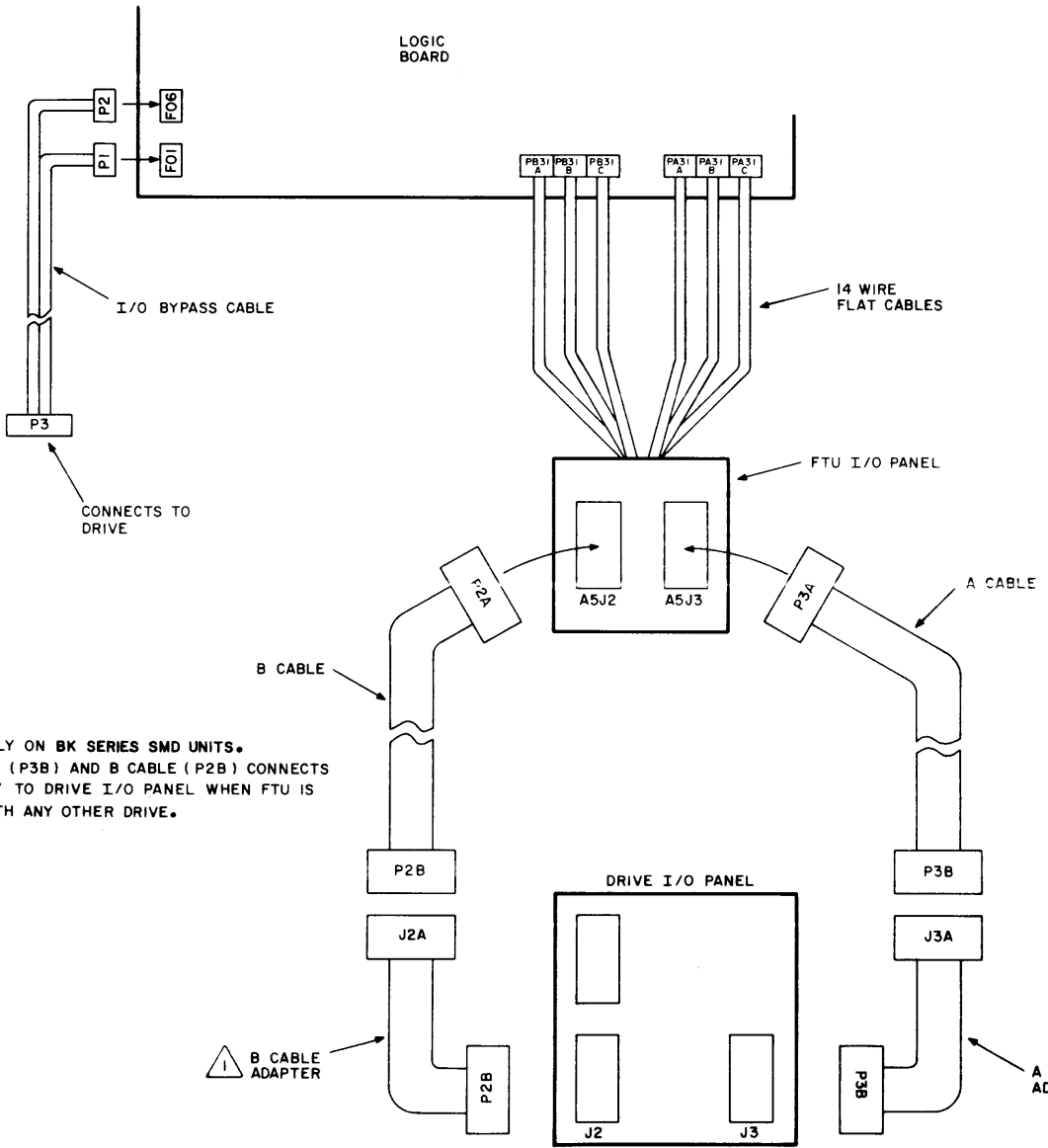
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| | | | | | |
|----------------------------------------|-----------------------|--------------|----------|-------|-----------|
| CONTROL DATA NORMANDALE DIVISION | I/O CABLING TB304A | CODE IDENT | 83319600 | C | A |
| | | 19333 | | | |
| | | CROSS REF NO | 400 | SHEET | 40 |
| | | | | | PAGE 5-88 |



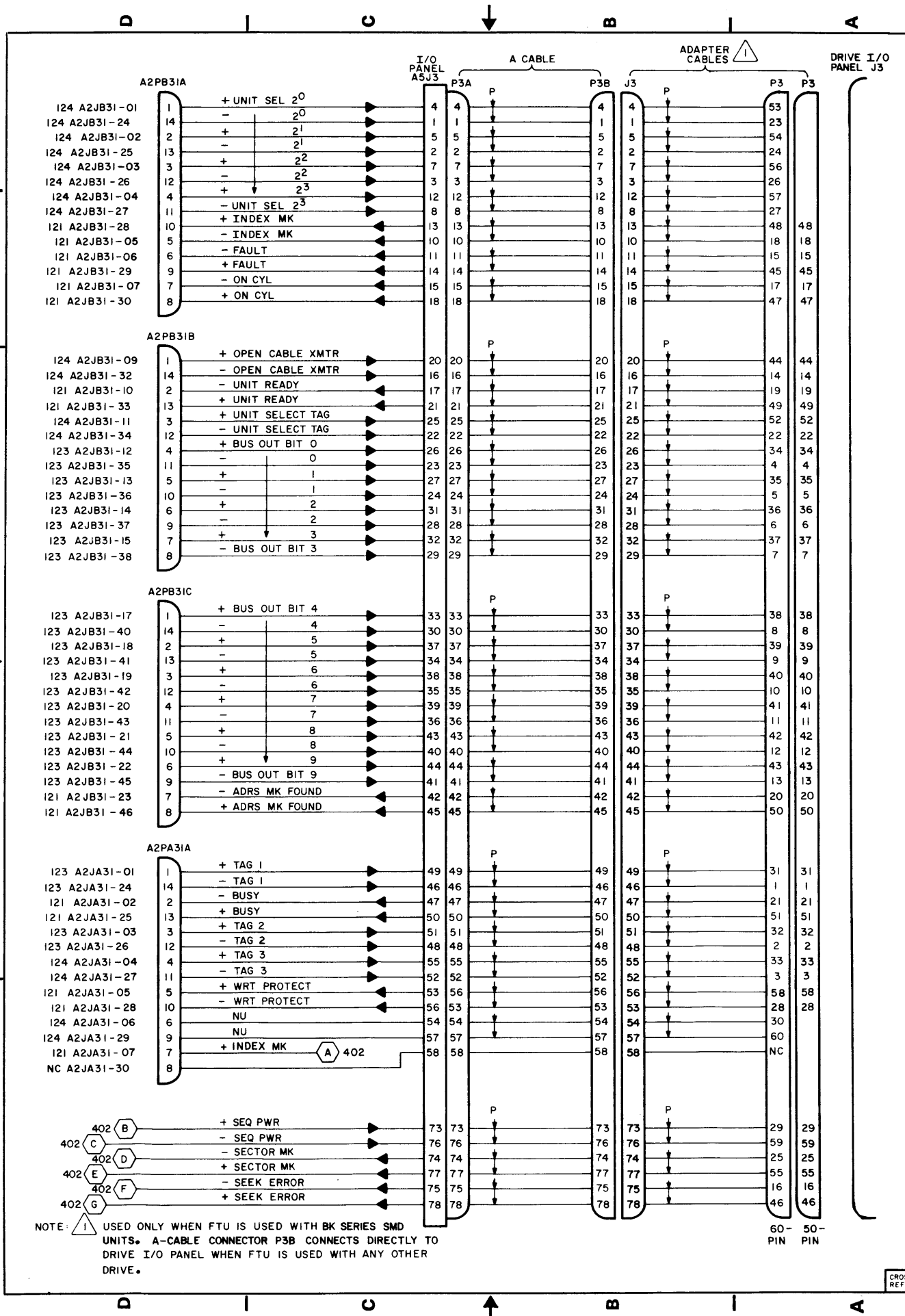
NOTES:

- 1 USED ONLY ON BK SERIES SMD UNITS.
- A CABLE (P3B) AND B CABLE (P2B) CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

1 B CABLE ADAPTER

1 A CABLE ADAPTER

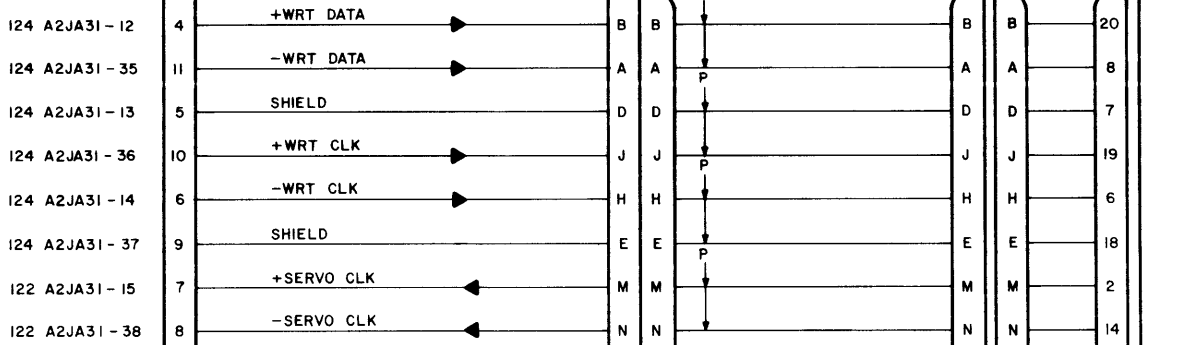
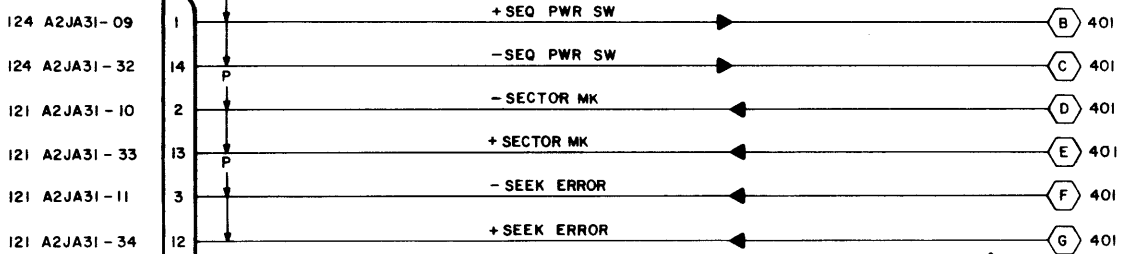
D C B A



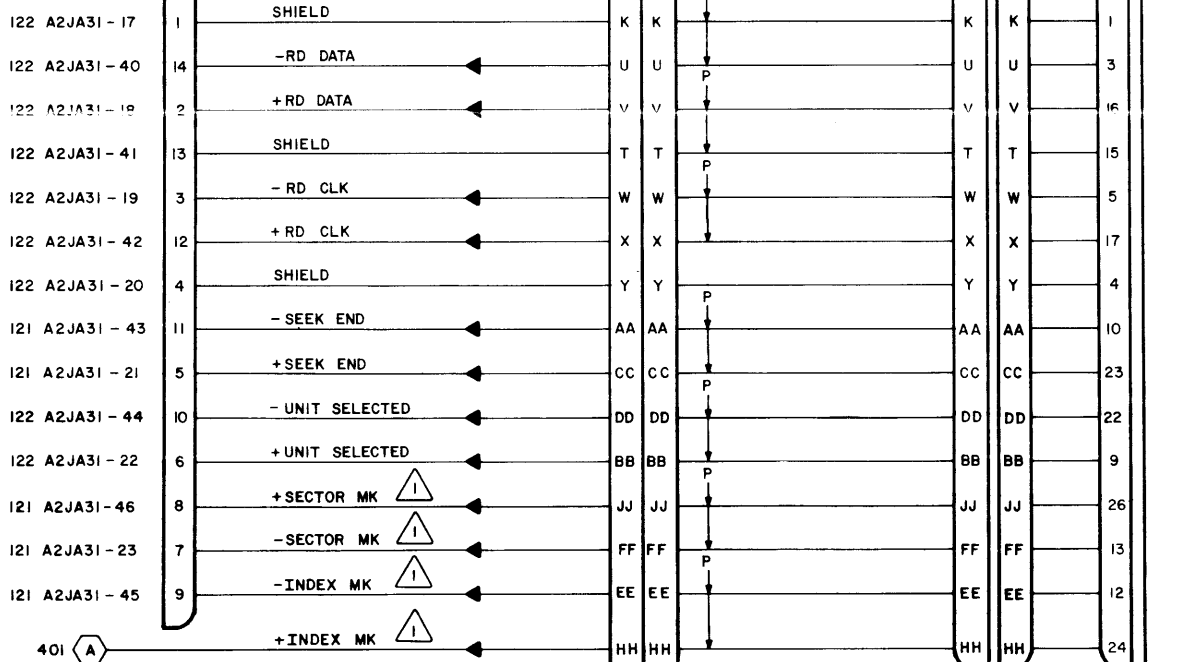
NOTE: I USED ONLY WHEN FTU IS USED WITH BK SERIES SMD UNITS. A-CABLE CONNECTOR P3B CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

D I C B A

A2PA31B



A2PA31C



NOTES:
 ⚠ USED ONLY WHEN FTU IS USED WITH BK SERIES SMD UNITS. B-CABLE CONNECTOR P2B CONNECTS DIRECTLY TO DRIVE I/O PANEL WHEN FTU IS USED WITH ANY OTHER DRIVE.

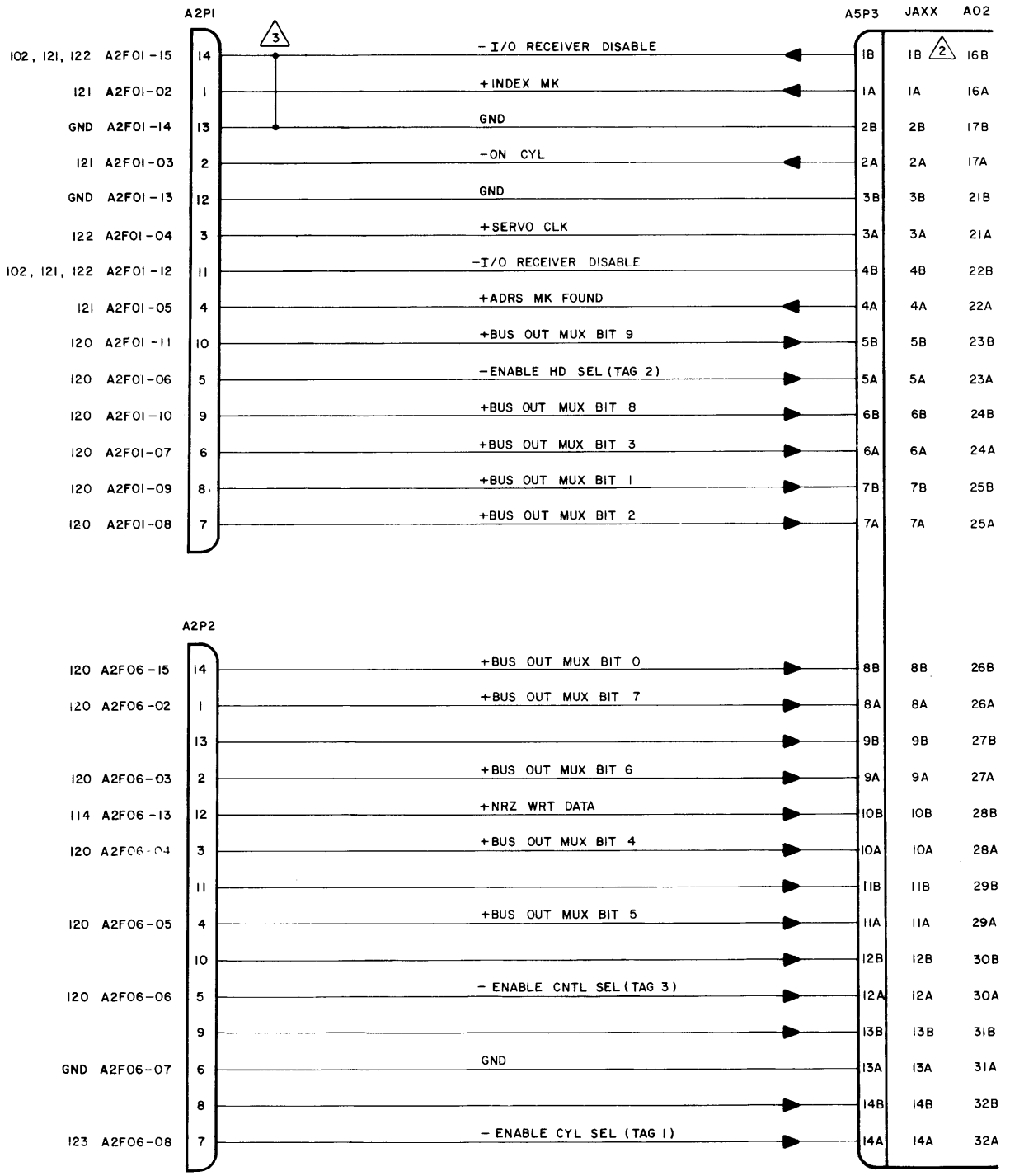
| | | | |
|----------------------|----------|-----------------------|------|
| CODE IDENT | 19333 | C | A |
| CROSS REF NO | 83319600 | C | 5-90 |
| REF NO | 402 | SHEET | 42 |
| CONTROL DATA | | B CABLE, CONNECTOR J2 | |
| NORMAN DALE DIVISION | | TB304A | |

D I C B A

D I C B A

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|---------------------|----------|------------------|------|
| CODE IDENT | 83319600 | PAGE | 5-91 |
| 19333 | C | CROSS REF NO | 403 |
| CONTROL DATA | | I/O BYPASS CABLE | |
| NORMANDALE DIVISION | | TBS04A | |
| SHEET 43 | | SHEET 43 | |



DRIVE BACKPANEL

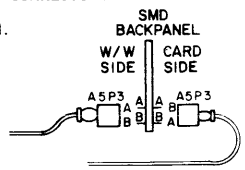
NOTES:

1 DESIGNATION DEPENDS ON SPECIFIC DRIVE. THEY ARE AS FOLLOWS:

- BJ4XX - JA84
- BJ5XX - JA03
- BJ7XX - JA03
- BK4XX - A02
- BK5XX - A02
- BK6XX - JA84
- BK7XX - JA84

3 JUMPER WIRE INSIDE PLUG A2P1.

2 A AND B DESIGNATION REVERSED ON BJ5XX AND BJ7X BECAUSE PLUG CONNECTS TO CARD SIDE ON THESE UNITS.



D I C B A

SECTION 6

WIRE LISTS

INTRODUCTION

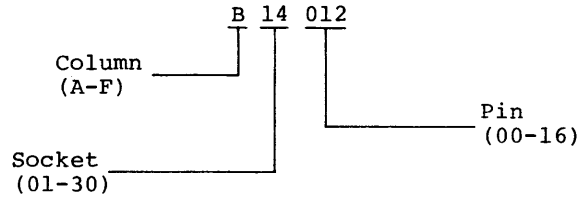
This section contains the Logic-Board wire wrap lists for the TB304B/C and the TB304A. The two lists are identified by yellow divider sheets. The power and control-panel harnesses, as well as the various I/O cables, are fully documented in the diagrams section.

The wire wrap lists are double-ended. That is, each wire is presented twice. Each end of the wire appears once as an origin, and again as a Destination. For example:

| <u>ORIGIN</u> | <u>DESTINATION</u> | <u>Z</u> |
|---------------|--------------------|----------|
| A04013 | C29002 | 1 |
| • | • | |
| • | • | |
| • | • | |
| C29002 | A04013 | 1 |

Each list is arranged alphanumerically by origin, A01001 being the first entry and

JF31029 the last. The location coordinates (Columns A-F, sockets 01-03) and pin numbers are interpreted as shown below.



The pin numbers are those for the 16-pin IC sockets, not for the IC chips themselves. See CR 011 for more information on this matter.

The Z column shows the position of the wire on the wire-wrap pin. Level 1 is the wrap closest to the board surface. Only two wraps are present on any pin.

TB304B/C

WIRE LIST

TITLE LOGIC BOARD WIRE WRAP (TB304B/C)
(REF: 83249903)

WL

DOCUMENT NO.

SHEET NO.
1 of 33

REV.
D

| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------|------------------|------------|
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------|------------------|------------|

| | | |
|--------|---------|---|
| A01001 | JA31015 | 1 |
| A01001 | A06010 | 2 |
| A01002 | JA31038 | 1 |
| A01002 | A06009 | 2 |
| A01003 | JA31044 | 1 |
| A01003 | A06007 | 2 |
| A01004 | JA31022 | 1 |
| A01004 | A06006 | 2 |
| A01013 | A15012 | 1 |
| A01014 | A15013 | 1 |
| A01015 | A15003 | 1 |
| A01016 | A15002 | 1 |
| A02001 | JB31006 | 1 |
| A02001 | A07011 | 2 |
| A02002 | JB31029 | 1 |
| A02002 | A07012 | 2 |
| A02003 | JA31028 | 1 |
| A02003 | A07013 | 2 |
| A02004 | JA31005 | 1 |
| A02004 | A07014 | 2 |
| A02005 | JA31040 | 1 |
| A02005 | A06002 | 2 |
| A02006 | JA31018 | 1 |
| A02006 | A06003 | 2 |
| A02007 | JA31019 | 1 |
| A02007 | A06004 | 2 |
| A02008 | JA31042 | 1 |
| A02008 | A06005 | 2 |
| A02009 | A14012 | 1 |
| A02010 | A14013 | 1 |
| A02011 | A14003 | 1 |
| A02012 | A14002 | 1 |
| A02013 | A13012 | 1 |
| A02014 | A13013 | 1 |
| A02015 | A13003 | 1 |
| A02016 | A13002 | 1 |
| A03001 | JA31002 | 1 |
| A03001 | A07002 | 2 |
| A03002 | JA31025 | 1 |
| A03002 | A07003 | 2 |
| A03003 | JB31007 | 1 |
| A03003 | A07004 | 2 |
| A03004 | JB31030 | 1 |
| A03004 | A07005 | 2 |
| A03005 | JA31043 | 1 |
| A03005 | A07010 | 2 |
| A03006 | JA31021 | 1 |
| A03006 | A07009 | 2 |
| A03007 | JA31011 | 1 |
| A03007 | A07007 | 2 |
| A03008 | JA31034 | 1 |

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|--------|---------|---|
| A03008 | A07006 | 2 |
| A03009 | A12012 | 1 |
| A03010 | A12013 | 1 |
| A03011 | A12003 | 1 |
| A03012 | A12002 | 1 |
| A03013 | A11012 | 1 |
| A03014 | A11013 | 1 |
| A03015 | A11003 | 1 |
| A03016 | A11002 | 1 |
| A04001 | JB31028 | 1 |
| A04001 | A08002 | 2 |
| A04002 | JB31005 | 1 |
| A04002 | A08003 | 2 |
| A04003 | JA31010 | 1 |
| A04003 | A08004 | 2 |
| A04004 | JA31033 | 1 |
| A04004 | A08005 | 2 |
| A04005 | JB31046 | 1 |
| A04005 | A08010 | 2 |
| A04006 | JB31023 | 1 |
| A04006 | A08009 | 2 |
| A04007 | JB31010 | 1 |
| A04007 | A08007 | 2 |
| A04008 | JB31039 | 1 |
| A04008 | A08006 | 2 |
| A04009 | A10012 | 1 |
| A04010 | A10013 | 1 |
| A04011 | A10003 | 1 |
| A04012 | A10002 | 1 |
| A04013 | A05012 | 1 |
| A04014 | A05013 | 1 |
| A04015 | A05003 | 1 |
| A04016 | A05002 | 1 |
| A05002 | A04016 | 1 |
| A05003 | A04015 | 1 |
| A05005 | A19009 | 1 |
| A05006 | A05007 | 1 |
| A05007 | A05009 | 2 |
| A05007 | A05006 | 1 |
| A05008 | JA31020 | 1 |
| A05009 | A10006 | 1 |
| A05009 | A05007 | 2 |
| A05010 | A16012 | 1 |
| A05012 | A04013 | 1 |
| A05013 | A04014 | 1 |
| A05014 | A10014 | 1 |
| A05015 | A05016 | 1 |
| A05016 | A05015 | 1 |
| A06002 | A02005 | 2 |
| A06003 | A02006 | 2 |
| A06004 | A02007 | 2 |
| A06005 | A02008 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 2 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A06006 | A01004 | | 2 | A10009 | A10007 | | 1 |
| A06007 | A01003 | | 2 | A10010 | A19011 | | 1 |
| A06007 | A09010 | | 1 | A10012 | A04009 | | 1 |
| A06009 | A01002 | | 2 | A10013 | A04010 | | 1 |
| A06010 | A01001 | | 2 | A10014 | A05014 | | 1 |
| A07002 | A03001 | | 2 | A10014 | A15014 | | 2 |
| A07002 | A09002 | | 1 | A10015 | A10016 | | 1 |
| A07003 | A03002 | | 2 | A10016 | A10015 | | 1 |
| A07004 | A03003 | | 2 | A11002 | A03016 | | 1 |
| A07004 | A09003 | | 1 | A11003 | A03015 | | 1 |
| A07005 | A03004 | | 2 | A11005 | A19012 | | 1 |
| A07006 | A03008 | | 2 | A11006 | A11007 | | 2 |
| A07007 | A03007 | | 2 | A11006 | A12009 | | 1 |
| A07007 | A09004 | | 1 | A11007 | A11009 | | 1 |
| A07009 | A03006 | | 2 | A11007 | A11006 | | 2 |
| A07009 | A09005 | | 1 | A11009 | C01002 | | 2 |
| A07010 | A03005 | | 2 | A11009 | A11007 | | 1 |
| A07011 | A02001 | | 2 | A11010 | A19013 | | 1 |
| A07011 | A09006 | | 1 | A11012 | A03013 | | 1 |
| A07012 | A02002 | | 2 | A11013 | A03014 | | 1 |
| A07013 | A02003 | | 2 | A11014 | A12014 | | 2 |
| A07013 | A09007 | | 1 | A11014 | B15012 | | 1 |
| A07014 | A02004 | | 2 | A11015 | A11016 | | 1 |
| A08002 | A04001 | | 2 | A11016 | A11015 | | 1 |
| A08002 | JA31007 | | 1 | A12002 | A03012 | | 1 |
| A08003 | A04002 | | 2 | A12003 | A03011 | | 1 |
| A08003 | JA31045 | | 1 | A12005 | C20006 | | 1 |
| A08004 | A04003 | | 2 | A12006 | A12007 | | 1 |
| A08004 | JA31023 | | 1 | A12006 | A13009 | | 2 |
| A08005 | A04004 | | 2 | A12007 | A12009 | | 2 |
| A08005 | JA31046 | | 1 | A12007 | A12006 | | 1 |
| A08006 | A04008 | | 2 | A12009 | A11006 | | 1 |
| A08007 | A04007 | | 2 | A12009 | A12007 | | 2 |
| A08007 | A09001 | | 1 | A12010 | D19003 | | 1 |
| A08009 | A04006 | | 2 | A12012 | A03009 | | 1 |
| A08010 | A04005 | | 2 | A12013 | A03010 | | 1 |
| A09001 | A08007 | | 1 | A12014 | A13014 | | 1 |
| A09002 | A07002 | | 1 | A12014 | A11014 | | 2 |
| A09003 | A07004 | | 1 | A12015 | A12016 | | 1 |
| A09004 | A07007 | | 1 | A12016 | A12015 | | 1 |
| A09005 | A07009 | | 1 | A13002 | A02016 | | 1 |
| A09006 | A07011 | | 1 | A13003 | A02015 | | 1 |
| A09007 | A07013 | | 1 | A13005 | D19010 | | 1 |
| A09010 | A06007 | | 1 | A13006 | A13007 | | 2 |
| A10002 | A04012 | | 1 | A13006 | A14009 | | 1 |
| A10003 | A04011 | | 1 | A13007 | A13009 | | 1 |
| A10005 | A19010 | | 1 | A13007 | A13006 | | 2 |
| A10006 | A10007 | | 2 | A13009 | A12006 | | 2 |
| A10006 | A05009 | | 1 | A13009 | A13007 | | 1 |
| A10007 | A10009 | | 1 | A13010 | F19002 | | 1 |
| A10007 | A10006 | | 2 | A13012 | A02013 | | 1 |
| A10009 | A15006 | | 2 | A13013 | A02014 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 3 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A13014 | | A14014 | 2 | A17004 | | A19003 | 2 |
| A13014 | | A12014 | 1 | A17005 | | A19002 | 2 |
| A13015 | | A13016 | 1 | A17006 | | A20009 | 1 |
| A13016 | | A13015 | 1 | A17006 | | C15007 | 2 |
| A14002 | | A02012 | 1 | A17007 | | A18015 | 1 |
| A14003 | | A02011 | 1 | A17007 | | A17010 | 2 |
| A14005 | | C25014 | 1 | A17009 | | B22004 | 2 |
| A14006 | | A14009 | 2 | A17009 | | A18009 | 1 |
| A14006 | | A15009 | 1 | A17010 | | A17007 | 2 |
| A14007 | | A25003 | 2 | A17015 | | B24010 | 1 |
| A14007 | | C05013 | 1 | A18001 | | A18007 | 1 |
| A14009 | | A13006 | 1 | A18001 | | A18010 | 2 |
| A14009 | | A14006 | 2 | A18002 | | A17002 | 2 |
| A14010 | | B25009 | 2 | A18003 | | A19008 | 2 |
| A14012 | | A02009 | 1 | A18004 | | A19007 | 2 |
| A14013 | | A02010 | 1 | A18005 | | A19006 | 2 |
| A14014 | | A15014 | 1 | A18006 | | A19005 | 2 |
| A14014 | | A13014 | 2 | A18007 | | A24003 | 2 |
| A14015 | | A14016 | 1 | A18007 | | A18001 | 1 |
| A14016 | | A14015 | 1 | A18009 | | A17009 | 1 |
| A15002 | | A01016 | 1 | A18010 | | A18001 | 2 |
| A15003 | | A01015 | 1 | A18010 | | A17001 | 1 |
| A15005 | | A19015 | 1 | A18015 | | A17007 | 1 |
| A15006 | | A15007 | 1 | A19001 | | A16012 | 2 |
| A15006 | | A10009 | 2 | A19001 | | B24006 | 1 |
| A15007 | | A15009 | 2 | A19002 | | A20010 | 1 |
| A15007 | | A15006 | 1 | A19002 | | A17005 | 2 |
| A15009 | | A14006 | 1 | A19003 | | A20011 | 1 |
| A15009 | | A15007 | 2 | A19003 | | A17004 | 2 |
| A15010 | | A19014 | 1 | A19004 | | A20012 | 1 |
| A15012 | | A01013 | 1 | A19004 | | A17003 | 2 |
| A15013 | | A01014 | 1 | A19005 | | A20013 | 1 |
| A15014 | | A10014 | 2 | A19005 | | A18006 | 2 |
| A15014 | | A14014 | 1 | A19006 | | A20014 | 1 |
| A15015 | | A15016 | 1 | A19006 | | A18005 | 2 |
| A15016 | | A15015 | 1 | A19007 | | A20015 | 1 |
| A16004 | | A23010 | 2 | A19007 | | A18004 | 2 |
| A16005 | | A21007 | 1 | A19008 | | A20016 | 1 |
| A16006 | | A21009 | 2 | A19008 | | A18003 | 2 |
| A16007 | | B18005 | 1 | A19009 | | A05005 | 1 |
| A16011 | | B24011 | 1 | A19009 | | C01005 | 2 |
| A16012 | | A05010 | 1 | A19010 | | A10005 | 1 |
| A16012 | | A19001 | 2 | A19010 | | B26005 | 2 |
| A16013 | | A17002 | 1 | A19011 | | A10010 | 1 |
| A16014 | | B24007 | 1 | A19011 | | C05014 | 2 |
| A16015 | | A16016 | 1 | A19012 | | A11005 | 1 |
| A16016 | | A16015 | 1 | A19012 | | F25012 | 2 |
| A17001 | | A18010 | 1 | A19013 | | A11010 | 1 |
| A17001 | | A22011 | 2 | A19013 | | B18011 | 2 |
| A17002 | | A16013 | 1 | A19014 | | A15010 | 1 |
| A17002 | | A18002 | 2 | A19014 | | F25014 | 2 |
| A17003 | | A19004 | 2 | A19015 | | A15005 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP | | | | | | 4 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A19015 | D22002 | | 2 | A22009 | JC31013 | | 2 |
| A20001 | A20002 | | 1 | A22010 | E16013 | | 2 |
| A20002 | A20001 | | 1 | A22011 | A17001 | | 2 |
| A20002 | A20003 | | 2 | A22012 | F14012 | | 1 |
| A20003 | A20002 | | 2 | A22014 | A23013 | | 1 |
| A20003 | A20004 | | 1 | A22015 | A23004 | | 2 |
| A20004 | A20003 | | 1 | A23001 | A23002 | | 1 |
| A20004 | A20005 | | 2 | A23002 | A23001 | | 1 |
| A20005 | A20004 | | 2 | A23002 | A24015 | | 2 |
| A20005 | A20006 | | 1 | A23003 | A23004 | | 1 |
| A20006 | A20005 | | 1 | A23004 | A23003 | | 1 |
| A20006 | A20007 | | 2 | A23004 | A22015 | | 2 |
| A20007 | A20006 | | 2 | A23005 | A23006 | | 1 |
| A20007 | A20008 | | 1 | A23006 | A23005 | | 1 |
| A20008 | A20007 | | 1 | A23006 | A24007 | | 2 |
| A20009 | A17006 | | 1 | A23007 | C20003 | | 1 |
| A20010 | A19002 | | 1 | A23009 | A23010 | | 1 |
| A20011 | A19003 | | 1 | A23010 | A23009 | | 1 |
| A20012 | A19004 | | 1 | A23010 | A16004 | | 2 |
| A20013 | A19005 | | 1 | A23011 | B21007 | | 1 |
| A20014 | A19006 | | 1 | A23011 | A24006 | | 2 |
| A20015 | A19007 | | 1 | A23012 | A23014 | | 1 |
| A20016 | A19008 | | 1 | A23013 | A22014 | | 1 |
| A21001 | A21002 | | 1 | A23014 | A23012 | | 1 |
| A21002 | A21001 | | 1 | A23014 | A23016 | | 2 |
| A21002 | B25015 | | 2 | A23015 | A24014 | | 2 |
| A21003 | A21004 | | 1 | A23016 | A23014 | | 2 |
| A21004 | A21003 | | 1 | A24001 | A24008 | | 2 |
| A21004 | B25007 | | 2 | A24002 | A24011 | | 2 |
| A21005 | A21014 | | 2 | A24002 | A24003 | | 1 |
| A21006 | A22006 | | 1 | A24003 | A24002 | | 1 |
| A21007 | A16005 | | 1 | A24003 | A18007 | | 2 |
| A21009 | A21010 | | 1 | A24004 | B20006 | | 1 |
| A21009 | A16006 | | 2 | A24005 | D03009 | | 1 |
| A21010 | A21009 | | 1 | A24006 | A23011 | | 2 |
| A21011 | A21012 | | 1 | A24007 | A23006 | | 2 |
| A21011 | A22007 | | 2 | A24008 | A24009 | | 1 |
| A21012 | A21011 | | 1 | A24008 | A24001 | | 2 |
| A21013 | B25006 | | 1 | A24009 | A24008 | | 1 |
| A21014 | A21005 | | 2 | A24010 | A22003 | | 2 |
| A21014 | A21016 | | 1 | A24010 | A24011 | | 1 |
| A21015 | B25014 | | 1 | A24011 | A24010 | | 1 |
| A21016 | A21014 | | 1 | A24011 | A24002 | | 2 |
| A22001 | A22008 | | 1 | A24012 | D14004 | | 1 |
| A22002 | E25002 | | 1 | A24013 | D20005 | | 1 |
| A22002 | B15006 | | 2 | A24014 | B21003 | | 1 |
| A22003 | A27004 | | 1 | A24014 | A23015 | | 2 |
| A22003 | A24010 | | 2 | A24015 | A23002 | | 2 |
| A22004 | B24003 | | 1 | A25002 | C30002 | | 2 |
| A22006 | A21006 | | 1 | A25003 | D18005 | | 1 |
| A22007 | A21011 | | 2 | A25003 | A14007 | | 2 |
| A22008 | A22001 | | 1 | A25004 | D28002 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
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| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 5 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A25005 | C26012 | | 2 | A28004 | A2800A | | 1 |
| A25006 | A25010 | | 1 | A28005 | B20012 | | 1 |
| A25007 | C29004 | | 1 | A28006 | B14012 | | 1 |
| A25009 | C29012 | | 1 | A28007 | JE31041 | | 1 |
| A25010 | F15004 | | 2 | A28008 | A28004 | | 1 |
| A25010 | A25006 | | 1 | A2800A | A28010 | | 2 |
| A25011 | C28002 | | 1 | A28009 | JE31036 | | 1 |
| A25011 | E28013 | | 2 | A28010 | A28008 | | 2 |
| A25012 | E14014 | | 1 | A28011 | B11004 | | 1 |
| A25013 | F21009 | | 2 | A28012 | B12011 | | 1 |
| A25014 | F30005 | | 1 | A28013 | A27013 | | 1 |
| A25015 | A25016 | | 1 | A28013 | A29013 | | 2 |
| A25016 | A25015 | | 1 | A28015 | B30004 | | 1 |
| A26001 | B30001 | | 1 | A29001 | A26007 | | 1 |
| A26002 | C25013 | | 1 | A29003 | A28003 | | 2 |
| A26002 | A26003 | | 2 | A29003 | A30003 | | 1 |
| A26003 | A26002 | | 2 | A29004 | B13005 | | 1 |
| A26003 | JF31013 | | 1 | A29005 | B11012 | | 1 |
| A26004 | A30015 | | 1 | A29006 | A2900A | | 1 |
| A26004 | B29006 | | 2 | A29007 | JE31010 | | 1 |
| A26005 | A30001 | | 1 | A29008 | A29006 | | 1 |
| A26005 | B29005 | | 2 | A2900A | A29010 | | 2 |
| A26006 | A29015 | | 1 | A29009 | JE31007 | | 1 |
| A26006 | B29004 | | 2 | A29010 | A2900A | | 2 |
| A26007 | A29001 | | 1 | A29011 | B12004 | | 1 |
| A26007 | B29003 | | 2 | A29012 | B13011 | | 2 |
| A26009 | B30009 | | 2 | A29013 | A28013 | | 2 |
| A26010 | B18012 | | 1 | A29013 | A30013 | | 1 |
| A26010 | B30010 | | 2 | A29015 | A26006 | | 1 |
| A26012 | B30002 | | 1 | A30001 | A26005 | | 1 |
| A26013 | B29012 | | 1 | A30003 | A29003 | | 1 |
| A26014 | B29011 | | 1 | A30004 | B14005 | | 2 |
| A26015 | B29010 | | 1 | A30005 | B12012 | | 1 |
| A27001 | B30007 | | 1 | A30006 | A3000A | | 1 |
| A27003 | E29013 | | 2 | A30007 | JE31003 | | 1 |
| A27003 | A28003 | | 1 | A3000A | A30006 | | 1 |
| A27004 | B25003 | | 2 | A3000A | A30010 | | 2 |
| A27004 | A22003 | | 1 | A30009 | JE31026 | | 1 |
| A27005 | A2700A | | 1 | A30010 | A3000A | | 2 |
| A27006 | B13012 | | 1 | A30011 | B13004 | | 1 |
| A27007 | B27012 | | 1 | A30012 | B14011 | | 1 |
| A27008 | A27005 | | 1 | A30013 | A29013 | | 1 |
| A27009 | JE31043 | | 1 | A30015 | A26004 | | 1 |
| A27010 | B14004 | | 1 | R01002 | B01003 | | 2 |
| A27011 | B20004 | | 1 | R01002 | JF31022 | | 1 |
| A27012 | C14007 | | 1 | R01003 | B14015 | | 1 |
| A27013 | E29014 | | 2 | R01003 | B01002 | | 2 |
| A27013 | A28013 | | 1 | R01004 | B01005 | | 1 |
| A27015 | B30006 | | 1 | R01004 | B02011 | | 2 |
| A28001 | B30005 | | 1 | R01005 | B01011 | | 2 |
| A28003 | A27003 | | 1 | R01005 | B01004 | | 1 |
| A28003 | A29003 | | 2 | R01006 | B01007 | | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 6 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B01006 | JF31020 | | 1 | B03012 | B04012 | | 2 |
| B01007 | B14001 | | 1 | B03013 | JB31040 | | 1 |
| B01007 | B01006 | | 2 | B03014 | JB31017 | | 1 |
| B01009 | JB31013 | | 1 | B03015 | B03016 | | 1 |
| B01010 | JB31036 | | 1 | B03016 | B03015 | | 1 |
| B01011 | B06011 | | 1 | B04002 | B04003 | | 2 |
| B01011 | B01005 | | 2 | B04002 | JF31017 | | 1 |
| B01012 | B06012 | | 1 | B04003 | B11015 | | 1 |
| B01012 | B02012 | | 2 | B04003 | B04002 | | 2 |
| B01013 | JB31035 | | 1 | B04004 | B04005 | | 2 |
| B01014 | JB31012 | | 1 | B04004 | B05011 | | 1 |
| B01015 | B01016 | | 1 | B04005 | B04011 | | 1 |
| B01016 | B01015 | | 1 | B04005 | B04004 | | 2 |
| B02002 | B02003 | | 2 | B04006 | B04007 | | 2 |
| B02002 | JF31023 | | 1 | B04006 | JF31015 | | 1 |
| B02003 | B13015 | | 1 | B04007 | B11001 | | 1 |
| B02003 | B02002 | | 2 | B04007 | B04006 | | 2 |
| B02004 | B02005 | | 2 | B04009 | JB31020 | | 1 |
| B02004 | B03011 | | 1 | B04010 | JB31043 | | 1 |
| B02005 | B02011 | | 1 | B04011 | B03004 | | 2 |
| B02005 | B02004 | | 2 | B04011 | B04005 | | 1 |
| B02006 | B02007 | | 2 | B04012 | B03012 | | 2 |
| B02006 | JF31019 | | 1 | B04012 | B05012 | | 1 |
| B02007 | B13001 | | 1 | B04013 | JB31042 | | 1 |
| B02007 | B02006 | | 2 | B04014 | JB31019 | | 1 |
| B02009 | JB31015 | | 1 | B04015 | B04016 | | 1 |
| B02010 | JB31038 | | 1 | B04016 | B04015 | | 1 |
| B02011 | B01004 | | 2 | B05002 | B05003 | | 2 |
| B02011 | B02005 | | 1 | B05002 | JF31014 | | 1 |
| B02012 | B01012 | | 2 | B05003 | B20015 | | 1 |
| B02012 | B03012 | | 1 | B05003 | B05002 | | 2 |
| B02013 | JB31037 | | 1 | B05004 | B05005 | | 1 |
| B02014 | JB31014 | | 1 | B05005 | B05011 | | 2 |
| B02015 | B02016 | | 1 | B05005 | B05004 | | 1 |
| B02016 | B02015 | | 1 | B05006 | B05007 | | 2 |
| B03002 | B03003 | | 2 | B05006 | JF31005 | | 1 |
| B03002 | JF31012 | | 1 | B05007 | B20001 | | 1 |
| B03003 | B12015 | | 1 | B05007 | B05006 | | 2 |
| B03003 | B03002 | | 2 | B05009 | JB31022 | | 1 |
| B03004 | B03005 | | 1 | B05010 | JB31045 | | 1 |
| B03004 | B04011 | | 2 | B05011 | B04004 | | 1 |
| B03005 | B03011 | | 2 | B05011 | B05005 | | 2 |
| B03005 | B03004 | | 1 | B05012 | B04012 | | 1 |
| B03006 | B03007 | | 2 | B05012 | JC31043 | | 2 |
| B03006 | JF31011 | | 1 | B05013 | JB31044 | | 1 |
| B03007 | B12001 | | 1 | B05014 | JB31021 | | 1 |
| B03007 | B03006 | | 2 | B05015 | B05016 | | 1 |
| B03009 | JB31018 | | 1 | B05016 | B05015 | | 1 |
| B03010 | JB31041 | | 1 | B06002 | C02005 | | 1 |
| B03011 | B02004 | | 1 | B06002 | B06003 | | 2 |
| B03011 | B03005 | | 2 | B06003 | B06002 | | 2 |
| B03012 | B02012 | | 1 | B06003 | F02002 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 7 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B06004 | | B07011 | 2 | B08010 | | JB31026 | 1 |
| B06004 | | B06005 | 1 | B08011 | | B08005 | 2 |
| B06005 | | B06004 | 1 | B08011 | | B07004 | 1 |
| B06005 | | B06011 | 2 | B08012 | | B09012 | 2 |
| B06006 | | B06007 | 2 | B08012 | | B07012 | 1 |
| B06006 | | JF31002 | 1 | B08013 | | JB31025 | 1 |
| B06007 | | B18004 | 1 | B08014 | | JB31002 | 1 |
| B06007 | | B06006 | 2 | B08015 | | B08016 | 1 |
| B06009 | | JA31003 | 1 | B08016 | | B08015 | 1 |
| B06010 | | JA31026 | 1 | B09002 | | JC31041 | 1 |
| B06011 | | B06005 | 2 | B09002 | | B09003 | 2 |
| B06011 | | B01011 | 1 | B09003 | | B09002 | 2 |
| B06012 | | B07012 | 2 | B09003 | | B13007 | 1 |
| B06012 | | B01012 | 1 | B09004 | | B10011 | 1 |
| B06013 | | JA31024 | 1 | B09004 | | B09005 | 2 |
| B06014 | | JA31001 | 1 | B09005 | | B09004 | 2 |
| B06015 | | B06016 | 1 | B09005 | | B09011 | 1 |
| B06016 | | B06015 | 1 | B09006 | | B09007 | 2 |
| B07002 | | E14010 | 1 | B09006 | | F03012 | 1 |
| B07002 | | B07003 | 2 | B09007 | | C20004 | 1 |
| B07003 | | B07002 | 2 | B09007 | | B09006 | 2 |
| B07004 | | B08011 | 1 | B09009 | | JA31004 | 1 |
| B07004 | | B07005 | 2 | B09010 | | JA31027 | 1 |
| B07005 | | B07004 | 2 | B09011 | | B09005 | 1 |
| B07005 | | B07011 | 1 | B09011 | | B08004 | 2 |
| B07006 | | JC31022 | 1 | B09012 | | B10012 | 1 |
| B07006 | | B07007 | 2 | B09012 | | B08012 | 2 |
| B07007 | | B07006 | 2 | B09013 | | JB31027 | 1 |
| B07007 | | F12011 | 1 | B09014 | | JB31004 | 1 |
| B07009 | | JB31001 | 1 | B09015 | | B09016 | 1 |
| B07010 | | JB31024 | 1 | B09016 | | B09015 | 1 |
| B07011 | | B07005 | 1 | B10004 | | B10005 | 1 |
| B07011 | | B06004 | 2 | B10004 | | B10011 | 2 |
| B07012 | | B08012 | 1 | B10005 | | B15004 | 2 |
| B07012 | | B06012 | 2 | B10005 | | B10004 | 1 |
| B07013 | | JB31034 | 1 | B10006 | | B10007 | 1 |
| B07014 | | JB31011 | 1 | B10007 | | C15010 | 2 |
| B07015 | | B07016 | 1 | B10007 | | B10006 | 1 |
| B07016 | | B07015 | 1 | B10009 | | JB31009 | 1 |
| B08002 | | JC31023 | 1 | B10010 | | JB31032 | 1 |
| B08002 | | B08003 | 2 | B10011 | | B10004 | 2 |
| B08003 | | B08002 | 2 | B10011 | | B09004 | 1 |
| B08003 | | B14007 | 1 | B10012 | | B15012 | 2 |
| B08004 | | B09011 | 2 | B10012 | | B09012 | 1 |
| B08004 | | B08005 | 1 | B10013 | | JA31029 | 1 |
| B08005 | | B08004 | 1 | B10014 | | JA31006 | 1 |
| B08005 | | B08011 | 2 | B10015 | | B10016 | 1 |
| B08006 | | JC31040 | 1 | B10016 | | B10015 | 1 |
| B08006 | | B08007 | 2 | B11001 | | B04007 | 1 |
| B08007 | | B08006 | 2 | B11002 | | F03004 | 1 |
| B08007 | | B13009 | 1 | B11003 | | B12003 | 2 |
| B08009 | | JB31003 | 1 | B11004 | | D09004 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 8 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B11004 | A28011 | 1 | | B13011 | D07011 | 1 | |
| B11005 | B11007 | 1 | | B13011 | A29012 | 2 | |
| B11006 | C14009 | 1 | | B13012 | D07012 | 2 | |
| B11007 | B11005 | 1 | | B13012 | A27006 | 1 | |
| B11007 | B11008 | 2 | | B13013 | B14013 | 2 | |
| B11008 | B11007 | 2 | | B13013 | B12013 | 1 | |
| B11008 | B11009 | 1 | | B13014 | F04006 | 1 | |
| B11009 | B11008 | 1 | | B13015 | B02003 | 1 | |
| B11009 | B11011 | 2 | | B14001 | B01007 | 1 | |
| B11010 | D03004 | 1 | | B14002 | F04004 | 1 | |
| B11010 | B21014 | 2 | | B14003 | B19003 | 1 | |
| B11011 | B11009 | 2 | | B14003 | B13003 | 2 | |
| B11012 | D09012 | 2 | | B14004 | D06004 | 2 | |
| B11012 | A29005 | 1 | | B14004 | A27010 | 1 | |
| B11013 | B12013 | 2 | | B14005 | D06005 | 1 | |
| B11013 | C06004 | 1 | | B14005 | A30004 | 2 | |
| B11014 | F03002 | 1 | | B14006 | C18010 | 2 | |
| B11015 | B04003 | 1 | | B14006 | B25010 | 1 | |
| B12001 | B03007 | 1 | | B14007 | B08003 | 1 | |
| B12002 | F04014 | 1 | | B14009 | F12009 | 1 | |
| B12003 | B13003 | 1 | | B14010 | C15002 | 2 | |
| B12003 | B11003 | 2 | | B14010 | JF31025 | 1 | |
| B12004 | D08004 | 2 | | B14011 | D06011 | 2 | |
| B12004 | A29011 | 1 | | B14011 | A30012 | 1 | |
| B12005 | B12007 | 1 | | B14012 | D06012 | 2 | |
| B12006 | B27007 | 1 | | B14012 | A28006 | 1 | |
| B12007 | B12005 | 1 | | B14013 | B19013 | 1 | |
| B12007 | B12008 | 2 | | B14013 | B13013 | 2 | |
| B12008 | B12007 | 2 | | B14014 | F04002 | 1 | |
| B12008 | B12009 | 1 | | B14015 | B01003 | 1 | |
| B12009 | B12008 | 1 | | B15002 | C10010 | 1 | |
| B12010 | B16014 | 1 | | B15002 | B15003 | 2 | |
| B12011 | D08011 | 2 | | B15003 | B15002 | 2 | |
| B12011 | A28012 | 1 | | B15003 | JF31029 | 1 | |
| B12012 | D08012 | 2 | | B15004 | B15005 | 1 | |
| B12012 | A30005 | 1 | | B15004 | B10005 | 2 | |
| B12013 | B13013 | 1 | | B15005 | B15011 | 2 | |
| B12013 | B11013 | 2 | | B15005 | B15004 | 1 | |
| B12014 | F04012 | 1 | | B15006 | A22002 | 2 | |
| B12015 | B03003 | 1 | | B15006 | B15007 | 1 | |
| B13001 | B02007 | 1 | | B15007 | B15006 | 1 | |
| B13002 | F04010 | 1 | | B15007 | JF31010 | 2 | |
| B13003 | B14003 | 2 | | B15009 | JA31036 | 1 | |
| B13003 | B12003 | 1 | | B15010 | JA31014 | 1 | |
| B13004 | D07004 | 2 | | B15011 | C15014 | 1 | |
| B13004 | A30011 | 1 | | B15011 | B15005 | 2 | |
| B13005 | D07005 | 2 | | B15012 | A11014 | 1 | |
| B13005 | A29004 | 1 | | B15012 | B10012 | 2 | |
| B13006 | F24012 | 1 | | B15013 | JA31035 | 1 | |
| B13007 | B09003 | 1 | | B15014 | JA31012 | 1 | |
| B13009 | B08007 | 1 | | B15015 | B15016 | 1 | |
| B13010 | F23004 | 1 | | B15016 | B15015 | 1 | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 9 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B16002 | | C02010 | 1 | B19003 | | B14003 | 1 |
| B16002 | | C14003 | 2 | B19013 | | B20013 | 2 |
| B16003 | | E16003 | 1 | B19013 | | B14013 | 1 |
| B16003 | | F28003 | 2 | B20001 | | B05007 | 1 |
| B16004 | | C03002 | 2 | B20002 | | F03010 | 1 |
| B16005 | | C16002 | 1 | B20003 | | F30012 | 1 |
| B16006 | | F17010 | 1 | B20003 | | B19003 | 2 |
| B16007 | | E20010 | 1 | B20004 | | D10004 | 2 |
| B16009 | | E30004 | 1 | B20004 | | A27011 | 1 |
| B16010 | | E26014 | 1 | B20005 | | B20007 | 1 |
| B16011 | | E26013 | 1 | B20006 | | A24004 | 1 |
| B16012 | | E20014 | 2 | B20007 | | B20005 | 1 |
| B16013 | | B17010 | 1 | B20007 | | B20008 | 2 |
| B16014 | | E20002 | 2 | B20008 | | B20007 | 2 |
| B16014 | | B12010 | 1 | B20008 | | B20009 | 1 |
| B16015 | | B16016 | 1 | B20009 | | B20008 | 1 |
| B16016 | | B16015 | 1 | B20009 | | B20011 | 2 |
| B17002 | | C13013 | 2 | B20010 | | C14012 | 1 |
| B17002 | | C20010 | 1 | B20011 | | B20009 | 2 |
| B17003 | | C19014 | 2 | B20012 | | D10012 | 2 |
| B17003 | | F20012 | 1 | B20012 | | A28005 | 1 |
| B17005 | | C12004 | 1 | B20013 | | F30007 | 1 |
| B17006 | | C12007 | 1 | B20013 | | B19013 | 2 |
| B17007 | | B18002 | 1 | B20014 | | F03006 | 1 |
| B17009 | | B18006 | 1 | B20015 | | B05003 | 1 |
| B17010 | | B16013 | 1 | B21002 | | JC31020 | 1 |
| B17011 | | D25013 | 1 | B21002 | | C05003 | 2 |
| B17013 | | C14014 | 1 | B21003 | | A24014 | 1 |
| B17013 | | JD31020 | 2 | B21004 | | JC31012 | 1 |
| B17014 | | C18011 | 1 | B21005 | | C18012 | 2 |
| B17014 | | JD31021 | 2 | B21005 | | C15002 | 1 |
| B17015 | | B17016 | 1 | B21006 | | JD31022 | 1 |
| B17016 | | B17015 | 1 | B21007 | | A23011 | 1 |
| B18002 | | B17007 | 1 | B21009 | | D04013 | 1 |
| B18002 | | D25002 | 2 | B21010 | | JD31044 | 1 |
| B18003 | | E16002 | 2 | B21011 | | JD31043 | 1 |
| B18004 | | B06007 | 1 | B21012 | | D13012 | 1 |
| B18005 | | A16007 | 1 | B21013 | | C11001 | 2 |
| B18005 | | C20002 | 2 | B21014 | | B11010 | 2 |
| B18006 | | B17009 | 1 | B21015 | | B21016 | 1 |
| B18006 | | C20003 | 2 | B21016 | | B21015 | 1 |
| B18007 | | F30013 | 1 | B22002 | | D15005 | 2 |
| B18009 | | C07004 | 1 | B22003 | | B23009 | 1 |
| B18010 | | C20007 | 1 | B22004 | | B23007 | 1 |
| B18011 | | A19013 | 2 | B22004 | | A17009 | 2 |
| B18011 | | F01003 | 1 | B22005 | | B24009 | 1 |
| B18012 | | A26010 | 1 | B22006 | | B23003 | 1 |
| B18013 | | JF31009 | 2 | B22010 | | C27004 | 1 |
| B18014 | | B26012 | 1 | B22011 | | C23011 | 1 |
| B18015 | | B18016 | 1 | B22011 | | B23014 | 2 |
| B18016 | | B18015 | 1 | B22012 | | F10012 | 1 |
| B19003 | | B20003 | 2 | B22013 | | C22003 | 2 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 10 | REV. D |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| R22013 | D25004 | | 1 | R25010 | E28002 | | 2 |
| R22014 | C04004 | | 1 | R25011 | B23002 | | 2 |
| R22014 | C28014 | | 2 | R25011 | B25003 | | 1 |
| B22015 | B22016 | | 1 | R25012 | C30012 | | 1 |
| R22016 | B22015 | | 1 | R25014 | A21015 | | 1 |
| R23002 | B28007 | | 1 | R25015 | A21002 | | 2 |
| R23002 | B25011 | | 2 | B26002 | JC31024 | | 1 |
| R23003 | B22006 | | 1 | B26002 | C25006 | | 2 |
| B23003 | D15006 | | 2 | B26003 | C25011 | | 1 |
| R23004 | B24011 | | 2 | B26003 | F13002 | | 2 |
| R23004 | JF3101A | | 1 | B26004 | C27003 | | 1 |
| R23005 | C01011 | | 2 | R26005 | A19010 | | 2 |
| R23005 | B24005 | | 1 | R26005 | JF31007 | | 1 |
| B23007 | B22004 | | 1 | B26006 | C06011 | | 1 |
| R23008 | B23013 | | 1 | B26006 | F15010 | | 2 |
| R23009 | B22003 | | 1 | R26007 | C27014 | | 1 |
| R23011 | B24012 | | 1 | R26009 | B27011 | | 1 |
| R23012 | B24006 | | 2 | R26010 | B29014 | | 1 |
| B23013 | B23008 | | 1 | B26011 | C28010 | | 1 |
| R23014 | B22011 | | 2 | B26012 | B18014 | | 1 |
| B23014 | B28009 | | 1 | R26013 | D29012 | | 1 |
| R23015 | B23016 | | 1 | R26014 | F20003 | | 1 |
| R23016 | B23015 | | 1 | R26015 | B26016 | | 1 |
| R24002 | F09013 | | 2 | R26016 | B26015 | | 1 |
| R24003 | A22004 | | 1 | B27002 | B27010 | | 1 |
| B24004 | C30005 | | 1 | R27002 | E29006 | | 2 |
| R24005 | B23005 | | 1 | R27003 | C27010 | | 1 |
| R24006 | A19001 | | 1 | R27004 | F10010 | | 1 |
| R24006 | B23012 | | 2 | R27005 | C27009 | | 1 |
| R24007 | A16014 | | 1 | R27006 | C27007 | | 1 |
| B24009 | B22005 | | 1 | R27007 | B12006 | | 1 |
| R24010 | A17015 | | 1 | R27009 | D18006 | | 1 |
| B24010 | B24013 | | 2 | R27010 | C30013 | | 2 |
| R24011 | A16011 | | 1 | R27010 | B27002 | | 1 |
| R24011 | B23004 | | 2 | R27011 | B26009 | | 1 |
| R24012 | B23011 | | 1 | B27012 | A27007 | | 1 |
| R24013 | B24010 | | 2 | R27013 | E28009 | | 1 |
| R24014 | C01005 | | 1 | B27014 | D17011 | | 1 |
| R24014 | F01002 | | 2 | B27015 | B27016 | | 1 |
| B24015 | B24016 | | 1 | R27016 | B27015 | | 1 |
| R24016 | B24015 | | 1 | R28001 | B28008 | | 1 |
| B25001 | B25008 | | 1 | R28002 | B29007 | | 1 |
| R25002 | D20009 | | 1 | B28003 | B30007 | | 2 |
| B25003 | B25011 | | 1 | B28004 | B30006 | | 2 |
| R25003 | A27004 | | 2 | R28005 | B30005 | | 2 |
| B25004 | E17002 | | 1 | B28006 | B30004 | | 2 |
| R25006 | A21013 | | 1 | R28007 | B28009 | | 2 |
| R25007 | A21004 | | 2 | R28007 | B23002 | | 1 |
| R25008 | B25001 | | 1 | B28008 | B28001 | | 1 |
| B25009 | A14010 | | 2 | R28009 | B23014 | | 1 |
| R25009 | F24002 | | 1 | R28009 | B28007 | | 2 |
| R25010 | B14006 | | 1 | R28010 | B30015 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 11 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B28010 | | D07009 | 2 | | | | |
| B28011 | | B30014 | 1 | | C01006 | C01003 | 1 |
| B28011 | | D07007 | 2 | | C01007 | C01011 | 1 |
| B28012 | | B30013 | 1 | | C01009 | C01014 | 1 |
| B28012 | | D08009 | 2 | | C01010 | D05004 | 1 |
| B28013 | | B30012 | 1 | | C01011 | C01007 | 1 |
| B28013 | | C10013 | 2 | | C01011 | B23005 | 2 |
| B28015 | | B29009 | 1 | | C01012 | C09004 | 1 |
| B29001 | | B29008 | 1 | | C01013 | D19002 | 2 |
| B29003 | | A26007 | 2 | | C01013 | C04003 | 1 |
| B29004 | | A26006 | 2 | | C01014 | C01009 | 1 |
| B29005 | | A26005 | 2 | | C01014 | C02003 | 2 |
| B29006 | | A26004 | 2 | | C01015 | C01016 | 1 |
| B29007 | | B28002 | 1 | | C01016 | C01015 | 1 |
| B29008 | | B29001 | 1 | | C02002 | C09010 | 1 |
| B29009 | | B28015 | 1 | | C02003 | C01014 | 2 |
| B29010 | | A26015 | 1 | | C02003 | C04002 | 1 |
| B29011 | | A26014 | 1 | | C02004 | D16011 | 1 |
| B29012 | | A26013 | 1 | | C02004 | C10002 | 2 |
| B29012 | | D06009 | 2 | | C02005 | JF31003 | 2 |
| B29013 | | B30003 | 1 | | C02005 | B06002 | 1 |
| B29013 | | D06007 | 2 | | C02006 | JC31003 | 1 |
| B29014 | | B26010 | 1 | | C02006 | C20013 | 2 |
| B30001 | | F27001 | 2 | | C02007 | C08005 | 1 |
| B30001 | | A26001 | 1 | | C02009 | F15002 | 1 |
| B30002 | | A26012 | 1 | | C02010 | D13014 | 2 |
| B30002 | | B30003 | 2 | | C02010 | B16002 | 1 |
| B30003 | | B30002 | 2 | | C02011 | C08007 | 1 |
| B30003 | | B29013 | 1 | | C02012 | C14006 | 1 |
| B30004 | | A28015 | 1 | | C02013 | JE31023 | 1 |
| B30004 | | B28006 | 2 | | C02013 | C03010 | 2 |
| B30005 | | A28001 | 1 | | C02014 | JD31015 | 1 |
| B30005 | | B28005 | 2 | | C02015 | C02016 | 1 |
| B30006 | | A27015 | 1 | | C02016 | C02015 | 1 |
| B30006 | | B28004 | 2 | | C03002 | E20007 | 1 |
| B30007 | | A27001 | 1 | | C03002 | B16004 | 2 |
| B30007 | | B28003 | 2 | | C03003 | C19003 | 1 |
| B30009 | | F15007 | 1 | | C03004 | C19002 | 1 |
| B30009 | | A26009 | 2 | | C03005 | F14003 | 1 |
| B30010 | | A26010 | 2 | | C03005 | C04010 | 2 |
| B30010 | | C28004 | 1 | | C03006 | JC31002 | 1 |
| B30012 | | B28013 | 1 | | C03007 | C04014 | 1 |
| B30013 | | B28012 | 1 | | C03009 | E07002 | 1 |
| B30014 | | B28011 | 1 | | C03010 | C02013 | 2 |
| B30015 | | B28010 | 1 | | C03011 | E16011 | 1 |
| C01002 | | C15015 | 1 | | C03012 | C06002 | 1 |
| C01002 | | A11009 | 2 | | C03013 | C08004 | 1 |
| C01003 | | D05001 | 2 | | C03013 | C19005 | 2 |
| C01003 | | C01006 | 1 | | C03014 | F15006 | 1 |
| C01004 | | D18004 | 1 | | C03014 | C24014 | 2 |
| C01005 | | A19009 | 2 | | C03015 | C03016 | 1 |
| C01005 | | B24014 | 1 | | C03016 | C03015 | 1 |
| | | | | | C04002 | C02003 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 12 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C04002 | | C13014 | 2 | C07003 | | F09005 | 2 |
| C04003 | | C01013 | 1 | C07004 | | B18009 | 1 |
| C04004 | | B22014 | 1 | C07004 | | C07012 | 2 |
| C04005 | | C06013 | 1 | C07005 | | C07011 | 2 |
| C04006 | | C09013 | 2 | C07005 | | C07002 | 1 |
| C04007 | | C06006 | 1 | C07006 | | F24014 | 1 |
| C04009 | | E12014 | 1 | C07007 | | F23003 | 1 |
| C04010 | | C03005 | 2 | C07010 | | F09011 | 1 |
| C04011 | | C09006 | 1 | C07011 | | C15013 | 1 |
| C04011 | | D12010 | 2 | C07011 | | C07005 | 2 |
| C04012 | | E12004 | 1 | C07012 | | C07004 | 2 |
| C04013 | | C09003 | 2 | C07012 | | F14004 | 1 |
| C04013 | | C19014 | 1 | C07013 | | F24011 | 2 |
| C04014 | | C03007 | 1 | C07013 | | D12011 | 1 |
| C04014 | | F05005 | 2 | C07014 | | F26011 | 2 |
| C04015 | | C04016 | 1 | C07014 | | E11011 | 1 |
| C04016 | | C04015 | 1 | C07015 | | C07016 | 1 |
| C05002 | | JC31021 | 1 | C07016 | | C07015 | 1 |
| C05003 | | B21002 | 2 | C08002 | | C06012 | 2 |
| C05004 | | F19012 | 1 | C08002 | | D20003 | 1 |
| C05005 | | D13002 | 1 | C08003 | | C08008 | 1 |
| C05006 | | E02001 | 1 | C08004 | | C10006 | 2 |
| C05007 | | E03004 | 1 | C08004 | | C03013 | 1 |
| C05008 | | C31046 | 2 | C08005 | | C02007 | 1 |
| C05009 | | D25005 | 1 | C08006 | | C13010 | 2 |
| C05010 | | D14006 | 2 | C08006 | | C13011 | 1 |
| C05010 | | F26011 | 1 | C08007 | | C02011 | 1 |
| C05011 | | C24003 | 2 | C08008 | | C08003 | 1 |
| C05012 | | C18004 | 1 | C08010 | | C09012 | 1 |
| C05013 | | A14007 | 1 | C08011 | | D03012 | 1 |
| C05014 | | A19011 | 2 | C08012 | | C06009 | 1 |
| C05015 | | C05016 | 1 | C08013 | | C14004 | 1 |
| C05016 | | C05015 | 1 | C08014 | | F15009 | 1 |
| C06002 | | C03012 | 1 | C08015 | | C08016 | 1 |
| C06002 | | C17003 | 2 | C08016 | | C08015 | 1 |
| C06003 | | C16014 | 1 | C09002 | | F05007 | 1 |
| C06004 | | B11013 | 1 | C09003 | | C09007 | 1 |
| C06005 | | C11003 | 1 | C09003 | | C04013 | 2 |
| C06006 | | C04007 | 1 | C09004 | | C01012 | 1 |
| C06007 | | F05013 | 1 | C09004 | | D14012 | 2 |
| C06009 | | C08012 | 1 | C09005 | | C22011 | 1 |
| C06010 | | C13007 | 1 | C09005 | | E26003 | 2 |
| C06011 | | B26006 | 1 | C09006 | | C04011 | 1 |
| C06012 | | JD31045 | 1 | C09007 | | C09003 | 1 |
| C06012 | | C08002 | 2 | C09009 | | C12005 | 1 |
| C06013 | | C04005 | 1 | C09010 | | C02002 | 1 |
| C06014 | | D25006 | 1 | C09011 | | C16007 | 1 |
| C06015 | | C06016 | 1 | C09012 | | C08010 | 1 |
| C06016 | | C06015 | 1 | C09012 | | E19003 | 2 |
| C07002 | | C07005 | 1 | C09013 | | D17007 | 1 |
| C07002 | | C09014 | 2 | C09013 | | C04006 | 2 |
| C07003 | | JD31033 | 1 | C09014 | | C07002 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 13 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C09014 | | C10011 | 1 | C12010 | | E20004 | 2 |
| C09015 | | C09016 | 1 | C12011 | | D18012 | 2 |
| C09016 | | C09015 | 1 | C12011 | | E15006 | 1 |
| C10002 | | C02004 | 2 | C12015 | | C12016 | 1 |
| C10003 | | C11012 | 2 | C12016 | | C12015 | 1 |
| C10004 | | D16009 | 1 | C13002 | | C18014 | 1 |
| C10005 | | C10011 | 2 | C13002 | | F05014 | 2 |
| C10006 | | C08004 | 2 | C13003 | | C14005 | 2 |
| C10007 | | C13006 | 1 | C13003 | | D18010 | 1 |
| C10009 | | F02004 | 1 | C13005 | | E16014 | 2 |
| C10010 | | B15002 | 1 | C13006 | | C10007 | 1 |
| C10011 | | C09014 | 1 | C13006 | | E13013 | 2 |
| C10011 | | C10005 | 2 | C13007 | | C06010 | 1 |
| C10012 | | C23012 | 1 | C13009 | | D16010 | 1 |
| C10012 | | E26002 | 2 | C13010 | | C08006 | 2 |
| C10013 | | B28013 | 2 | C13011 | | C08006 | 1 |
| C10013 | | D08007 | 1 | C13011 | | C14002 | 2 |
| C10014 | | C19009 | 1 | C13013 | | C13014 | 1 |
| C10015 | | C10016 | 1 | C13013 | | B17002 | 2 |
| C10016 | | C10015 | 1 | C13014 | | C04002 | 2 |
| C11001 | | C11004 | 1 | C13014 | | C13013 | 1 |
| C11001 | | B21013 | 2 | C13015 | | C13016 | 1 |
| C11002 | | C11006 | 2 | C13016 | | C13015 | 1 |
| C11003 | | C06005 | 1 | C14002 | | C13011 | 2 |
| C11004 | | E06014 | 2 | C14003 | | B16002 | 2 |
| C11004 | | C11001 | 1 | C14003 | | E13014 | 1 |
| C11005 | | F19007 | 1 | C14004 | | C08013 | 1 |
| C11005 | | C18014 | 2 | C14005 | | JC31009 | 1 |
| C11006 | | C11008 | 1 | C14005 | | C13003 | 2 |
| C11006 | | C11002 | 2 | C14006 | | C02012 | 1 |
| C11007 | | C11016 | 1 | C14007 | | A27012 | 1 |
| C11008 | | C11006 | 1 | C14009 | | B11006 | 1 |
| C11008 | | C11013 | 2 | C14010 | | C18009 | 1 |
| C11010 | | F21001 | 1 | C14010 | | C14014 | 2 |
| C11011 | | C11012 | 1 | C14011 | | JD31014 | 1 |
| C11012 | | C11011 | 1 | C14012 | | B20010 | 1 |
| C11012 | | C10003 | 2 | C14013 | | JD31011 | 1 |
| C11013 | | C11008 | 2 | C14014 | | C14010 | 2 |
| C11014 | | C11015 | 1 | C14014 | | B17013 | 1 |
| C11015 | | C11014 | 1 | C14015 | | C14016 | 1 |
| C11015 | | D20011 | 2 | C14016 | | C14015 | 1 |
| C11016 | | C11007 | 1 | C15001 | | E14011 | 2 |
| C12002 | | C12006 | 2 | C15002 | | B21005 | 1 |
| C12003 | | C19005 | 1 | C15002 | | B14010 | 2 |
| C12003 | | C21003 | 2 | C15006 | | F21011 | 1 |
| C12004 | | B17005 | 1 | C15007 | | A17006 | 2 |
| C12005 | | C09009 | 1 | C15010 | | C22005 | 1 |
| C12006 | | E14006 | 1 | C15010 | | B10007 | 2 |
| C12006 | | C12002 | 2 | C15011 | | E11005 | 2 |
| C12007 | | B17006 | 1 | C15012 | | C30003 | 1 |
| C12009 | | E01006 | 1 | C15013 | | C07011 | 1 |
| C12010 | | JC31019 | 1 | C15013 | | C21005 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 14 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C15014 | B15011 | | 1 | C19002 | C03004 | | 1 |
| C15015 | C01002 | | 1 | C19003 | F20010 | | 2 |
| C15015 | C20005 | | 2 | C19003 | C03003 | | 1 |
| C16002 | F30009 | | 2 | C19004 | D15011 | | 1 |
| C16002 | B16005 | | 1 | C19005 | C03013 | | 2 |
| C16003 | D13010 | | 2 | C19005 | C12003 | | 1 |
| C16003 | C16004 | | 1 | C19006 | C26009 | | 1 |
| C16004 | C16003 | | 1 | C19007 | D23014 | | 1 |
| C16005 | D16007 | | 1 | C19009 | C10014 | | 1 |
| C16006 | C19012 | | 1 | C19010 | C24002 | | 2 |
| C16007 | C09011 | | 1 | C19011 | C16014 | | 2 |
| C16009 | C23004 | | 1 | C19011 | C23005 | | 1 |
| C16010 | F13007 | | 1 | C19012 | C16006 | | 1 |
| C16011 | E29010 | | 2 | C19013 | D24009 | | 1 |
| C16014 | C06003 | | 1 | C19014 | C04013 | | 1 |
| C16014 | C19011 | | 2 | C19014 | B17003 | | 2 |
| C16015 | C16016 | | 1 | C19015 | C19016 | | 1 |
| C16016 | C16015 | | 1 | C19016 | C19015 | | 1 |
| C17002 | C21007 | | 1 | C20002 | B18005 | | 2 |
| C17002 | E12011 | | 2 | C20003 | B18006 | | 2 |
| C17003 | C06002 | | 2 | C20003 | A23007 | | 1 |
| C17004 | D17010 | | 1 | C20004 | H09007 | | 1 |
| C17005 | C21009 | | 1 | C20005 | C15015 | | 2 |
| C17006 | C17011 | | 2 | C20005 | F01015 | | 1 |
| C17007 | C18010 | | 1 | C20006 | A12005 | | 1 |
| C17009 | C30013 | | 1 | C20007 | B18010 | | 1 |
| C17010 | C22007 | | 1 | C20009 | C20014 | | 1 |
| C17011 | E15012 | | 1 | C20010 | B17002 | | 1 |
| C17011 | C17006 | | 2 | C20010 | D28005 | | 2 |
| C17012 | E03005 | | 1 | C20011 | D14010 | | 1 |
| C17013 | F24007 | | 1 | C20012 | F20011 | | 1 |
| C17014 | E20009 | | 1 | C20013 | C02006 | | 2 |
| C17015 | C17016 | | 1 | C20013 | D17006 | | 1 |
| C17016 | C17015 | | 1 | C20014 | C20009 | | 1 |
| C18002 | E30009 | | 1 | C20015 | C20016 | | 1 |
| C18003 | JE31034 | | 1 | C20016 | C20015 | | 1 |
| C18004 | C05012 | | 1 | C21002 | C22014 | | 2 |
| C18004 | D19004 | | 2 | C21003 | C12003 | | 2 |
| C18005 | JE31024 | | 1 | C21003 | D14013 | | 1 |
| C18006 | E30013 | | 1 | C21004 | C21012 | | 2 |
| C18007 | JE31029 | | 1 | C21004 | C22004 | | 1 |
| C18009 | C14010 | | 1 | C21005 | C15013 | | 2 |
| C18010 | C17007 | | 1 | C21005 | C21011 | | 1 |
| C18010 | B14006 | | 2 | C21006 | C21013 | | 1 |
| C18011 | B17014 | | 1 | C21007 | C17002 | | 1 |
| C18012 | B21005 | | 2 | C21009 | C17005 | | 1 |
| C18012 | D15004 | | 1 | C21010 | C22003 | | 1 |
| C18013 | JE31001 | | 1 | C21011 | C21005 | | 1 |
| C18014 | C11005 | | 2 | C21011 | C23011 | | 2 |
| C18014 | C13002 | | 1 | C21012 | D24007 | | 1 |
| C18015 | C18016 | | 1 | C21012 | C21004 | | 2 |
| C18016 | C18015 | | 1 | C21013 | C21006 | | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 15 | REV. D |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C21013 | C26004 | 2 | | C24006 | E16005 | 1 | |
| C21014 | D23012 | 1 | | C24007 | E05011 | 1 | |
| C21014 | C22002 | 2 | | C24009 | C25010 | 1 | |
| C21015 | C21016 | 1 | | C24010 | E15013 | 2 | |
| C21016 | C21015 | 1 | | C24011 | C22006 | 2 | |
| C22002 | C21014 | 2 | | C24014 | C03014 | 2 | |
| C22003 | C21010 | 1 | | C24015 | C24016 | 1 | |
| C22003 | B22013 | 2 | | C24016 | C24015 | 1 | |
| C22004 | C21004 | 1 | | C25002 | JD31028 | 1 | |
| C22005 | C15010 | 1 | | C25003 | E13010 | 1 | |
| C22005 | C22011 | 2 | | C25004 | D24004 | 1 | |
| C22006 | C22013 | 1 | | C25005 | D24005 | 1 | |
| C22006 | C24011 | 2 | | C25006 | B26002 | 2 | |
| C22007 | C17010 | 1 | | C25006 | E12003 | 1 | |
| C22010 | C24002 | 1 | | C25007 | C26003 | 1 | |
| C22011 | C22005 | 2 | | C25009 | C23002 | 1 | |
| C22011 | C09005 | 1 | | C25010 | C24009 | 1 | |
| C22012 | D24012 | 1 | | C25011 | B26003 | 1 | |
| C22013 | C22006 | 1 | | C25012 | JC31037 | 1 | |
| C22013 | D24011 | 2 | | C25013 | A26002 | 1 | |
| C22014 | D23009 | 1 | | C25014 | A14005 | 1 | |
| C22014 | C21002 | 2 | | C25015 | C25016 | 1 | |
| C22015 | C22016 | 1 | | C25016 | C25015 | 1 | |
| C22016 | C22015 | 1 | | C26002 | F13009 | 1 | |
| C23002 | C25009 | 1 | | C26003 | C25007 | 1 | |
| C23002 | C23014 | 2 | | C26003 | F13003 | 2 | |
| C23003 | C23013 | 2 | | C26004 | C21013 | 2 | |
| C23003 | E26007 | 1 | | C26005 | C27011 | 1 | |
| C23004 | C16009 | 1 | | C26005 | C26014 | 2 | |
| C23004 | D29012 | 2 | | C26007 | D15003 | 1 | |
| C23005 | C19011 | 1 | | C26008 | C26013 | 1 | |
| C23005 | F18011 | 2 | | C26009 | C19006 | 1 | |
| C23006 | F19004 | 1 | | C26010 | E11002 | 1 | |
| C23007 | F15005 | 1 | | C26011 | D23002 | 2 | |
| C23009 | F20005 | 1 | | C26012 | F08007 | 1 | |
| C23011 | C21011 | 2 | | C26012 | A25005 | 2 | |
| C23011 | B22011 | 1 | | C26013 | C26008 | 1 | |
| C23012 | C28004 | 2 | | C26014 | C26005 | 2 | |
| C23012 | C10012 | 1 | | C26014 | D29002 | 1 | |
| C23013 | D29010 | 1 | | C26015 | C26016 | 1 | |
| C23013 | C23003 | 2 | | C26016 | C26015 | 1 | |
| C23014 | C23002 | 2 | | C27002 | D21013 | 1 | |
| C23014 | D29014 | 1 | | C27003 | B26004 | 1 | |
| C23015 | C23016 | 1 | | C27004 | B22010 | 1 | |
| C23016 | C23015 | 1 | | C27005 | C28013 | 1 | |
| C24002 | C22010 | 1 | | C27005 | C27011 | 2 | |
| C24002 | C19010 | 2 | | C27007 | B27006 | 1 | |
| C24003 | D18009 | 1 | | C27009 | B27005 | 1 | |
| C24003 | C05011 | 2 | | C27010 | B27003 | 1 | |
| C24004 | E16007 | 1 | | C27011 | C27005 | 2 | |
| C24004 | D15010 | 2 | | C27011 | C26005 | 1 | |
| C24005 | F23007 | 1 | | C27012 | E15009 | 1 | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 16 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C27013 | F13004 | | 1 | C30013 | C17009 | | 1 |
| C27014 | B26007 | | 1 | C30013 | B27010 | | 2 |
| C27015 | C27016 | | 1 | C30014 | C29005 | | 2 |
| C27016 | C27015 | | 1 | C30015 | C30016 | | 1 |
| C28002 | E15010 | | 2 | C30016 | C30015 | | 1 |
| C28002 | A25011 | | 1 | C31026 | C31027 | | 1 |
| C28003 | F25003 | | 1 | C31027 | C31026 | | 1 |
| C28004 | B30010 | | 1 | C31027 | C31028 | | 2 |
| C28004 | C23012 | | 2 | C31028 | C31027 | | 2 |
| C28005 | C30011 | | 2 | C31028 | C31030 | | 1 |
| C28005 | C28012 | | 1 | C31030 | C31028 | | 1 |
| C28007 | C28011 | | 1 | C31030 | C31038 | | 2 |
| C28010 | B26011 | | 1 | C31038 | C31030 | | 2 |
| C28011 | C28007 | | 1 | C31038 | C31046 | | 1 |
| C28012 | C28005 | | 1 | C31046 | C31038 | | 1 |
| C28012 | C28013 | | 2 | C31046 | C05008 | | 2 |
| C28013 | C28012 | | 2 | D01002 | D06015 | | 1 |
| C28013 | C27005 | | 1 | D01003 | JE31025 | | 1 |
| C28014 | B22014 | | 2 | D01004 | D06001 | | 1 |
| C28014 | E24009 | | 1 | D01005 | JE31002 | | 1 |
| C28015 | C28016 | | 1 | D01006 | D07015 | | 1 |
| C28016 | C28015 | | 1 | D01007 | JE31006 | | 1 |
| C29002 | C30009 | | 1 | D01009 | JE31009 | | 1 |
| C29003 | C29013 | | 2 | D01010 | D07001 | | 1 |
| C29004 | A25007 | | 1 | D01011 | JE31013 | | 1 |
| C29005 | D28007 | | 1 | D01012 | D08015 | | 1 |
| C29005 | C30014 | | 2 | D01013 | JE31040 | | 1 |
| C29006 | D27003 | | 1 | D01014 | D08001 | | 1 |
| C29007 | D27013 | | 1 | D01015 | D01016 | | 1 |
| C29009 | D27014 | | 1 | D01016 | D01015 | | 1 |
| C29010 | D27006 | | 1 | D02002 | D09015 | | 1 |
| C29011 | D28009 | | 1 | D02003 | JE31042 | | 1 |
| C29011 | F05010 | | 2 | D02004 | D09001 | | 1 |
| C29012 | A25009 | | 1 | D02005 | JE31022 | | 1 |
| C29013 | D18013 | | 1 | D02006 | D10015 | | 1 |
| C29013 | C29003 | | 2 | D02007 | JD31025 | | 1 |
| C29014 | F10009 | | 1 | D02008 | D02012 | | 2 |
| C29015 | C29016 | | 1 | D02008 | D31030 | | 1 |
| C29016 | C29015 | | 1 | D02009 | JD31003 | | 1 |
| C30002 | F29014 | | 1 | D02010 | D10001 | | 1 |
| C30002 | A25002 | | 2 | D02011 | JD31004 | | 1 |
| C30003 | C15012 | | 1 | D02012 | D02008 | | 2 |
| C30003 | C30004 | | 2 | D02015 | D02016 | | 1 |
| C30004 | C30003 | | 2 | D02016 | D02015 | | 1 |
| C30004 | C30011 | | 1 | D03001 | D03008 | | 1 |
| C30005 | B24004 | | 1 | D03002 | D03003 | | 2 |
| C30006 | D26002 | | 1 | D03002 | F21002 | | 1 |
| C30007 | D19014 | | 1 | D03003 | D03010 | | 1 |
| C30009 | C29002 | | 1 | D03003 | D03002 | | 2 |
| C30011 | C30004 | | 1 | D03004 | B11010 | | 1 |
| C30011 | C28005 | | 2 | D03005 | F08012 | | 1 |
| C30012 | B25012 | | 1 | D03006 | D04015 | | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 17 | REV. D |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D03007 | | D04002 | 2 | D06003 | | D12004 | 2 |
| D03008 | | D03001 | 1 | D06003 | | D07003 | 1 |
| D03009 | | A24005 | 1 | D06004 | | E08013 | 1 |
| D03010 | | D05003 | 2 | D06004 | | B14004 | 2 |
| D03010 | | D03003 | 1 | D06005 | | E07010 | 2 |
| D03011 | | D14002 | 1 | D06005 | | B14005 | 1 |
| D03012 | | C08011 | 1 | D06006 | | D21010 | 2 |
| D03013 | | D12013 | 1 | D06007 | | B29013 | 2 |
| D03013 | | D13013 | 2 | D06009 | | B29012 | 2 |
| D03014 | | D04013 | 2 | D06010 | | E23014 | 1 |
| D03015 | | D04004 | 2 | D06011 | | F16013 | 1 |
| D04001 | | D04002 | 1 | D06011 | | B14011 | 2 |
| D04002 | | D04001 | 1 | D06012 | | E08012 | 1 |
| D04002 | | D03007 | 2 | D06012 | | B14012 | 2 |
| D04003 | | D04004 | 1 | D06013 | | D12007 | 2 |
| D04004 | | D04003 | 1 | D06013 | | D07013 | 1 |
| D04004 | | D03015 | 2 | D06015 | | D01002 | 1 |
| D04005 | | D04006 | 1 | D07001 | | D01010 | 1 |
| D04005 | | D05007 | 2 | D07003 | | D06003 | 1 |
| D04006 | | D04005 | 1 | D07003 | | D08003 | 2 |
| D04007 | | D04008 | 1 | D07004 | | E08015 | 1 |
| D04008 | | D04007 | 1 | D07004 | | B13004 | 2 |
| D04008 | | D05015 | 2 | D07005 | | E06009 | 1 |
| D04009 | | D05014 | 1 | D07005 | | B13005 | 2 |
| D04010 | | D04012 | 1 | D07006 | | E23011 | 1 |
| D04011 | | D05006 | 1 | D07007 | | B28011 | 2 |
| D04012 | | D04010 | 1 | D07007 | | F20002 | 1 |
| D04012 | | D04014 | 2 | D07009 | | B28010 | 2 |
| D04013 | | B21009 | 1 | D07010 | | D21006 | 2 |
| D04013 | | D03014 | 2 | D07011 | | E07003 | 2 |
| D04014 | | D04012 | 2 | D07011 | | B13011 | 1 |
| D04014 | | D04016 | 1 | D07012 | | E08014 | 1 |
| D04015 | | D03006 | 1 | D07012 | | B13012 | 2 |
| D04016 | | D04014 | 1 | D07013 | | D06013 | 1 |
| D05001 | | F25009 | 1 | D07013 | | D08013 | 2 |
| D05001 | | C01003 | 2 | D07015 | | D01006 | 1 |
| D05002 | | E21012 | 1 | D08001 | | D01014 | 1 |
| D05003 | | D05011 | 1 | D08003 | | D07003 | 2 |
| D05003 | | D03010 | 2 | D08003 | | D09003 | 1 |
| D05004 | | C01010 | 1 | D08004 | | E09013 | 1 |
| D05006 | | D04011 | 1 | D08004 | | B12004 | 2 |
| D05007 | | D04005 | 2 | D08005 | | D08008 | 1 |
| D05008 | | D05009 | 1 | D08006 | | F20004 | 2 |
| D05009 | | D05008 | 1 | D08007 | | C10013 | 1 |
| D05010 | | E11013 | 2 | D08007 | | E30002 | 2 |
| D05010 | | D25014 | 1 | D08008 | | D08005 | 1 |
| D05011 | | D14005 | 2 | D08009 | | B28012 | 2 |
| D05011 | | D05003 | 1 | D08009 | | F10006 | 1 |
| D05012 | | E11012 | 1 | D08010 | | D21004 | 2 |
| D05014 | | D04009 | 1 | D08011 | | F16009 | 1 |
| D05015 | | D04008 | 2 | D08011 | | B12011 | 2 |
| D06001 | | D01004 | 1 | D08012 | | E09012 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 18 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D08012 | B12012 | | 2 | D11013 | D11008 | | 1 |
| D08013 | D07013 | | 2 | D11015 | E10007 | | 1 |
| D08013 | D09013 | | 1 | D12002 | JD31017 | | 1 |
| D08015 | D01012 | | 1 | D12003 | D12005 | | 2 |
| D09001 | D02004 | | 1 | D12004 | D06003 | | 2 |
| D09003 | D08003 | | 1 | D12005 | D16004 | | 1 |
| D09003 | D10003 | | 2 | D12005 | D12003 | | 2 |
| D09004 | E09015 | | 1 | D12006 | JD31037 | | 1 |
| D09004 | B11004 | | 2 | D12007 | D06013 | | 2 |
| D09005 | F29010 | | 1 | D12009 | F05003 | | 1 |
| D09006 | E22011 | | 1 | D12010 | C04011 | | 2 |
| D09007 | F27014 | | 1 | D12011 | C07013 | | 1 |
| D09009 | F27015 | | 1 | D12012 | E05014 | | 1 |
| D09010 | D25010 | | 2 | D12013 | D03013 | | 1 |
| D09011 | F29007 | | 2 | D12013 | D20004 | | 2 |
| D09012 | E09014 | | 1 | D12014 | F21004 | | 1 |
| D09012 | B11012 | | 2 | D12015 | D12016 | | 1 |
| D09013 | D08013 | | 1 | D12016 | D12015 | | 1 |
| D09013 | D10013 | | 2 | D13002 | E16006 | | 2 |
| D09015 | D02002 | | 1 | D13002 | C05005 | | 1 |
| D10001 | D02010 | | 1 | D13003 | D20004 | | 1 |
| D10003 | D09003 | | 2 | D13003 | E19011 | | 2 |
| D10004 | E10013 | | 1 | D13004 | D13005 | | 1 |
| D10004 | B20004 | | 2 | D13005 | D13004 | | 1 |
| D10005 | F29013 | | 1 | D13006 | F30003 | | 1 |
| D10006 | D25012 | | 2 | D13007 | E10011 | | 1 |
| D10007 | D10008 | | 1 | D13009 | D14014 | | 1 |
| D10008 | D10007 | | 1 | D13010 | D19009 | | 1 |
| D10008 | D10009 | | 2 | D13010 | C16003 | | 2 |
| D10009 | D10008 | | 2 | D13011 | D20006 | | 1 |
| D10010 | D25011 | | 2 | D13011 | F29014 | | 2 |
| D10011 | F29003 | | 1 | D13012 | B21012 | | 1 |
| D10012 | E10012 | | 1 | D13013 | D03013 | | 2 |
| D10012 | B20012 | | 2 | D13014 | D14007 | | 1 |
| D10013 | D09013 | | 2 | D13014 | C02010 | | 2 |
| D10015 | D02006 | | 1 | D13015 | D13016 | | 1 |
| D11001 | E10009 | | 1 | D13016 | D13015 | | 1 |
| D11003 | F28005 | | 2 | D14002 | D14003 | | 2 |
| D11004 | E05002 | | 2 | D14002 | D03011 | | 1 |
| D11005 | D11006 | | 1 | D14003 | D18003 | | 1 |
| D11006 | D11007 | | 2 | D14003 | D14002 | | 2 |
| D11006 | D11005 | | 1 | D14004 | A24012 | | 1 |
| D11007 | D11009 | | 1 | D14005 | D14011 | | 1 |
| D11007 | D11006 | | 2 | D14005 | D05011 | | 2 |
| D11008 | D11013 | | 1 | D14006 | C05010 | | 2 |
| D11009 | D11010 | | 2 | D14007 | D13014 | | 1 |
| D11009 | D11007 | | 1 | D14010 | C20011 | | 1 |
| D11010 | D11011 | | 1 | D14011 | D29011 | | 2 |
| D11010 | D11009 | | 2 | D14011 | D14005 | | 1 |
| D11011 | E25005 | | 2 | D14012 | C09004 | | 2 |
| D11011 | D11010 | | 1 | D14012 | F08005 | | 1 |
| D11012 | E05003 | | 2 | D14013 | C21003 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------|---------|-------------|---------|--------------------------------------|--------------|-------------|---------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 19 | E |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL |
| D14013 | E15014 | | 2 | D18004 | C01004 | | 1 |
| D14014 | D13009 | | 1 | D18005 | A25003 | | 1 |
| D14014 | D20002 | | 2 | D18006 | B27009 | | 1 |
| D14015 | D14016 | | 1 | D18007 | D18014 | | 1 |
| D14016 | D14015 | | 1 | D18009 | C24003 | | 1 |
| D15002 | D17009 | | 1 | D18010 | C13003 | | 1 |
| D15003 | C26007 | | 1 | D18011 | E15003 | | 2 |
| D15004 | C18012 | | 1 | D18012 | JC31014 | | 1 |
| D15005 | D17013 | | 1 | D18012 | C12011 | | 2 |
| D15005 | B22002 | | 2 | D18013 | C29013 | | 1 |
| D15006 | B23003 | | 2 | D18014 | D18007 | | 1 |
| D15007 | D19013 | | 1 | D18015 | D18016 | | 1 |
| D15009 | E07014 | | 2 | D18016 | D18015 | | 1 |
| D15009 | D15012 | | 1 | D19002 | D27009 | | 1 |
| D15010 | C24004 | | 2 | D19002 | C01013 | | 2 |
| D15011 | C19004 | | 1 | D19003 | A12010 | | 1 |
| D15011 | D16006 | | 2 | D19003 | E30010 | | 2 |
| D15012 | D15009 | | 1 | D19004 | C18004 | | 2 |
| D15013 | D15014 | | 2 | D19004 | F08013 | | 1 |
| D15014 | F16015 | | 1 | D19009 | D13010 | | 1 |
| D15014 | D15013 | | 2 | | | | |
| D15015 | D15016 | | 1 | D19010 | A13005 | | 1 |
| D15016 | D15015 | | 1 | D19010 | D19011 | | 2 |
| D16002 | F23010 | | 1 | D19011 | D19010 | | 2 |
| D16003 | F25007 | | 1 | D19011 | E30014 | | 1 |
| D16004 | D12005 | | 1 | D19012 | D19013 | | 2 |
| D16005 | D17003 | | 1 | D19012 | JE31020 | | 1 |
| D16006 | D15011 | | 2 | D19013 | D15007 | | 1 |
| D16007 | C16005 | | 1 | D19013 | D19012 | | 2 |
| D16009 | C10004 | | 1 | D19014 | C30007 | | 1 |
| D16010 | C13009 | | 1 | D19015 | D19016 | | 1 |
| D16011 | C02004 | | 1 | D19016 | D19015 | | 1 |
| D16011 | E14004 | | 2 | D20002 | D14014 | | 2 |
| D16012 | E18002 | | 1 | D20002 | E12012 | | 1 |
| D16013 | E24013 | | 1 | D20003 | C08002 | | 1 |
| D16014 | E18001 | | 2 | D20003 | D20006 | | 2 |
| D16015 | D16016 | | 1 | D20004 | D12013 | | 2 |
| D16016 | D16015 | | 1 | D20004 | D13003 | | 1 |
| D17002 | F16014 | | 1 | D20005 | A24013 | | 1 |
| D17003 | D16005 | | 1 | D20006 | D20003 | | 2 |
| D17006 | C20013 | | 1 | D20006 | D13011 | | 1 |
| D17007 | C09013 | | 1 | D20007 | E20002 | | 1 |
| D17009 | D15002 | | 1 | D20009 | B25002 | | 1 |
| D17010 | C17004 | | 1 | D20010 | E20003 | | 1 |
| D17011 | B27014 | | 1 | D20011 | C11015 | | 2 |
| D17012 | JE31045 | | 1 | D20012 | E18002 | | 2 |
| D17013 | D15005 | | 1 | D20013 | D18002 | | 1 |
| D17014 | F09012 | | 1 | D20013 | F22009 | | 2 |
| D17015 | D17016 | | 1 | D20014 | JD31023 | | 1 |
| D17016 | D17015 | | 1 | D20015 | D20016 | | 1 |
| D18002 | D20013 | | 1 | D20016 | D20015 | | 1 |
| D18003 | D14003 | | 1 | D21002 | E21013 | | 1 |
| | | | | D21002 | D24003 | | 2 |

PE54018

PE54018

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 20 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D21004 | E22014 | | 1 | D24003 | D21002 | | 2 |
| D21004 | D08010 | | 2 | D24003 | D25012 | | 1 |
| D21005 | D24002 | | 1 | D24004 | C25004 | | 1 |
| D21006 | E23012 | | 1 | D24005 | C25005 | | 1 |
| D21006 | D07010 | | 2 | D24005 | D24013 | | 2 |
| D21007 | D23002 | | 1 | D24006 | D21011 | | 1 |
| D21009 | D23006 | | 1 | D24007 | C21012 | | 1 |
| D21010 | E23013 | | 1 | D24009 | C19013 | | 1 |
| D21010 | D06006 | | 2 | D24010 | D25007 | | 1 |
| D21011 | D24006 | | 1 | D24011 | C22013 | | 2 |
| D21012 | E24011 | | 1 | D24012 | C22012 | | 1 |
| D21013 | C27002 | | 1 | D24013 | D24005 | | 2 |
| D21014 | E19004 | | 2 | D24014 | D21014 | | 1 |
| D21014 | D24014 | | 1 | D24015 | D24016 | | 1 |
| D21015 | D21016 | | 1 | D24016 | D24015 | | 1 |
| D21016 | D21015 | | 1 | D25002 | B18002 | | 2 |
| D22002 | A19015 | | 2 | D25002 | F30006 | | 1 |
| D22002 | D22003 | | 1 | D25003 | E13012 | | 1 |
| D22003 | D22002 | | 1 | D25004 | B22013 | | 1 |
| D22003 | F01004 | | 2 | D25005 | C05009 | | 1 |
| D22004 | D22005 | | 1 | D25005 | D25006 | | 2 |
| D22005 | D22004 | | 1 | D25006 | D25005 | | 2 |
| D22006 | F25005 | | 1 | D25006 | C06014 | | 1 |
| D22007 | D22014 | | 1 | D25007 | D24010 | | 1 |
| D22009 | D22013 | | 1 | D25009 | D23005 | | 1 |
| D22010 | D29006 | | 1 | D25010 | E22012 | | 1 |
| D22011 | JC31036 | | 1 | D25010 | D09010 | | 2 |
| D22011 | F25004 | | 2 | D25011 | E21014 | | 1 |
| D22012 | E25002 | | 2 | D25011 | D10010 | | 2 |
| D22013 | D22009 | | 1 | D25012 | D24003 | | 1 |
| D22014 | D22007 | | 1 | D25012 | D10006 | | 2 |
| D22015 | D22016 | | 1 | D25013 | B17011 | | 1 |
| D22016 | D22015 | | 1 | D25014 | D05010 | | 1 |
| D23002 | D21007 | | 1 | D25015 | D25016 | | 1 |
| D23002 | C26011 | | 2 | D25016 | D25015 | | 1 |
| D23003 | D23005 | | 2 | D26002 | C30006 | | 1 |
| D23004 | D23010 | | 1 | D26003 | JD31024 | | 1 |
| D23005 | D25009 | | 1 | D26004 | D27013 | | 2 |
| D23005 | D23003 | | 2 | D26005 | JD31006 | | 1 |
| D23006 | D21009 | | 1 | D26006 | D27014 | | 2 |
| D23007 | D23013 | | 1 | D26007 | JD31029 | | 1 |
| D23009 | C22014 | | 1 | D26009 | JE31035 | | 1 |
| D23010 | D23004 | | 1 | D26010 | F25011 | | 1 |
| D23011 | D23014 | | 2 | D26011 | JE31015 | | 1 |
| D23012 | C21014 | | 1 | D26012 | F25013 | | 1 |
| D23013 | D23007 | | 1 | D26013 | JE31019 | | 1 |
| D23013 | F13011 | | 2 | D26014 | F19003 | | 1 |
| D23014 | C19007 | | 1 | D26015 | D26016 | | 1 |
| D23014 | D23011 | | 2 | D26016 | D26015 | | 1 |
| D23015 | D23016 | | 1 | D27002 | JD31035 | | 1 |
| D23016 | D23015 | | 1 | D27002 | D28006 | | 2 |
| D24002 | D21005 | | 1 | D27003 | C29006 | | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 21 | REV. D |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D27004 | | D27011 | 1 | D29016 | | D29015 | 1 |
| D27005 | | JD31013 | 1 | D30009 | | D29004 | 1 |
| D27005 | | D28010 | 2 | D30015 | | D30016 | 1 |
| D27006 | | C29010 | 1 | D30016 | | D30015 | 1 |
| D27007 | | D27010 | 1 | D31030 | | D31038 | 2 |
| D27009 | | D19002 | 1 | D31030 | | D02008 | 1 |
| D27010 | | D27007 | 1 | D31038 | | D31046 | 1 |
| D27011 | | D27004 | 1 | D31038 | | D31030 | 2 |
| D27012 | | F29009 | 1 | D31046 | | D31038 | 1 |
| D27013 | | C29007 | 1 | E01001 | | F23009 | 1 |
| D27013 | | D26004 | 2 | E01001 | | E02001 | 2 |
| D27014 | | C29009 | 1 | E01003 | | E01004 | 1 |
| D27014 | | D26006 | 2 | E01004 | | E01007 | 2 |
| D27015 | | D27016 | 1 | E01004 | | E01003 | 1 |
| D27016 | | D27015 | 1 | E01005 | | E02003 | 1 |
| D28002 | | A25004 | 1 | E01006 | | C12009 | 1 |
| D28002 | | D28003 | 2 | E01007 | | E13004 | 1 |
| D28003 | | D28002 | 2 | E01007 | | E01004 | 2 |
| D28003 | | D28004 | 1 | E01009 | | E09007 | 2 |
| D28004 | | D28003 | 1 | E01010 | | E08003 | 2 |
| D28004 | | D28014 | 2 | E01010 | | F26013 | 1 |
| D28005 | | C20010 | 2 | E01011 | | E08004 | 2 |
| D28005 | | D28011 | 1 | E01011 | | F26014 | 1 |
| D28006 | | D27002 | 2 | F01012 | | E08009 | 2 |
| D28007 | | C29005 | 1 | E01013 | | E08007 | 2 |
| D28009 | | C29011 | 1 | E01014 | | F28010 | 1 |
| D28010 | | D27005 | 2 | E02001 | | E01001 | 2 |
| D28010 | | F19014 | 1 | E02001 | | C05006 | 1 |
| D28011 | | D28005 | 1 | E02003 | | E02007 | 2 |
| D28011 | | E11004 | 2 | E02003 | | E01005 | 1 |
| D28014 | | D28004 | 2 | E02004 | | E13011 | 2 |
| D28015 | | D28016 | 1 | E02004 | | F16003 | 1 |
| D28016 | | D28015 | 1 | E02005 | | E20011 | 1 |
| D29002 | | C26014 | 1 | E02006 | | E15004 | 1 |
| D29002 | | D29005 | 2 | F02007 | | E15003 | 1 |
| D29003 | | D29007 | 1 | E02007 | | E02003 | 2 |
| D29004 | | D30009 | 1 | E02009 | | E05002 | 1 |
| D29005 | | D29002 | 2 | E02010 | | E05003 | 1 |
| D29005 | | D29011 | 1 | F02011 | | E09003 | 2 |
| D29006 | | D29010 | 1 | F02012 | | E09004 | 2 |
| D29007 | | D29003 | 1 | F02013 | | E09009 | 2 |
| D29009 | | E29011 | 1 | E02014 | | F28011 | 1 |
| D29010 | | C23013 | 1 | F03001 | | JE31004 | 1 |
| D29011 | | D29005 | 1 | E03001 | | E08005 | 2 |
| D29011 | | D14011 | 2 | E03002 | | E08009 | 1 |
| D29012 | | C23004 | 2 | E03003 | | E08007 | 1 |
| D29012 | | B26013 | 1 | F03004 | | C05007 | 1 |
| D29013 | | D29014 | 2 | E03005 | | C17012 | 1 |
| D29013 | | F20006 | 1 | F03006 | | E08004 | 1 |
| D29014 | | C23014 | 1 | E03007 | | E08003 | 1 |
| D29014 | | D29013 | 2 | F03009 | | JE31011 | 1 |
| D29015 | | D29016 | 1 | E03009 | | E08002 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 22 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E03010 | | JE31032 | 1 | E06006 | | E06007 | 1 |
| E03010 | | E08001 | 2 | E06007 | | E06006 | 1 |
| E03011 | | E04011 | 1 | E06007 | | F16009 | 2 |
| E03012 | | E04005 | 1 | E06008 | | E06004 | 1 |
| E03013 | | E04004 | 1 | E06008 | | E06011 | 2 |
| E03014 | | E04014 | 1 | E06009 | | E07013 | 2 |
| E03014 | | F17004 | 2 | E06009 | | D07005 | 1 |
| E03015 | | JE31027 | 1 | E06011 | | E0600A | 2 |
| E03015 | | E08006 | 2 | E06011 | | E06012 | 1 |
| E04001 | | JE31017 | 1 | E06012 | | E06011 | 1 |
| E04001 | | E09005 | 2 | E06014 | | C11004 | 2 |
| E04002 | | E09009 | 1 | E06014 | | E07014 | 1 |
| E04003 | | E09007 | 1 | E06015 | | E06016 | 1 |
| E04004 | | E03013 | 1 | E06016 | | E06015 | 1 |
| E04005 | | E03012 | 1 | E07002 | | C03009 | 1 |
| E04006 | | E09004 | 1 | E07002 | | E06002 | 2 |
| E04007 | | E09003 | 1 | F07003 | | F16011 | 1 |
| E04008 | | E31046 | 1 | E07003 | | D07011 | 2 |
| E04009 | | JD31001 | 1 | E07004 | | JE31033 | 1 |
| E04009 | | E09002 | 2 | E07005 | | JE3102A | 1 |
| E04010 | | JE31021 | 1 | E07006 | | E07007 | 1 |
| E04010 | | E09001 | 2 | E07007 | | E07006 | 1 |
| E04011 | | E05011 | 2 | E07007 | | F16013 | 2 |
| E04011 | | E03011 | 1 | E07009 | | F20009 | 1 |
| E04012 | | E05005 | 1 | E07010 | | F16012 | 1 |
| E04013 | | E05004 | 1 | E07010 | | D06005 | 2 |
| E04014 | | E05014 | 2 | E07011 | | JE31005 | 1 |
| E04014 | | E03014 | 1 | E07012 | | JE31012 | 1 |
| E04015 | | JE31014 | 1 | E07013 | | E06009 | 2 |
| E04015 | | E09006 | 2 | E07013 | | F16010 | 1 |
| E05001 | | JD31010 | 1 | E07014 | | D15009 | 2 |
| E05001 | | E10005 | 2 | E07014 | | E06014 | 1 |
| E05002 | | E02009 | 1 | E07015 | | E07016 | 1 |
| E05002 | | D11004 | 2 | E07016 | | E07015 | 1 |
| E05003 | | E02010 | 1 | E08001 | | E03010 | 2 |
| E05003 | | D11012 | 2 | E08002 | | E03009 | 2 |
| E05004 | | E04013 | 1 | E08003 | | E03007 | 1 |
| E05005 | | E04012 | 1 | E08003 | | E01010 | 2 |
| E05008 | | E05009 | 1 | E08004 | | E03006 | 1 |
| E05009 | | E0500A | 1 | E08004 | | E01011 | 2 |
| E05009 | | E05010 | 2 | E08005 | | E03001 | 2 |
| E05010 | | E05009 | 2 | E08006 | | E03015 | 2 |
| E05011 | | C24007 | 1 | E08007 | | E03003 | 1 |
| E05011 | | E04011 | 2 | E08007 | | E01013 | 2 |
| E05013 | | F23006 | 1 | F08009 | | E03002 | 1 |
| E05014 | | D12012 | 1 | E08009 | | E01012 | 2 |
| E05014 | | E04014 | 2 | E08010 | | F23012 | 1 |
| E05015 | | JD31027 | 1 | E08010 | | E09010 | 2 |
| E05015 | | E10006 | 2 | F08011 | | E09011 | 1 |
| F06002 | | E07002 | 2 | E08012 | | D06012 | 1 |
| F06004 | | E0600A | 1 | F08013 | | D06004 | 1 |
| F06005 | | JE31037 | 1 | E08014 | | D07012 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 23 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E08015 | | D07004 | 1 | E11014 | | E11013 | 1 |
| E09001 | | E04010 | 2 | E11015 | | E11016 | 1 |
| E09002 | | E04009 | 2 | E11016 | | E11015 | 1 |
| E09003 | | E04007 | 1 | E12002 | | JC31025 | 1 |
| E09003 | | E02011 | 2 | E12003 | | C25006 | 1 |
| F09004 | | E04006 | 1 | E12003 | | E11003 | 2 |
| E09004 | | E02012 | 2 | E12004 | | C04012 | 1 |
| E09005 | | E04001 | 2 | E12005 | | E11007 | 1 |
| E09006 | | E04015 | 2 | E12005 | | F10003 | 2 |
| E09007 | | E04003 | 1 | E12006 | | JC31001 | 1 |
| F09007 | | E01009 | 2 | E12007 | | F05002 | 1 |
| E09009 | | E04002 | 1 | F12009 | | F27001 | 1 |
| F09009 | | E02013 | 2 | E12010 | | E12011 | 1 |
| E09010 | | E08010 | 2 | E12011 | | C17002 | 2 |
| E09010 | | E10010 | 1 | F12011 | | E12010 | 1 |
| E09011 | | E10011 | 2 | E12012 | | D20002 | 1 |
| E09011 | | E08011 | 1 | E12012 | | E24010 | 2 |
| E09012 | | D08012 | 1 | F12013 | | F10002 | 1 |
| E09013 | | D08004 | 1 | E12014 | | C04009 | 1 |
| E09014 | | D09012 | 1 | E12015 | | E12016 | 1 |
| E09015 | | D09004 | 1 | E12016 | | E12015 | 1 |
| E10001 | | E10002 | 1 | E13002 | | E15002 | 2 |
| E10002 | | E10001 | 1 | E13002 | | E13011 | 1 |
| E10002 | | E10003 | 2 | F13003 | | E15006 | 2 |
| E10003 | | E10002 | 2 | E13004 | | E01007 | 1 |
| E10003 | | E10004 | 1 | E13005 | | E30006 | 2 |
| E10004 | | E10003 | 1 | E13005 | | F26006 | 1 |
| E10004 | | E10008 | 2 | E13006 | | F17003 | 2 |
| E10005 | | E05001 | 2 | E13007 | | F16004 | 1 |
| E10006 | | E05015 | 2 | F13009 | | F17005 | 1 |
| F10007 | | D11015 | 1 | E13010 | | C25003 | 1 |
| E10008 | | E10004 | 2 | E13011 | | E13002 | 1 |
| E10009 | | D11001 | 1 | F13011 | | E02004 | 2 |
| E10010 | | E09010 | 1 | F13012 | | D25003 | 1 |
| E10011 | | D13007 | 1 | E13013 | | C13006 | 2 |
| E10011 | | E09011 | 2 | E13013 | | F13010 | 1 |
| E10012 | | D10012 | 1 | E13014 | | C14003 | 1 |
| F10013 | | D10004 | 1 | F13014 | | F23010 | 2 |
| F11002 | | C26010 | 1 | E13015 | | E13016 | 1 |
| F11003 | | E12003 | 2 | F13016 | | E13015 | 1 |
| E11004 | | D28011 | 2 | E14002 | | E23001 | 1 |
| F11004 | | F13013 | 1 | E14002 | | E14005 | 2 |
| F11005 | | C15011 | 2 | F14003 | | F05012 | 1 |
| E11005 | | E18003 | 1 | E14004 | | D16011 | 2 |
| F11007 | | E12005 | 1 | E14005 | | E14002 | 2 |
| E11009 | | E29002 | 1 | F14005 | | E25005 | 1 |
| E11011 | | C07014 | 1 | E14006 | | C12006 | 1 |
| E11011 | | F14011 | 2 | F14010 | | B07002 | 1 |
| F11012 | | D05012 | 1 | E14011 | | F28004 | 1 |
| E11013 | | E11014 | 1 | F14011 | | C15001 | 2 |
| F11013 | | D05010 | 2 | E14012 | | F21010 | 1 |
| F11014 | | F09010 | 2 | E14012 | | E14013 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 24 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E14013 | | E14012 | 2 | E17012 | | E16004 | 1 |
| E14014 | | A25012 | 1 | E17013 | | E16002 | 1 |
| E14015 | | E14016 | 1 | E17014 | | E18013 | 1 |
| E14016 | | E14015 | 1 | E17015 | | E18014 | 1 |
| E15002 | | E20004 | 1 | E18001 | | E19006 | 1 |
| E15002 | | E13002 | 2 | E18001 | | D16014 | 2 |
| E15003 | | D18011 | 2 | E18002 | | D16012 | 1 |
| E15003 | | E02007 | 1 | E18002 | | D20012 | 2 |
| E15004 | | E02006 | 1 | E18003 | | E11005 | 1 |
| E15005 | | E20005 | 1 | E18003 | | E18004 | 2 |
| E15005 | | F26003 | 2 | E18004 | | E18003 | 2 |
| E15006 | | C12011 | 1 | E18004 | | E18005 | 1 |
| E15006 | | E13003 | 2 | E18005 | | E18004 | 1 |
| E15007 | | E20012 | 1 | E18005 | | E18006 | 2 |
| E15009 | | C27012 | 1 | E18006 | | E18005 | 2 |
| F15010 | | F10013 | 1 | E18006 | | E18007 | 1 |
| E15010 | | C28002 | 2 | E18007 | | E18006 | 1 |
| E15011 | | JD31020 | 1 | E18007 | | E18009 | 2 |
| E15012 | | C17011 | 1 | E18009 | | E18007 | 2 |
| E15013 | | F05004 | 1 | E18009 | | E18010 | 1 |
| E15013 | | C24010 | 2 | F18010 | | E18009 | 1 |
| E15014 | | D14013 | 2 | E18010 | | E19014 | 2 |
| E15014 | | F05006 | 1 | F18012 | | E17001 | 1 |
| E15015 | | E15016 | 1 | F18013 | | E17014 | 1 |
| E15016 | | E15015 | 1 | E18014 | | E17015 | 1 |
| E16002 | | E17013 | 1 | E19002 | | E19005 | 2 |
| E16002 | | B18003 | 2 | F19002 | | E25001 | 1 |
| F16003 | | B16003 | 1 | E19003 | | C09012 | 2 |
| E16004 | | E17012 | 1 | E19004 | | E24012 | 1 |
| E16004 | | E19012 | 2 | E19004 | | D21014 | 2 |
| F16005 | | C24006 | 1 | F19005 | | E19014 | 1 |
| E16006 | | E17011 | 1 | E19005 | | E19002 | 2 |
| E16006 | | D13002 | 2 | F19006 | | E18001 | 1 |
| F16007 | | C24004 | 1 | F19009 | | E19013 | 1 |
| E16009 | | JF31003 | 1 | E19010 | | F23014 | 1 |
| F16010 | | E17010 | 1 | E19011 | | D13003 | 2 |
| F16010 | | F14014 | 2 | E19012 | | E16004 | 2 |
| E16011 | | C03011 | 1 | E19012 | | F24006 | 1 |
| E16012 | | E17009 | 1 | E19013 | | E19009 | 1 |
| E16013 | | F15014 | 1 | F19014 | | E18010 | 2 |
| F16013 | | A22010 | 2 | E19014 | | E19005 | 1 |
| E16014 | | E17005 | 1 | E19015 | | E19016 | 1 |
| E16014 | | C13005 | 2 | E19016 | | E19015 | 1 |
| E16015 | | E16016 | 1 | E20002 | | D20007 | 1 |
| E16016 | | E16015 | 1 | F20002 | | H16014 | 2 |
| E17001 | | E18012 | 1 | E20003 | | D20010 | 1 |
| E17002 | | B25004 | 1 | E20004 | | C12010 | 2 |
| F17005 | | E16014 | 1 | E20004 | | E15002 | 1 |
| F17005 | | F12006 | 2 | E20005 | | E15005 | 1 |
| E17009 | | E16012 | 1 | E20006 | | JC31010 | 1 |
| E17010 | | E16010 | 1 | E20007 | | C03002 | 1 |
| E17011 | | E16006 | 1 | E20009 | | C17014 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 25 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E20010 | B16007 | 1 | | E23003 | E23004 | 1 | |
| E20011 | E02005 | 1 | | E23004 | E23003 | 1 | |
| E20012 | E15007 | 1 | | E23004 | E23005 | 2 | |
| E20013 | E28004 | 1 | | E23005 | E23004 | 2 | |
| E20014 | F18014 | 1 | | E23005 | E23006 | 1 | |
| E20014 | B16012 | 2 | | E23006 | E23005 | 1 | |
| E20015 | E20016 | 1 | | E23006 | E23008 | 2 | |
| E20016 | E20015 | 1 | | E23007 | E24015 | 1 | |
| E21001 | E26006 | 2 | | E23007 | E22007 | 2 | |
| E21001 | E22001 | 1 | | E23008 | E23006 | 2 | |
| E21002 | E22002 | 2 | | E23009 | E24009 | 2 | |
| E21002 | F30002 | 1 | | E23009 | E28011 | 1 | |
| E21003 | E21004 | 1 | | E23010 | E24001 | 2 | |
| E21004 | E21003 | 1 | | E23010 | E28014 | 1 | |
| E21004 | E21005 | 2 | | E23011 | D07006 | 1 | |
| E21005 | E21004 | 2 | | E23012 | D21006 | 1 | |
| E21005 | E21006 | 1 | | E23013 | D21010 | 1 | |
| E21006 | E21005 | 1 | | E23014 | D06010 | 1 | |
| E21006 | E21008 | 2 | | E23015 | E22010 | 1 | |
| E21007 | E22007 | 1 | | E24001 | E24003 | 1 | |
| E21008 | E21006 | 2 | | E24001 | E23010 | 2 | |
| E21009 | E22009 | 2 | | F24002 | E25015 | 1 | |
| E21010 | E22015 | 1 | | F24002 | E23002 | 2 | |
| E21012 | D05002 | 1 | | E24003 | E25010 | 2 | |
| E21013 | D21002 | 1 | | F24003 | E24001 | 1 | |
| E21014 | D25011 | 1 | | E24004 | E24005 | 1 | |
| E22001 | E21001 | 1 | | F24005 | E24004 | 1 | |
| E22001 | E23001 | 2 | | E24005 | E24006 | 2 | |
| F22002 | E23002 | 1 | | E24006 | E24005 | 2 | |
| E22002 | E21002 | 2 | | E24006 | E24008 | 1 | |
| E22003 | E22004 | 1 | | E24007 | E24010 | 1 | |
| E22004 | E22003 | 1 | | E24007 | E29005 | 2 | |
| E22004 | E22005 | 2 | | F24008 | E24006 | 1 | |
| F22005 | E22004 | 2 | | E24009 | C28014 | 1 | |
| E22005 | E22006 | 1 | | F24009 | E23009 | 2 | |
| F22006 | E22005 | 1 | | E24010 | E12012 | 2 | |
| F22006 | E22008 | 2 | | E24010 | E24007 | 1 | |
| E22007 | E23007 | 2 | | E24011 | D21012 | 1 | |
| E22007 | E21007 | 1 | | E24012 | E19004 | 1 | |
| E22008 | E22006 | 2 | | E24013 | D16013 | 1 | |
| E22009 | E27001 | 1 | | E24014 | F10014 | 1 | |
| E22009 | E21009 | 2 | | F24015 | E23007 | 1 | |
| E22010 | E23015 | 1 | | E25001 | E19002 | 1 | |
| E22011 | D09006 | 1 | | E25001 | E25007 | 2 | |
| E22012 | D25010 | 1 | | E25002 | D22012 | 2 | |
| E22013 | F20004 | 1 | | E25002 | A22002 | 1 | |
| E22014 | D21004 | 1 | | E25003 | E25004 | 1 | |
| E22015 | E21010 | 1 | | E25003 | E25006 | 2 | |
| E23001 | E22001 | 2 | | E25004 | E25003 | 1 | |
| E23001 | E14002 | 1 | | E25004 | E25008 | 2 | |
| E23002 | E24002 | 2 | | E25005 | E14005 | 1 | |
| E23002 | E22002 | 1 | | E25005 | D11011 | 2 | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------|--------|-------------|---------|--------------------------------------|--------------|-------------|---------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 26 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL |
| E25006 | | E25003 | 2 | E28005 | | E28014 | 2 |
| E25007 | | E25001 | 2 | E28005 | | E27003 | 1 |
| E25007 | | E25010 | 1 | E28006 | | F18002 | 1 |
| E25008 | | E25004 | 2 | E28009 | | B27013 | 1 |
| E25009 | | F30004 | 1 | E28011 | | E23009 | 1 |
| E25010 | | E25007 | 1 | E28011 | | E27001 | 2 |
| E25010 | | E24003 | 2 | E28012 | | E27002 | 2 |
| E25015 | | E24002 | 1 | E28013 | | A25011 | 2 |
| E26001 | | F13012 | 1 | E28014 | | E23010 | 1 |
| E26002 | | C10012 | 2 | E28014 | | E28005 | 2 |
| E26002 | | F27010 | 1 | F28015 | | E28016 | 1 |
| E26003 | | C09005 | 2 | E28016 | | E28015 | 1 |
| E26003 | | E26004 | 1 | E29002 | | E11009 | 1 |
| E26004 | | E26003 | 1 | E29003 | | F14009 | 1 |
| E26004 | | E26005 | 2 | E29004 | | F18005 | 1 |
| E26005 | | E26004 | 2 | E29005 | | E24007 | 2 |
| E26005 | | E26006 | 1 | E29006 | | B27002 | 2 |
| E26006 | | E26005 | 1 | E29007 | | F24003 | 1 |
| E26006 | | E21001 | 2 | E29009 | | E26009 | 1 |
| E26007 | | C23003 | 1 | E29010 | | F10007 | 1 |
| E26007 | | F13006 | 2 | E29010 | | C16011 | 2 |
| E26009 | | E29009 | 1 | E29011 | | D29009 | 1 |
| E26010 | | E27010 | 2 | E29011 | | F20003 | 2 |
| E26010 | | F29002 | 1 | E29012 | | E27007 | 2 |
| E26012 | | F18010 | 1 | E29013 | | E27013 | 1 |
| E26013 | | B16011 | 1 | E29013 | | A27003 | 2 |
| E26014 | | B16010 | 1 | E29014 | | E27014 | 1 |
| E27001 | | E28011 | 2 | E29014 | | A27013 | 2 |
| E27001 | | E22009 | 1 | E29015 | | E29016 | 1 |
| E27002 | | F19009 | 1 | E29016 | | E29015 | 1 |
| E27002 | | E28012 | 2 | E30002 | | D08007 | 2 |
| E27003 | | E28005 | 1 | F30002 | | F27003 | 1 |
| E27003 | | E27009 | 2 | E30003 | | F10005 | 1 |
| E27004 | | E27005 | 1 | E30004 | | B16009 | 1 |
| E27005 | | E27004 | 1 | E30004 | | F08004 | 2 |
| E27005 | | E27006 | 2 | E30005 | | F15004 | 1 |
| E27006 | | E27005 | 2 | E30006 | | JC31018 | 1 |
| E27006 | | E27008 | 1 | E30006 | | E13005 | 2 |
| E27007 | | E29012 | 2 | E30007 | | F26002 | 1 |
| E27007 | | F08003 | 1 | E30009 | | C18002 | 1 |
| E27008 | | E27006 | 1 | E30010 | | D19003 | 2 |
| E27009 | | E27003 | 2 | E30013 | | C18006 | 1 |
| E27009 | | E27010 | 1 | E30014 | | D19011 | 1 |
| E27010 | | E27009 | 1 | F30015 | | E30016 | 1 |
| E27010 | | E26010 | 2 | E30016 | | E30015 | 1 |
| E27013 | | E29013 | 1 | E31030 | | E31038 | 1 |
| E27014 | | E29014 | 1 | E31038 | | E31030 | 1 |
| E28002 | | B25010 | 2 | E31038 | | E31046 | 2 |
| E28002 | | E28003 | 1 | F31046 | | E31038 | 2 |
| E28003 | | E28002 | 1 | E31046 | | E04008 | 1 |
| E28003 | | JF31024 | 2 | F01002 | | B24014 | 2 |
| E28004 | | E20013 | 1 | F01003 | | B18011 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 27 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F01004 | | D22003 | 2 | F05002 | | E12007 | 1 |
| F01005 | | JF31007 | 2 | F05003 | | D12009 | 1 |
| F01006 | | F03013 | 1 | F05004 | | E15013 | 1 |
| F01007 | | F04009 | 1 | F05005 | | C04014 | 2 |
| F01008 | | F04007 | 1 | F05006 | | E15014 | 1 |
| F01009 | | F04005 | 1 | F05007 | | C09002 | 1 |
| F01010 | | F03007 | 1 | F05008 | | F31046 | 1 |
| F01011 | | F03009 | 1 | F05009 | | F09014 | 1 |
| F01012 | | F01015 | 2 | F05010 | | C29011 | 2 |
| F01013 | | F01014 | 1 | F05011 | | F19013 | 1 |
| F01013 | | F02008 | 2 | F05012 | | E14003 | 1 |
| F01014 | | F06007 | 2 | F05013 | | C06007 | 1 |
| F01014 | | F01013 | 1 | F05014 | | C13002 | 2 |
| F01015 | | C20005 | 1 | F05015 | | F05016 | 1 |
| F01015 | | F01012 | 2 | F05016 | | F05015 | 1 |
| F02002 | | B06003 | 1 | F06002 | | F03005 | 1 |
| F02003 | | F06008 | 1 | F06003 | | F03003 | 1 |
| F02004 | | C10009 | 1 | F06004 | | F04011 | 1 |
| F02005 | | F06013 | 1 | F06005 | | F04013 | 1 |
| F02008 | | F01013 | 2 | F06006 | | F03011 | 1 |
| F02015 | | F02016 | 1 | F06007 | | F01014 | 2 |
| F02016 | | F02015 | 1 | F06008 | | F02003 | 1 |
| F03002 | | B11014 | 1 | F06013 | | F02005 | 1 |
| F03003 | | F06003 | 1 | F06015 | | F04003 | 1 |
| F03004 | | B11002 | 1 | F08002 | | F27009 | 2 |
| F03005 | | F06002 | 1 | F08002 | | F08011 | 1 |
| F03006 | | B20014 | 1 | F08003 | | E27007 | 1 |
| F03007 | | F01010 | 1 | F08003 | | F10013 | 2 |
| F03009 | | F01011 | 1 | F08004 | | E30004 | 2 |
| F03010 | | B20002 | 1 | F08005 | | D14012 | 1 |
| F03011 | | F06006 | 1 | F08007 | | C26012 | 1 |
| F03012 | | B09006 | 1 | F08010 | | F09013 | 1 |
| F03012 | | JF31001 | 2 | F08011 | | F29002 | 2 |
| F03013 | | F01006 | 1 | F08011 | | F08002 | 1 |
| F03014 | | JF31002 | 2 | F08012 | | D03005 | 1 |
| F03015 | | F03016 | 1 | F08013 | | D19004 | 1 |
| F03016 | | F03015 | 1 | F08013 | | F08014 | 2 |
| F04002 | | B14014 | 1 | F08014 | | F08013 | 2 |
| F04003 | | F06015 | 1 | F08015 | | F08016 | 1 |
| F04004 | | B14002 | 1 | F08016 | | F08015 | 1 |
| F04005 | | F01009 | 1 | F09002 | | F15014 | 2 |
| F04006 | | B13014 | 1 | F09003 | | JC31013 | 1 |
| F04007 | | F01008 | 1 | F09003 | | F18003 | 2 |
| F04008 | | F31036 | 1 | F09004 | | F14002 | 1 |
| F04009 | | F01007 | 1 | F09005 | | C07003 | 2 |
| F04010 | | B13002 | 1 | F09006 | | JD31009 | 1 |
| F04011 | | F06004 | 1 | F09007 | | F24011 | 1 |
| F04012 | | B12014 | 1 | F09009 | | F23002 | 1 |
| F04013 | | F06005 | 1 | F09010 | | F14007 | 1 |
| F04014 | | B12002 | 1 | F09010 | | E11014 | 2 |
| F04015 | | F04016 | 1 | F09011 | | C07010 | 1 |
| F04016 | | F04015 | 1 | F09011 | | F24010 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 28 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F09012 | | D17014 | 1 | F14007 | | F09010 | 1 |
| F09013 | | F08010 | 1 | F14009 | | E29003 | 1 |
| F09013 | | B24002 | 2 | F14011 | | E11011 | 2 |
| F09014 | | F05009 | 1 | F14012 | | A22012 | 1 |
| F09015 | | F09016 | 1 | F14013 | | F24009 | 1 |
| F09016 | | F09015 | 1 | F14013 | | F14003 | 2 |
| F10002 | | E12013 | 1 | F14014 | | E16010 | 2 |
| F10003 | | E12005 | 2 | F14014 | | F14005 | 1 |
| F10004 | | F15003 | 1 | F14015 | | F14016 | 1 |
| F10005 | | E30003 | 1 | F14016 | | F14015 | 1 |
| F10006 | | D08009 | 1 | F15002 | | C02009 | 1 |
| F10006 | | F20014 | 2 | F15003 | | F10004 | 1 |
| F10007 | | E29010 | 1 | F15003 | | F15006 | 2 |
| F10009 | | C29014 | 1 | F15004 | | E30005 | 1 |
| F10010 | | B27004 | 1 | F15004 | | A25010 | 2 |
| F10011 | | F20007 | 1 | F15005 | | C23007 | 1 |
| F10012 | | B22012 | 1 | F15006 | | F15003 | 2 |
| F10013 | | F08003 | 2 | F15006 | | C03014 | 1 |
| F10013 | | E15010 | 1 | F15007 | | B30009 | 1 |
| F10014 | | E24014 | 1 | F15009 | | C08014 | 1 |
| F10015 | | F10016 | 1 | F15010 | | B26006 | 2 |
| F10016 | | F10015 | 1 | F15010 | | F15011 | 1 |
| F12002 | | F16003 | 2 | F15011 | | F15010 | 1 |
| F12003 | | J031005 | 1 | F15014 | | E16013 | 1 |
| F12004 | | F26010 | 1 | F15014 | | F09002 | 2 |
| F12006 | | E17005 | 2 | F15015 | | F15016 | 1 |
| F12009 | | B14009 | 1 | F15016 | | F15015 | 1 |
| F12010 | | F21005 | 2 | F16001 | | F16006 | 1 |
| F12011 | | B07007 | 1 | F16003 | | E02004 | 1 |
| F12015 | | F12016 | 1 | F16003 | | F12002 | 2 |
| F12016 | | F12015 | 1 | F16004 | | E13007 | 1 |
| F13002 | | B26003 | 2 | F16005 | | F26007 | 1 |
| F13003 | | C26003 | 2 | F16006 | | F16008 | 2 |
| F13004 | | C27013 | 1 | F16006 | | F16001 | 1 |
| F13005 | | F18011 | 1 | F16007 | | F26004 | 1 |
| F13006 | | E26007 | 2 | F16008 | | F16006 | 2 |
| F13007 | | C16010 | 1 | F16009 | | E06007 | 2 |
| F13009 | | C26002 | 1 | F16009 | | D08011 | 1 |
| F13010 | | E13013 | 1 | F16010 | | E07013 | 1 |
| F13011 | | D23013 | 2 | F16011 | | E07003 | 1 |
| F13012 | | E26001 | 1 | F16012 | | E07010 | 1 |
| F13013 | | E11004 | 1 | F16013 | | E07007 | 2 |
| F13013 | | JF31006 | 2 | F16013 | | D06011 | 1 |
| F13014 | | F19005 | 1 | F16014 | | D17002 | 1 |
| F13015 | | F13016 | 1 | F16015 | | D15014 | 1 |
| F13016 | | F13015 | 1 | F17002 | | F26009 | 1 |
| F14002 | | F09004 | 1 | F17003 | | F17007 | 1 |
| F14003 | | F14013 | 2 | F17003 | | F13006 | 2 |
| F14003 | | C03005 | 1 | F17004 | | E03014 | 2 |
| F14004 | | C07012 | 1 | F17005 | | E13009 | 1 |
| F14004 | | F18006 | 2 | F17006 | | F28005 | 1 |
| F14005 | | F14014 | 1 | F17007 | | F17003 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 29 | E |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F17010 | B16006 | | 1 | F20012 | B17003 | | 1 |
| F17011 | F21003 | | 1 | F20013 | F25002 | | 1 |
| F17011 | F17014 | | 2 | F20014 | F10006 | | 2 |
| F17012 | F30010 | | 1 | F20015 | F20016 | | 1 |
| F17013 | F19006 | | 2 | F20016 | F20015 | | 1 |
| F17014 | F17011 | | 2 | F21001 | F28007 | | 2 |
| F17015 | F17016 | | 1 | F21001 | C11010 | | 1 |
| F17016 | F17015 | | 1 | F21002 | D03002 | | 1 |
| F18002 | E28006 | | 1 | F21002 | F21003 | | 2 |
| F18003 | F09003 | | 2 | F21003 | F21002 | | 2 |
| F18003 | F25010 | | 1 | F21003 | F17011 | | 1 |
| F18004 | F18005 | | 2 | F21004 | D12014 | | 1 |
| F18005 | E29004 | | 1 | F21005 | F28002 | | 1 |
| F18005 | F18004 | | 2 | F21005 | F12010 | | 2 |
| F18006 | F14004 | | 2 | F21006 | F22015 | | 1 |
| F18007 | F19006 | | 1 | F21007 | F22002 | | 2 |
| F18009 | F19010 | | 1 | F21009 | F19011 | | 1 |
| F18010 | E26012 | | 1 | F21009 | A25013 | | 2 |
| F18010 | F18014 | | 2 | F21010 | F21011 | | 2 |
| F18011 | C23005 | | 2 | F21010 | E14012 | | 1 |
| F18011 | F13005 | | 1 | F21011 | C15006 | | 1 |
| F18014 | F18010 | | 2 | F21011 | F21010 | | 2 |
| F18014 | E20014 | | 1 | F21012 | F30014 | | 1 |
| F18015 | F18016 | | 1 | F21014 | F22013 | | 1 |
| F18016 | F18015 | | 1 | F21015 | F22004 | | 2 |
| F19002 | A13010 | | 1 | F22001 | F22002 | | 1 |
| F19003 | D26014 | | 1 | F22002 | F22001 | | 1 |
| F19004 | C23006 | | 1 | F22002 | F21007 | | 2 |
| F19005 | F13014 | | 1 | F22003 | F22004 | | 1 |
| F19006 | F18007 | | 1 | F22004 | F22003 | | 1 |
| F19006 | F17013 | | 2 | F22004 | F21015 | | 2 |
| F19007 | C11005 | | 1 | | | | |
| F19009 | E27002 | | 1 | PE54029 | F22007 | F22008 | 1 |
| F19010 | F18009 | | 1 | PE54029 | F22008 | F22007 | 1 |
| F19011 | F21009 | | 1 | PE54018 | F22009 | D20013 | 2 |
| F19012 | C05004 | | 1 | PE54029 | F22010 | F26012 | 2 |
| F19013 | F05011 | | 1 | | F22013 | F21014 | 1 |
| F19014 | D28010 | | 1 | | F22014 | F22016 | 1 |
| F19015 | F19016 | | 1 | | F22015 | F21006 | 1 |
| F19016 | F19015 | | 1 | | F22016 | F22014 | 1 |
| F20002 | D07007 | | 1 | | F23002 | F09009 | 1 |
| F20003 | E29011 | | 2 | | F23002 | F24013 | 2 |
| F20003 | H26014 | | 1 | | F23003 | C07007 | 1 |
| F20004 | E22013 | | 1 | | F23004 | H13010 | 1 |
| F20004 | D08006 | | 2 | | F23005 | JC31007 | 1 |
| F20005 | C23009 | | 1 | | F23005 | F23011 | 2 |
| F20006 | D29013 | | 1 | | F23006 | E05013 | 1 |
| F20007 | F10011 | | 1 | | F23007 | C24005 | 1 |
| F20009 | E07009 | | 1 | | F23009 | E01001 | 1 |
| F20010 | JE31044 | | 1 | | F23010 | E13014 | 2 |
| F20010 | C19003 | | 2 | | F23010 | D16002 | 1 |
| F20011 | C20012 | | 1 | | F23011 | F23005 | 2 |
| | | | | | F23012 | E08010 | 1 |
| | | | | | F23013 | JC31032 | 1 |
| | | | | | F23014 | E19010 | 1 |
| | | | | | F23015 | F23016 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 30 | REV. D |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| | F23016 | F23015 | 1 | F27010 | E26002 | 1 | |
| | F24002 | B25009 | 1 | F27014 | D09007 | 1 | |
| | F24003 | E29007 | 1 | F27015 | D09009 | 1 | |
| | F24004 | JF31009 | 1 | F28002 | F21005 | 1 | |
| | F24005 | JC31029 | 1 | F28003 | B16003 | 2 | |
| | F24006 | E19012 | 1 | F28004 | E14011 | 1 | |
| | F24007 | C17013 | 1 | F28005 | F17006 | 1 | |
| | F24009 | F14013 | 1 | F28005 | D11003 | 2 | |
| | F24010 | F09011 | 2 | F28006 | F26012 | 1 | |
| | F24011 | F09007 | 1 | F28007 | F28009 | 1 | |
| | F24011 | C07013 | 2 | F28007 | F21001 | 2 | |
| | F24012 | B13006 | 1 | F28009 | F28007 | 1 | |
| | F24013 | F23002 | 2 | F28010 | E01014 | 1 | |
| | F24014 | C07006 | 1 | F28011 | E02014 | 1 | |
| | F24015 | F24016 | 1 | F28015 | F28016 | 1 | |
| | F24016 | F24015 | 1 | F28016 | F28015 | 1 | |
| | F25002 | F20013 | 1 | F29002 | E26010 | 1 | |
| | F25003 | C28003 | 1 | F29002 | F08011 | 2 | |
| | F25004 | D22011 | 2 | F29003 | D10011 | 1 | |
| | F25005 | D22006 | 1 | F29004 | F29005 | 1 | |
| | F25006 | JD31040 | 1 | F29005 | F29004 | 1 | |
| | F25007 | D16003 | 1 | F29005 | F29008 | 2 | |
| | F25009 | D05001 | 1 | F29006 | F29007 | 1 | |
| | F25010 | F18003 | 1 | F29007 | F29006 | 1 | |
| | F25011 | D26010 | 1 | F29007 | D09011 | 2 | |
| | F25012 | A19012 | 2 | F29008 | F29005 | 2 | |
| | F25013 | D26012 | 1 | F29008 | F29011 | 1 | |
| | F25014 | A19014 | 2 | F29009 | D27012 | 1 | |
| | F25015 | F25016 | 1 | F29010 | D09005 | 1 | |
| | F25016 | F25015 | 1 | F29011 | F29008 | 1 | |
| | F26002 | E30007 | 1 | F29011 | F29012 | 2 | |
| | F26003 | E15005 | 2 | F29012 | F29011 | 2 | |
| | F26003 | F26005 | 1 | F29013 | D10005 | 1 | |
| | F26004 | F16007 | 1 | F29014 | D13011 | 2 | |
| | F26005 | F26003 | 1 | F29014 | C30002 | 1 | |
| | F26006 | E13005 | 1 | F29015 | F29016 | 1 | |
| | F26007 | F16005 | 1 | F29016 | F29015 | 1 | |
| | F26009 | F17002 | 1 | F30002 | E21002 | 1 | |
| | F26010 | F12004 | 1 | F30002 | F30003 | 2 | |
| | F26011 | C05010 | 1 | F30003 | F30002 | 2 | |
| | F26011 | C07014 | 2 | F30003 | D13006 | 1 | |
| PE54029 | F26012 | F22010 | 2 | F30004 | E25009 | 1 | |
| | F26012 | F28006 | 1 | F30005 | F30014 | 2 | |
| | F26013 | E01010 | 1 | F30005 | A25014 | 1 | |
| | F26014 | E01011 | 1 | F30006 | D25002 | 1 | |
| | F26015 | F26016 | 1 | F30007 | B20013 | 1 | |
| | F26016 | F26015 | 1 | F30009 | C16002 | 2 | |
| | F27001 | E12009 | 1 | F30010 | F30011 | 2 | |
| | F27001 | B30001 | 2 | F30010 | F17012 | 1 | |
| | F27002 | F27003 | 2 | F30011 | JF31010 | 1 | |
| | F27003 | E30002 | 1 | F30011 | F30010 | 2 | |
| | F27003 | F27002 | 2 | F30012 | B20003 | 1 | |
| | F27009 | F08002 | 2 | | | | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 31 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F30013 | B18007 | | 1 | JA31014 | B15010 | | 1 |
| F30014 | F21012 | | 1 | JA31015 | A01001 | | 1 |
| F30014 | F30005 | | 2 | JA31017 | JA31037 | | 2 |
| F30015 | F30016 | | 1 | JA31017 | JA31041 | | 1 |
| F30016 | F30015 | | 1 | JA31018 | A02006 | | 1 |
| F31026 | F31027 | | 1 | JA31019 | A02007 | | 1 |
| F31027 | F31026 | | 1 | JA31020 | JA31041 | | 2 |
| F31027 | F31028 | | 2 | JA31020 | A05008 | | 1 |
| F31028 | F31027 | | 2 | JA31021 | A03006 | | 1 |
| F31028 | F31030 | | 1 | JA31022 | A01004 | | 1 |
| F31030 | F31028 | | 1 | JA31023 | A08004 | | 1 |
| F31030 | F31032 | | 2 | JA31024 | B06013 | | 1 |
| F31032 | F31030 | | 2 | JA31025 | A03002 | | 1 |
| F31032 | F31033 | | 1 | JA31026 | H06010 | | 1 |
| F31033 | F31032 | | 1 | JA31027 | B09010 | | 1 |
| F31033 | F31034 | | 2 | JA31028 | A02007 | | 1 |
| F31034 | F31033 | | 2 | JA31029 | B10013 | | 1 |
| F31034 | F31035 | | 1 | JA31032 | JA31009 | | 2 |
| F31035 | F31034 | | 1 | JA31033 | A04004 | | 1 |
| F31035 | F31036 | | 2 | JA31034 | A03008 | | 1 |
| F31036 | F31035 | | 2 | JA31035 | B15013 | | 1 |
| F31036 | F04008 | | 1 | JA31036 | H15009 | | 1 |
| F31037 | F31038 | | 1 | JA31037 | JA31017 | | 2 |
| F31038 | F31037 | | 1 | JA31037 | JA31013 | | 1 |
| F31038 | F31040 | | 2 | JA31038 | A01002 | | 1 |
| F31040 | F31038 | | 2 | JA31040 | A02005 | | 1 |
| F31040 | F31041 | | 1 | JA31041 | JA31017 | | 1 |
| F31041 | F31040 | | 1 | JA31041 | JA31020 | | 2 |
| F31041 | F31042 | | 2 | JA31042 | A02008 | | 1 |
| F31042 | F31041 | | 2 | JA31043 | A03005 | | 1 |
| F31042 | F31043 | | 1 | JA31044 | A01003 | | 1 |
| F31043 | F31042 | | 1 | JA31045 | A08003 | | 1 |
| F31043 | F31044 | | 2 | JA31046 | A08005 | | 1 |
| F31044 | F31043 | | 2 | JR31001 | B07009 | | 1 |
| F31044 | F31045 | | 1 | JR31002 | B08014 | | 1 |
| F31045 | F31044 | | 1 | JR31003 | B08009 | | 1 |
| F31045 | F31046 | | 2 | JR31004 | B09014 | | 1 |
| F31046 | F31045 | | 2 | JR31005 | A04002 | | 1 |
| F31046 | F05008 | | 1 | JR31006 | A02001 | | 1 |
| JA31001 | B06014 | | 1 | JR31007 | A03003 | | 1 |
| JA31002 | A03001 | | 1 | JR31009 | B10009 | | 1 |
| JA31003 | B06009 | | 1 | JR31010 | A04007 | | 1 |
| JA31004 | B09009 | | 1 | JR31011 | B07014 | | 1 |
| JA31005 | A02004 | | 1 | JR31012 | B01014 | | 1 |
| JA31006 | B10014 | | 1 | JR31013 | B01009 | | 1 |
| JA31007 | A08002 | | 1 | JR31014 | B02014 | | 1 |
| JA31009 | JC31035 | | 1 | JR31015 | B02009 | | 1 |
| JA31009 | JA31032 | | 2 | JR31017 | B03014 | | 1 |
| JA31010 | A04003 | | 1 | JR31018 | B03009 | | 1 |
| JA31011 | A03007 | | 1 | JR31019 | B04014 | | 1 |
| JA31012 | B15014 | | 1 | JR31020 | B04009 | | 1 |
| JA31013 | JA31037 | | 1 | JR31021 | B05014 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304B/C) | | | | | | 32 | D |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| JR31022 | B05009 | | 1 | JD31003 | | D02009 | 1 |
| JR31023 | A04006 | | 1 | JD31004 | | D02011 | 1 |
| JR31024 | B07010 | | 1 | JD31005 | | F12003 | 1 |
| JR31025 | B08013 | | 1 | JD31006 | | D26005 | 1 |
| JR31026 | B08010 | | 1 | JD31009 | | F09006 | 1 |
| JR31027 | B09013 | | 1 | JD31010 | | E05001 | 1 |
| JR31028 | A04001 | | 1 | JD31011 | | C14013 | 1 |
| JR31029 | A02002 | | 1 | JD31013 | | D27005 | 1 |
| JR31030 | A03004 | | 1 | JD31014 | | C14011 | 1 |
| JR31032 | B10010 | | 1 | JD31015 | | C02014 | 1 |
| JR31033 | A04008 | | 1 | JD31017 | | D12002 | 1 |
| JR31034 | B07013 | | 1 | JD31020 | | B17013 | 2 |
| JR31035 | B01013 | | 1 | JD31020 | | E15011 | 1 |
| JR31036 | B01010 | | 1 | JD31021 | | B17014 | 2 |
| JR31037 | B02013 | | 1 | JD31022 | | B21006 | 1 |
| JR31038 | B02010 | | 1 | JD31023 | | D20014 | 1 |
| JR31040 | B03013 | | 1 | JD31024 | | D26003 | 1 |
| JR31041 | B03010 | | 1 | JD31025 | | D02007 | 1 |
| JR31042 | B04013 | | 1 | JD31027 | | E05015 | 1 |
| JR31043 | B04010 | | 1 | JD31028 | | C25002 | 1 |
| JR31044 | B05013 | | 1 | JD31029 | | D26007 | 1 |
| JR31045 | B05010 | | 1 | JD31033 | | C07003 | 1 |
| JR31046 | A04005 | | 1 | JD31035 | | D27002 | 1 |
| JC31001 | E12006 | | 1 | JD31037 | | D12006 | 1 |
| JC31002 | C03006 | | 1 | JD31040 | | F25006 | 1 |
| JC31003 | C02006 | | 1 | JD31043 | | B21011 | 1 |
| JC31007 | F23005 | | 1 | JD31044 | | B21010 | 1 |
| JC31009 | C14005 | | 1 | JD31045 | | C06012 | 1 |
| JC31010 | E20006 | | 1 | JE31001 | | C18013 | 1 |
| JC31012 | B21004 | | 1 | JE31002 | | D01005 | 1 |
| JC31013 | F09003 | | 1 | JE31003 | | A30007 | 1 |
| JC31013 | A22009 | | 2 | JE31004 | | E03001 | 1 |
| JC31014 | D18012 | | 1 | JE31005 | | E07011 | 1 |
| JC31018 | E30006 | | 1 | JE31006 | | D01007 | 1 |
| JC31019 | C12010 | | 1 | JE31007 | | A29009 | 1 |
| JC31020 | B21002 | | 1 | JE31009 | | D01009 | 1 |
| JC31021 | C05002 | | 1 | JF31010 | | A29007 | 1 |
| JC31022 | B07006 | | 1 | JE31011 | | E03009 | 1 |
| JC31023 | B08002 | | 1 | JE31012 | | E07012 | 1 |
| JC31024 | B26002 | | 1 | JE31013 | | D01011 | 1 |
| JC31025 | E12002 | | 1 | JF31014 | | E04015 | 1 |
| JC31029 | F24005 | | 1 | JE31015 | | D26011 | 1 |
| JC31032 | F23013 | | 1 | JF31017 | | E04001 | 1 |
| JC31035 | JA31009 | | 1 | JE31019 | | D26013 | 1 |
| JC31036 | D22011 | | 1 | JE31020 | | D19012 | 1 |
| JC31037 | C25012 | | 1 | JE31021 | | E04010 | 1 |
| JC31040 | B08006 | | 1 | JE31022 | | D02005 | 1 |
| JC31041 | B09002 | | 1 | JE31023 | | C02013 | 1 |
| JC31042 | JC31043 | | 1 | JE31024 | | C18005 | 1 |
| JC31043 | B05012 | | 2 | JE31025 | | D01003 | 1 |
| JC31043 | JC31042 | | 1 | JE31026 | | A30009 | 1 |
| JD31001 | E04009 | | 1 | JF31027 | | E03015 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304B/C) | | | | WL | DOCUMENT NO. | SHEET NO. 33 | REV. D |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| JF31028 | | E07005 | 1 | | | | |
| JE31029 | | C18007 | 1 | | | | |
| JE31032 | | E03010 | 1 | | | | |
| JE31033 | | E07004 | 1 | | | | |
| JE31034 | | C18003 | 1 | | | | |
| JF31035 | | D26009 | 1 | | | | |
| JF31036 | | A28009 | 1 | | | | |
| JF31037 | | E06005 | 1 | | | | |
| JE31040 | | D01013 | 1 | | | | |
| JE31041 | | A28007 | 1 | | | | |
| JF31042 | | D02003 | 1 | | | | |
| JE31043 | | A27009 | 1 | | | | |
| JE31044 | | F20010 | 1 | | | | |
| JE31045 | | D17012 | 1 | | | | |
| JF31001 | | F03012 | 2 | | | | |
| JF31002 | | B06006 | 1 | | | | |
| JF31002 | | F03014 | 2 | | | | |
| JF31003 | | E16009 | 1 | | | | |
| JF31003 | | C02005 | 2 | | | | |
| JF31005 | | B05006 | 1 | | | | |
| JF31006 | | F13013 | 2 | | | | |
| JF31007 | | B26005 | 1 | | | | |
| JF31007 | | F01005 | 2 | | | | |
| JF31009 | | F24004 | 1 | | | | |
| JF31009 | | H18013 | 2 | | | | |
| JF31010 | | B15007 | 2 | | | | |
| JF31010 | | F30011 | 1 | | | | |
| JF31011 | | B03006 | 1 | | | | |
| JF31012 | | B03002 | 1 | | | | |
| JF31013 | | A26003 | 1 | | | | |
| JF31014 | | B05002 | 1 | | | | |
| JF31015 | | B04006 | 1 | | | | |
| JF31017 | | B04002 | 1 | | | | |
| JF31018 | | B23004 | 1 | | | | |
| JF31019 | | B02006 | 1 | | | | |
| JF31020 | | B01006 | 1 | | | | |
| JF31022 | | B01002 | 1 | | | | |
| JF31023 | | B02002 | 1 | | | | |
| JF31024 | | E28003 | 2 | | | | |
| JF31025 | | B14010 | 1 | | | | |
| JF31029 | | B15003 | 1 | | | | |

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WIRE LIST

| TITLE LOGIC BOARD WIRE WRAP (TB304A) (REF: 83249904) | | | | WL | DOCUMENT NO. | SHEET NO. 1 of 32 | REV. A |
|---------------------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|----------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A01001 | JA31015 | | 1 | A03008 | A07006 | | 2 |
| A01001 | A06010 | | 2 | A03009 | A12012 | | 1 |
| A01002 | JA3103A | | 1 | A03010 | A12013 | | 1 |
| A01002 | A06009 | | 2 | A03011 | A12003 | | 1 |
| A01003 | JA31044 | | 1 | A03012 | A12002 | | 1 |
| A01003 | A06007 | | 2 | A03013 | A11012 | | 1 |
| A01004 | JA31022 | | 1 | A03014 | A11013 | | 1 |
| A01004 | A06006 | | 2 | A03015 | A11003 | | 1 |
| A01013 | A15012 | | 1 | A03016 | A11002 | | 1 |
| A01014 | A15013 | | 1 | A04001 | JB3102A | | 1 |
| A01015 | A15003 | | 1 | A04001 | A08002 | | 2 |
| A01016 | A15002 | | 1 | A04002 | JB31005 | | 1 |
| A02001 | JB31006 | | 1 | A04002 | A08003 | | 2 |
| A02001 | A07011 | | 2 | A04003 | JA31010 | | 1 |
| A02002 | JB31029 | | 1 | A04003 | A08004 | | 2 |
| A02002 | A07012 | | 2 | A04004 | JA31033 | | 1 |
| A02003 | JA3102A | | 1 | A04004 | A08005 | | 2 |
| A02003 | A07013 | | 2 | A04005 | JB31046 | | 1 |
| A02004 | JA31005 | | 1 | A04005 | A08010 | | 2 |
| A02004 | A07014 | | 2 | A04006 | JB31023 | | 1 |
| A02005 | JA31040 | | 1 | A04006 | A08009 | | 2 |
| A02005 | A06002 | | 2 | A04007 | JB31010 | | 1 |
| A02006 | JA3101A | | 1 | A04007 | A08007 | | 2 |
| A02006 | A06003 | | 2 | A04008 | JB31033 | | 1 |
| A02007 | JA31019 | | 1 | A04008 | A08006 | | 2 |
| A02007 | A06004 | | 2 | A04009 | A10012 | | 1 |
| A02008 | JA31042 | | 1 | A04010 | A10013 | | 1 |
| A02008 | A06005 | | 2 | A04011 | A10003 | | 1 |
| A02009 | A14012 | | 1 | A04012 | A10002 | | 1 |
| A02010 | A14013 | | 1 | A04013 | A05012 | | 1 |
| A02011 | A14003 | | 1 | A04014 | A05013 | | 1 |
| A02012 | A14002 | | 1 | A04015 | A05003 | | 1 |
| A02013 | A13012 | | 1 | A04016 | A05002 | | 1 |
| A02014 | A13013 | | 1 | A05002 | A04016 | | 1 |
| A02015 | A13003 | | 1 | A05003 | A04015 | | 1 |
| A02016 | A13002 | | 1 | A05005 | A19009 | | 1 |
| A03001 | JA31002 | | 1 | A05006 | A05007 | | 1 |
| A03001 | A07002 | | 2 | A05007 | A05009 | | 2 |
| A03002 | JA31025 | | 1 | A05007 | A05006 | | 1 |
| A03002 | A07003 | | 2 | A05008 | JA31020 | | 1 |
| A03003 | JB31007 | | 1 | A05009 | A10006 | | 1 |
| A03003 | A07004 | | 2 | A05009 | A05007 | | 2 |
| A03004 | JB31030 | | 1 | A05010 | A16012 | | 1 |
| A03004 | A07005 | | 2 | A05012 | A04013 | | 1 |
| A03005 | JA31043 | | 1 | A05013 | A04014 | | 1 |
| A03005 | A07010 | | 2 | A05014 | A10014 | | 1 |
| A03006 | JA31021 | | 1 | A05015 | A05016 | | 1 |
| A03006 | A07009 | | 2 | A05016 | A05015 | | 1 |
| A03007 | JA31011 | | 1 | A06002 | A02005 | | 2 |
| A03007 | A07007 | | 2 | A06003 | A02006 | | 2 |
| A03008 | JA31034 | | 1 | A06004 | A02007 | | 2 |
| | | | | A06005 | A02008 | | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------|--------|-------------|---------|--------------------------------------|--------------|-------------|---------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 2 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTINATION | Z LEVEL |
| A06006 | | A01004 | 2 | A10009 | | A10007 | 1 |
| A06007 | | A01003 | 2 | A10010 | | A19011 | 1 |
| A06007 | | A09010 | 1 | A10012 | | A04009 | 1 |
| A06009 | | A01002 | 2 | A10013 | | A04010 | 1 |
| A06010 | | A01001 | 2 | A10014 | | A05014 | 1 |
| A07002 | | A03001 | 2 | A10014 | | A15014 | 2 |
| A07002 | | A09002 | 1 | A10015 | | A10016 | 1 |
| A07003 | | A03002 | 2 | A10016 | | A10015 | 1 |
| A07004 | | A03003 | 2 | A11002 | | A03016 | 1 |
| A07004 | | A09003 | 1 | A11003 | | A03015 | 1 |
| A07005 | | A03004 | 2 | A11005 | | A19012 | 1 |
| A07006 | | A03008 | 2 | A11006 | | A11007 | 2 |
| A07007 | | A03007 | 2 | A11006 | | A12009 | 1 |
| A07007 | | A09004 | 1 | A11007 | | A11009 | 1 |
| A07009 | | A03006 | 2 | A11007 | | A11006 | 2 |
| A07009 | | A09005 | 1 | A11009 | | C01002 | 2 |
| A07010 | | A03005 | 2 | A11009 | | A11007 | 1 |
| A07011 | | A02001 | 2 | A11010 | | A19013 | 1 |
| A07011 | | A09006 | 1 | A11012 | | A03013 | 1 |
| A07012 | | A02002 | 2 | A11013 | | A03014 | 1 |
| A07013 | | A02003 | 2 | A11014 | | A12014 | 2 |
| A07013 | | A09007 | 1 | A11014 | | B15012 | 1 |
| A07014 | | A02004 | 2 | A11015 | | A11016 | 1 |
| A08002 | | A04001 | 2 | A11016 | | A11015 | 1 |
| A08002 | | JA31007 | 1 | A12002 | | A03012 | 1 |
| A08003 | | A04002 | 2 | A12003 | | A03011 | 1 |
| A08003 | | JA31045 | 1 | A12005 | | C20006 | 1 |
| A08004 | | A04003 | 2 | A12006 | | A12007 | 1 |
| A08004 | | JA31023 | 1 | A12006 | | A13009 | 2 |
| A08005 | | A04004 | 2 | A12007 | | A12009 | 2 |
| A08005 | | JA31046 | 1 | A12007 | | A12006 | 1 |
| A08006 | | A04008 | 2 | A12009 | | A11006 | 1 |
| A08007 | | A04007 | 2 | A12009 | | A12007 | 2 |
| A08007 | | A09001 | 1 | A12010 | | D19003 | 1 |
| A08009 | | A04006 | 2 | A12012 | | A03009 | 1 |
| A08010 | | A04005 | 2 | A12013 | | A03010 | 1 |
| A09001 | | A08007 | 1 | A12014 | | A13014 | 1 |
| A09002 | | A07002 | 1 | A12014 | | A11014 | 2 |
| A09003 | | A07004 | 1 | A12015 | | A12016 | 1 |
| A09004 | | A07007 | 1 | A12016 | | A12015 | 1 |
| A09005 | | A07009 | 1 | A13002 | | A02016 | 1 |
| A09006 | | A07011 | 1 | A13003 | | A02015 | 1 |
| A09007 | | A07013 | 1 | A13005 | | D19010 | 1 |
| A09010 | | A06007 | 1 | A13006 | | A13007 | 2 |
| A10002 | | A04012 | 1 | A13006 | | A14009 | 1 |
| A10003 | | A04011 | 1 | A13007 | | A13009 | 1 |
| A10005 | | A19010 | 1 | A13007 | | A13006 | 2 |
| A10006 | | A10007 | 2 | A13009 | | A12006 | 2 |
| A10006 | | A05009 | 1 | A13009 | | A13007 | 1 |
| A10007 | | A10009 | 1 | A13010 | | F19002 | 1 |
| A10007 | | A10006 | 2 | A13012 | | A02013 | 1 |
| A10009 | | A15006 | 2 | A13013 | | A02014 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 3 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A13014 | A14014 | | 2 | A17005 | A19002 | | 2 |
| A13014 | A12014 | | 1 | A17006 | A20009 | | 1 |
| A13015 | A13016 | | 1 | A17006 | C15007 | | 2 |
| A13016 | A13015 | | 1 | A17007 | A18015 | | 1 |
| A14002 | A02012 | | 1 | A17007 | A17010 | | 2 |
| A14003 | A02011 | | 1 | A17009 | B22004 | | 2 |
| A14005 | C25014 | | 1 | A17009 | A18009 | | 1 |
| A14006 | A14009 | | 2 | A17010 | A17007 | | 2 |
| A14006 | A15009 | | 1 | A17015 | B24010 | | 1 |
| A14007 | A25003 | | 2 | A18001 | A18007 | | 1 |
| A14007 | C05013 | | 1 | A18001 | A18010 | | 2 |
| A14009 | A13006 | | 1 | A18002 | A17002 | | 2 |
| A14009 | A14006 | | 2 | A18003 | A19008 | | 2 |
| A14010 | B25009 | | 2 | A18004 | A19007 | | 2 |
| A14012 | A02009 | | 1 | A18005 | A19006 | | 2 |
| A14013 | A02010 | | 1 | A18006 | A19005 | | 2 |
| A14014 | A15014 | | 1 | A18007 | A24003 | | 2 |
| A14014 | A13014 | | 2 | A18007 | A18001 | | 1 |
| A14015 | A14016 | | 1 | A18009 | A17009 | | 1 |
| A14016 | A14015 | | 1 | A18010 | A18001 | | 2 |
| A15002 | A01016 | | 1 | A18010 | A17001 | | 1 |
| A15003 | A01015 | | 1 | A18015 | A17007 | | 1 |
| A15005 | A19015 | | 1 | A19001 | A16012 | | 2 |
| A15006 | A15007 | | 1 | A19001 | B24006 | | 1 |
| A15006 | A10009 | | 2 | A19002 | A20010 | | 1 |
| A15007 | A15009 | | 2 | A19002 | A17005 | | 2 |
| A15007 | A15006 | | 1 | A19003 | A20011 | | 1 |
| A15009 | A14006 | | 1 | A19003 | A17004 | | 2 |
| A15009 | A15007 | | 2 | A19004 | A20012 | | 1 |
| A15010 | A19014 | | 1 | A19004 | A17003 | | 2 |
| A15012 | A01013 | | 1 | A19005 | A20013 | | 1 |
| A15013 | A01014 | | 1 | A19005 | A18006 | | 2 |
| A15014 | A10014 | | 2 | A19006 | A20014 | | 1 |
| A15014 | A14014 | | 1 | A19006 | A18005 | | 2 |
| A15015 | A15016 | | 1 | A19007 | A20015 | | 1 |
| A15016 | A15015 | | 1 | A19007 | A18004 | | 2 |
| A16004 | A23010 | | 2 | A19008 | A20016 | | 1 |
| A16005 | A21007 | | 1 | A19008 | A18003 | | 2 |
| A16006 | A21009 | | 2 | A19009 | A05005 | | 1 |
| A16007 | B18005 | | 1 | A19009 | C01005 | | 2 |
| A16011 | B24011 | | 1 | A19010 | A10005 | | 1 |
| A16012 | A05010 | | 1 | A19010 | B26005 | | 2 |
| A16012 | A19001 | | 2 | A19011 | A10010 | | 1 |
| A16013 | A17002 | | 1 | A19011 | C05014 | | 2 |
| A16014 | B24007 | | 1 | A19012 | A11005 | | 1 |
| A16015 | A16016 | | 1 | A19012 | F25012 | | 2 |
| A16016 | A16015 | | 1 | A19013 | A11010 | | 1 |
| A17001 | A18010 | | 1 | A19013 | B18011 | | 2 |
| A17002 | A16013 | | 1 | A19014 | A15010 | | 1 |
| A17002 | A18002 | | 2 | A19014 | F25014 | | 2 |
| A17003 | A19004 | | 2 | A19015 | A15005 | | 1 |
| A17004 | A19003 | | 2 | A19015 | D22002 | | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 4 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A20001 | A20002 | 1 | | A23002 | A23001 | 1 | |
| A20002 | A20001 | 1 | | A23002 | A24015 | 2 | |
| A20002 | A20003 | 2 | | A23003 | A23004 | 1 | |
| A20003 | A20002 | 2 | | A23004 | A23003 | 1 | |
| A20003 | A20004 | 1 | | A23004 | A22015 | 2 | |
| A20004 | A20003 | 1 | | A23005 | A23006 | 1 | |
| A20004 | A20005 | 2 | | A23006 | A23005 | 1 | |
| A20005 | A20004 | 2 | | A23006 | A24007 | 2 | |
| A20005 | A20006 | 1 | | A23007 | C20003 | 1 | |
| A20006 | A20005 | 1 | | A23009 | A23010 | 1 | |
| A20006 | A20007 | 2 | | A23010 | A23009 | 1 | |
| A20007 | A20006 | 2 | | A23010 | A16004 | 2 | |
| A20007 | A20008 | 1 | | A23011 | B21007 | 1 | |
| A20008 | A20007 | 1 | | A23011 | A24006 | 2 | |
| A20009 | A17006 | 1 | | A23012 | A23014 | 1 | |
| A20010 | A19002 | 1 | | A23013 | A22014 | 1 | |
| A20011 | A19003 | 1 | | A23014 | A23012 | 1 | |
| A20012 | A19004 | 1 | | A23014 | A23016 | 2 | |
| A20013 | A19005 | 1 | | A23015 | A24014 | 2 | |
| A20014 | A19006 | 1 | | A23016 | A23014 | 2 | |
| A20015 | A19007 | 1 | | A24001 | A24008 | 2 | |
| A20016 | A19008 | 1 | | A24002 | A24011 | 2 | |
| A21001 | A21002 | 1 | | A24002 | A24003 | 1 | |
| A21002 | A21001 | 1 | | A24003 | A24002 | 1 | |
| A21002 | B25015 | 2 | | A24003 | A18007 | 2 | |
| A21003 | A21004 | 1 | | A24004 | B20006 | 1 | |
| A21004 | A21003 | 1 | | A24005 | D03009 | 1 | |
| A21004 | B25007 | 2 | | A24006 | A23011 | 2 | |
| A21005 | A21011 | 1 | | A24007 | A23006 | 2 | |
| A21007 | A16005 | 1 | | A24008 | A24009 | 1 | |
| A21009 | A21010 | 1 | | A24008 | A24001 | 2 | |
| A21009 | A16006 | 2 | | A24009 | A24008 | 1 | |
| A21010 | A21009 | 1 | | A24010 | A22003 | 2 | |
| A21011 | A21005 | 1 | | A24010 | A24011 | 1 | |
| A21011 | A21014 | 2 | | A24011 | A24010 | 1 | |
| A21012 | B21005 | 1 | | A24011 | A24002 | 2 | |
| A21012 | B14010 | 2 | | A24012 | D14004 | 1 | |
| A21013 | B25006 | 1 | | A24013 | D20005 | 1 | |
| A21014 | A21011 | 2 | | A24014 | B21003 | 1 | |
| A21014 | A21016 | 1 | | A24014 | A23015 | 2 | |
| A21015 | B25014 | 1 | | A24015 | A23002 | 2 | |
| A21016 | A21014 | 1 | | A25002 | C30002 | 2 | |
| A22001 | A22008 | 1 | | A25003 | D18005 | 1 | |
| A22002 | E25002 | 1 | | A25003 | A14007 | 2 | |
| A22002 | B15006 | 2 | | A25004 | D28002 | 1 | |
| A22003 | A27004 | 1 | | A25005 | B27013 | 2 | |
| A22003 | A24010 | 2 | | A25005 | C26012 | 2 | |
| A22004 | B24003 | 1 | | A25006 | A25010 | 1 | |
| A22008 | A22001 | 1 | | A25007 | C29004 | 1 | |
| A22014 | A23013 | 1 | | A25009 | C29012 | 1 | |
| A22015 | A23004 | 2 | | A25010 | F15004 | 2 | |
| A23001 | A23002 | 1 | | A25010 | A25006 | 1 | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 5 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| A25011 | | C28002 | 1 | A28009 | | JE31036 | 1 |
| A25011 | | E28013 | 2 | A28010 | | A28008 | 2 |
| A25012 | | E14014 | 1 | A28011 | | B11004 | 1 |
| A25013 | | F21009 | 2 | A28012 | | B12011 | 1 |
| A25014 | | F30005 | 1 | A28013 | | A27013 | 1 |
| A25015 | | A25016 | 1 | A28013 | | A29013 | 2 |
| A25016 | | A25015 | 1 | A28015 | | B30004 | 1 |
| A26001 | | B30001 | 1 | A29001 | | A26007 | 1 |
| A26002 | | C25013 | 1 | A29003 | | A28003 | 2 |
| A26002 | | A26003 | 2 | A29003 | | A30003 | 1 |
| A26003 | | A26002 | 2 | A29004 | | B13005 | 1 |
| A26003 | | JF31013 | 1 | A29005 | | B11012 | 1 |
| A26004 | | A30015 | 1 | A29006 | | A29008 | 1 |
| A26004 | | B29006 | 2 | A29007 | | JE31010 | 1 |
| A26005 | | A30001 | 1 | A29008 | | A29006 | 1 |
| A26005 | | B29005 | 2 | A29008 | | A29010 | 2 |
| A26006 | | A29015 | 1 | A29009 | | JE31007 | 1 |
| A26006 | | B29004 | 2 | A29010 | | A29008 | 2 |
| A26007 | | A29001 | 1 | A29011 | | B12004 | 1 |
| A26007 | | B29003 | 2 | A29012 | | B13011 | 2 |
| A26009 | | B30009 | 2 | A29013 | | A28013 | 2 |
| A26010 | | B18012 | 1 | A29013 | | A30013 | 1 |
| A26010 | | B30010 | 2 | A29015 | | A26006 | 1 |
| A26012 | | B30002 | 1 | A30001 | | A26005 | 1 |
| A26013 | | B29012 | 1 | A30003 | | A29003 | 1 |
| A26014 | | B29011 | 1 | A30004 | | B14005 | 2 |
| A26015 | | B29010 | 1 | A30005 | | B12012 | 1 |
| A27001 | | B30007 | 1 | A30006 | | A30008 | 1 |
| A27003 | | E29013 | 2 | A30007 | | JE31003 | 1 |
| A27003 | | A28003 | 1 | A30008 | | A30006 | 1 |
| A27004 | | B25003 | 2 | A30008 | | A30010 | 2 |
| A27004 | | A22003 | 1 | A30009 | | JE31026 | 1 |
| A27005 | | A27008 | 1 | A30010 | | A30008 | 2 |
| A27006 | | B13012 | 1 | A30011 | | B13004 | 1 |
| A27007 | | B27012 | 1 | A30012 | | B14011 | 1 |
| A27008 | | A27005 | 1 | A30013 | | A29013 | 1 |
| A27009 | | JE31043 | 1 | A30015 | | A26004 | 1 |
| A27010 | | B14004 | 1 | R01002 | | B01003 | 2 |
| A27011 | | B20004 | 1 | R01002 | | JF31022 | 1 |
| A27012 | | C14007 | 1 | R01003 | | B14015 | 1 |
| A27013 | | E29014 | 2 | R01003 | | B01002 | 2 |
| A27013 | | A28013 | 1 | R01004 | | B01005 | 1 |
| A27015 | | B30006 | 1 | R01004 | | B02011 | 2 |
| A28001 | | B30005 | 1 | R01005 | | B01011 | 2 |
| A28003 | | A27003 | 1 | R01005 | | B01004 | 1 |
| A28003 | | A29003 | 2 | R01006 | | B01007 | 2 |
| A28004 | | A28008 | 1 | R01006 | | JF31020 | 1 |
| A28005 | | B20012 | 1 | R01007 | | B14001 | 1 |
| A28006 | | B14012 | 1 | R01007 | | B01006 | 2 |
| A28007 | | JE31041 | 1 | R01009 | | JB31013 | 1 |
| A28008 | | A28004 | 1 | R01010 | | JB31036 | 1 |
| A28008 | | A28010 | 2 | R01011 | | B06011 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 6 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B01011 | | B01005 | 2 | B04002 | | JF31017 | 1 |
| B01012 | | B06012 | 1 | B04003 | | B11015 | 1 |
| B01012 | | B02012 | 2 | B04003 | | B04002 | 2 |
| B01013 | | JB31035 | 1 | B04004 | | B04005 | 2 |
| B01014 | | JB31012 | 1 | B04004 | | B05011 | 1 |
| B01015 | | B01016 | 1 | B04005 | | B04011 | 1 |
| B01016 | | B01015 | 1 | B04005 | | B04004 | 2 |
| B02002 | | B02003 | 2 | B04006 | | B04007 | 2 |
| B02002 | | JF31023 | 1 | B04006 | | JF31015 | 1 |
| B02003 | | B13015 | 1 | B04007 | | B11001 | 1 |
| B02003 | | B02002 | 2 | B04007 | | B04006 | 2 |
| B02004 | | B02005 | 2 | B04009 | | JB31020 | 1 |
| B02004 | | B03011 | 1 | B04010 | | JB31043 | 1 |
| B02005 | | B02011 | 1 | B04011 | | B03004 | 2 |
| B02005 | | B02004 | 2 | B04011 | | B04005 | 1 |
| B02006 | | B02007 | 2 | B04012 | | B03012 | 2 |
| B02006 | | JF31019 | 1 | B04012 | | B05012 | 1 |
| B02007 | | B13001 | 1 | B04013 | | JB31042 | 1 |
| B02007 | | B02006 | 2 | B04014 | | JB31019 | 1 |
| B02009 | | JB31015 | 1 | B04015 | | B04016 | 1 |
| B02010 | | JB31038 | 1 | B04016 | | B04015 | 1 |
| B02011 | | B01004 | 2 | B05002 | | B05003 | 2 |
| B02011 | | B02005 | 1 | B05002 | | JF31014 | 1 |
| B02012 | | B01012 | 2 | B05003 | | B20015 | 1 |
| B02012 | | B03012 | 1 | B05003 | | B05002 | 2 |
| B02013 | | JB31037 | 1 | B05004 | | B05005 | 1 |
| B02014 | | JB31014 | 1 | B05005 | | B05011 | 2 |
| B02015 | | B02016 | 1 | B05005 | | B05004 | 1 |
| B02016 | | B02015 | 1 | B05006 | | B05007 | 2 |
| B03002 | | B03003 | 2 | B05006 | | JF31005 | 1 |
| B03002 | | JF31012 | 1 | B05007 | | H20001 | 1 |
| B03003 | | B12015 | 1 | B05007 | | B05006 | 2 |
| B03003 | | B03002 | 2 | B05009 | | JB31022 | 1 |
| B03004 | | B03005 | 1 | B05010 | | JB31045 | 1 |
| B03004 | | B04011 | 2 | B05011 | | B04004 | 1 |
| B03005 | | B03011 | 2 | B05011 | | B05005 | 2 |
| B03005 | | B03004 | 1 | B05012 | | B04012 | 1 |
| B03006 | | B03007 | 2 | B05012 | | JC31043 | 2 |
| B03006 | | JF31011 | 1 | B05013 | | JB31044 | 1 |
| B03007 | | B12001 | 1 | B05014 | | JB31021 | 1 |
| B03007 | | B03006 | 2 | B05015 | | B05016 | 1 |
| B03009 | | JB31018 | 1 | B05016 | | B05015 | 1 |
| B03010 | | JB31041 | 1 | B06002 | | C02005 | 1 |
| B03011 | | B02004 | 1 | B06002 | | B06003 | 2 |
| B03011 | | B03005 | 2 | B06003 | | B06002 | 2 |
| B03012 | | B02012 | 1 | B06003 | | F02002 | 1 |
| B03012 | | B04012 | 2 | B06004 | | B07011 | 2 |
| B03013 | | JB31040 | 1 | B06004 | | B06005 | 1 |
| B03014 | | JB31017 | 1 | B06005 | | B06004 | 1 |
| B03015 | | B03016 | 1 | B06005 | | B06011 | 2 |
| B03016 | | B03015 | 1 | B06006 | | B06007 | 2 |
| B04002 | | B04003 | 2 | B06006 | | JF31002 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 7 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| R06007 | B18004 | | 1 | B08014 | JB31002 | | 1 |
| R06007 | B06006 | | 2 | B08015 | B08016 | | 1 |
| R06009 | JA31003 | | 1 | B08016 | B08015 | | 1 |
| R06010 | JA31026 | | 1 | B09002 | JC31041 | | 1 |
| R06011 | B06005 | | 2 | B09002 | B09003 | | 2 |
| R06011 | B01011 | | 1 | B09003 | B09002 | | 2 |
| R06012 | B07012 | | 2 | B09003 | B13007 | | 1 |
| R06012 | B01012 | | 1 | B09004 | B10011 | | 1 |
| R06013 | JA31024 | | 1 | R09004 | B09005 | | 2 |
| R06014 | JA31001 | | 1 | R09005 | B09004 | | 2 |
| R06015 | B06016 | | 1 | R09005 | B09011 | | 1 |
| R06016 | B06015 | | 1 | R09006 | B09007 | | 2 |
| R07002 | E14010 | | 1 | R09006 | F03012 | | 1 |
| R07002 | B07003 | | 2 | R09007 | C20004 | | 1 |
| R07003 | B07002 | | 2 | R09007 | B09006 | | 2 |
| R07004 | B08011 | | 1 | R09009 | JA31004 | | 1 |
| R07004 | B07005 | | 2 | R09010 | JA31027 | | 1 |
| R07005 | B07004 | | 2 | R09011 | B09005 | | 1 |
| R07005 | B07011 | | 1 | R09011 | B08004 | | 2 |
| R07006 | JC31022 | | 1 | R09012 | B10012 | | 1 |
| R07006 | B07007 | | 2 | R09012 | B08012 | | 2 |
| R07007 | B07006 | | 2 | R09013 | JB31027 | | 1 |
| R07007 | F12011 | | 1 | R09014 | JB31004 | | 1 |
| R07009 | JB31001 | | 1 | R09015 | B09016 | | 1 |
| R07010 | JB31024 | | 1 | R09016 | B09015 | | 1 |
| R07011 | B07005 | | 1 | R10004 | B10005 | | 1 |
| R07011 | B06004 | | 2 | R10004 | B10011 | | 2 |
| R07012 | B08012 | | 1 | R10005 | B15004 | | 2 |
| R07012 | B06012 | | 2 | R10005 | B10004 | | 1 |
| R07013 | JB31034 | | 1 | R10006 | B10007 | | 1 |
| R07014 | JB31011 | | 1 | R10007 | C15010 | | 2 |
| R07015 | B07016 | | 1 | R10007 | B10006 | | 1 |
| R07016 | B07015 | | 1 | R10009 | JB31009 | | 1 |
| R08002 | JC31023 | | 1 | R10010 | JB31032 | | 1 |
| R08002 | B08003 | | 2 | R10011 | B10004 | | 2 |
| R08003 | B08002 | | 2 | R10011 | B09004 | | 1 |
| R08003 | B14007 | | 1 | R10012 | B15012 | | 2 |
| R08004 | B09011 | | 2 | R10012 | B09012 | | 1 |
| R08004 | B08005 | | 1 | R10013 | JA31029 | | 1 |
| R08005 | B08004 | | 1 | R10014 | JA31006 | | 1 |
| R08005 | B08011 | | 2 | R10015 | B10016 | | 1 |
| R08006 | JC31040 | | 1 | R10016 | B10015 | | 1 |
| R08006 | B08007 | | 2 | R11001 | B04007 | | 1 |
| R08007 | B08006 | | 2 | R11002 | F03004 | | 1 |
| R08007 | B13009 | | 1 | R11003 | B12003 | | 2 |
| R08009 | JB31003 | | 1 | R11004 | D09004 | | 2 |
| R08010 | JB31026 | | 1 | R11004 | A28011 | | 1 |
| R08011 | B08005 | | 2 | R11005 | B11007 | | 1 |
| R08011 | B07004 | | 1 | R11006 | C14009 | | 1 |
| R08012 | B09012 | | 2 | R11007 | B11005 | | 1 |
| R08012 | B07012 | | 1 | R11007 | B11008 | | 2 |
| R08013 | JB31025 | | 1 | R11008 | B11007 | | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 8 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B1100A | B1100A | | 1 | R13014 | F04006 | | 1 |
| R11009 | B1100A | | 1 | R13015 | B02003 | | 1 |
| B11009 | B11011 | | 2 | B14001 | B01007 | | 1 |
| R11010 | D03004 | | 1 | R14002 | F04004 | | 1 |
| B11010 | B21014 | | 2 | B14003 | B19003 | | 1 |
| B11011 | B11009 | | 2 | R14003 | B13003 | | 2 |
| B11012 | D09012 | | 2 | B14004 | D06004 | | 2 |
| R11012 | A29005 | | 1 | R14004 | A27010 | | 1 |
| R11013 | B12013 | | 2 | R14005 | D06005 | | 1 |
| R11013 | C06004 | | 1 | R14005 | A30004 | | 2 |
| R11014 | F03002 | | 1 | R14006 | C18010 | | 2 |
| R11015 | B04003 | | 1 | R14006 | B25010 | | 1 |
| R12001 | B03007 | | 1 | R14007 | B08003 | | 1 |
| R12002 | F04014 | | 1 | R14009 | F12009 | | 1 |
| R12003 | B13003 | | 1 | R14010 | A21012 | | 2 |
| B12003 | B11003 | | 2 | R14010 | JF31025 | | 1 |
| R12004 | D08004 | | 2 | R14011 | D15014 | | 2 |
| R12004 | A29011 | | 1 | R14011 | A30012 | | 1 |
| R12005 | B12007 | | 1 | B14012 | D06012 | | 2 |
| R12006 | B27007 | | 1 | B14012 | A28006 | | 1 |
| R12007 | B12005 | | 1 | R14013 | B19013 | | 1 |
| R12007 | B1200A | | 2 | R14013 | B13013 | | 2 |
| R1200A | B12007 | | 2 | R14014 | F04002 | | 1 |
| R1200A | B12009 | | 1 | R14015 | B01003 | | 1 |
| R12009 | B1200A | | 1 | R15002 | C10010 | | 1 |
| R12010 | B16014 | | 1 | R15002 | B15003 | | 2 |
| R12011 | D08011 | | 2 | R15003 | B15002 | | 2 |
| R12011 | A28012 | | 1 | R15003 | JF31029 | | 1 |
| R12012 | D08012 | | 2 | R15004 | B15005 | | 1 |
| R12012 | A30005 | | 1 | R15004 | B10005 | | 2 |
| R12013 | B13013 | | 1 | R15005 | B15011 | | 2 |
| R12013 | B11013 | | 2 | R15005 | B15004 | | 1 |
| R12014 | F04012 | | 1 | R15006 | A22002 | | 2 |
| R12015 | B03003 | | 1 | R15006 | B15007 | | 1 |
| R13001 | B02007 | | 1 | R15007 | B15006 | | 1 |
| R13002 | F04010 | | 1 | R15007 | JF31010 | | 2 |
| R13003 | B14003 | | 2 | R15009 | JA31036 | | 1 |
| B13003 | B12003 | | 1 | R15010 | JA31014 | | 1 |
| R13004 | D07004 | | 2 | R15011 | C15014 | | 1 |
| R13004 | A30011 | | 1 | R15011 | B15005 | | 2 |
| R13005 | D07005 | | 2 | R15012 | A11014 | | 1 |
| R13005 | A29004 | | 1 | R15012 | B10012 | | 2 |
| R13006 | F24012 | | 1 | R15013 | JA31035 | | 1 |
| R13007 | B09003 | | 1 | R15014 | JA31012 | | 1 |
| R13009 | B08007 | | 1 | R15015 | B15016 | | 1 |
| R13010 | F23004 | | 1 | R15016 | B15015 | | 1 |
| R13011 | D07011 | | 1 | R16002 | C02010 | | 1 |
| R13011 | A29012 | | 2 | R16002 | C14003 | | 2 |
| R13012 | D07012 | | 2 | R16003 | E16003 | | 1 |
| R13012 | A27006 | | 1 | R16003 | F28003 | | 2 |
| R13013 | B14013 | | 2 | R16004 | C03002 | | 2 |
| R13013 | B12013 | | 1 | R16005 | C16002 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 9 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| B16006 | | F19006 | 2 | B20003 | | F30012 | 1 |
| B16006 | | F17010 | 1 | B20003 | | B19003 | 2 |
| B16007 | | E20010 | 1 | B20004 | | D10004 | 2 |
| B16009 | | E30004 | 1 | B20004 | | A27011 | 1 |
| B16010 | | E26014 | 1 | B20005 | | B20007 | 1 |
| B16011 | | E26013 | 1 | B20006 | | A24004 | 1 |
| B16012 | | E20014 | 2 | B20007 | | B20005 | 1 |
| B16013 | | B17010 | 1 | B20007 | | B20008 | 2 |
| B16014 | | E20002 | 2 | B20008 | | B20007 | 2 |
| B16014 | | B12010 | 1 | B20008 | | B20009 | 1 |
| B16015 | | B16016 | 1 | B20009 | | B20008 | 1 |
| B16016 | | B16015 | 1 | B20009 | | B20011 | 2 |
| B17002 | | C13013 | 2 | B20010 | | C14012 | 1 |
| B17002 | | C20010 | 1 | B20011 | | B20009 | 2 |
| B17003 | | C19014 | 2 | B20012 | | D10012 | 2 |
| B17003 | | F20012 | 1 | B20012 | | A28005 | 1 |
| B17005 | | C12004 | 1 | B20013 | | F30007 | 1 |
| B17006 | | C12007 | 1 | B20013 | | B19013 | 2 |
| B17007 | | B18002 | 1 | B20014 | | F03006 | 1 |
| B17009 | | B18006 | 1 | B20015 | | B05003 | 1 |
| B17010 | | B16013 | 1 | B21002 | | JC31020 | 1 |
| B17011 | | D25013 | 1 | B21002 | | C05003 | 2 |
| B17013 | | C14014 | 1 | B21003 | | A24014 | 1 |
| B17013 | | JD31020 | 2 | B21004 | | JC31012 | 1 |
| B17014 | | C18011 | 1 | B21005 | | C18012 | 2 |
| B17014 | | JD31021 | 2 | B21005 | | A21012 | 1 |
| B17015 | | B17016 | 1 | B21006 | | JD31022 | 1 |
| B17016 | | B17015 | 1 | B21007 | | A23011 | 1 |
| B18002 | | B17007 | 1 | B21009 | | D04013 | 1 |
| B18002 | | D25002 | 2 | B21010 | | JD31044 | 1 |
| B18003 | | E16002 | 2 | B21011 | | JD31043 | 1 |
| B18004 | | B06007 | 1 | B21012 | | D13012 | 1 |
| B18005 | | A16007 | 1 | B21013 | | C11001 | 2 |
| B18005 | | C20002 | 2 | B21014 | | B11010 | 2 |
| B18006 | | B17009 | 1 | B21015 | | B21016 | 1 |
| B18006 | | C20003 | 2 | B21016 | | B21015 | 1 |
| B18007 | | F30013 | 1 | B22002 | | D15005 | 2 |
| B18009 | | C07004 | 1 | B22003 | | B23009 | 1 |
| B18010 | | C20007 | 1 | B22004 | | B23007 | 1 |
| B18011 | | A19013 | 2 | B22004 | | A17009 | 2 |
| B18011 | | F01003 | 1 | B22005 | | B24009 | 1 |
| B18012 | | A26010 | 1 | B22006 | | B23003 | 1 |
| B18013 | | JF31009 | 2 | B22010 | | C27004 | 1 |
| B18014 | | B26012 | 1 | B22011 | | C23011 | 1 |
| B18015 | | B18016 | 1 | B22011 | | B23014 | 2 |
| B18016 | | B18015 | 1 | B22012 | | F10012 | 1 |
| B19003 | | B20003 | 2 | B22013 | | C22003 | 2 |
| B19003 | | B14003 | 1 | B22013 | | D25004 | 1 |
| B19013 | | B20013 | 2 | B22014 | | C04004 | 1 |
| B19013 | | B14013 | 1 | B22014 | | C28014 | 2 |
| B20001 | | B05007 | 1 | B22015 | | B22016 | 1 |
| B20002 | | F03010 | 1 | B22016 | | B22015 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 10 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| R23002 | B28007 | | 1 | B25015 | A21002 | | 2 |
| R23002 | B25011 | | 2 | R26002 | JC31024 | | 1 |
| R23003 | D15006 | | 2 | R26002 | C25006 | | 2 |
| R23003 | B22006 | | 1 | B26003 | C25011 | | 1 |
| R23004 | B24011 | | 2 | R26003 | F13002 | | 2 |
| R23004 | JF3101A | | 1 | B26004 | C27003 | | 1 |
| R23005 | C01011 | | 2 | B26005 | A19010 | | 2 |
| R23005 | B24005 | | 1 | B26005 | JF31007 | | 1 |
| R23007 | B22004 | | 1 | R26006 | C06011 | | 1 |
| R23008 | B23013 | | 1 | R26006 | F15010 | | 2 |
| R23009 | B22003 | | 1 | R26007 | C27014 | | 1 |
| R23011 | B24012 | | 1 | R26009 | B27011 | | 1 |
| R23012 | B24006 | | 2 | B26010 | B29014 | | 1 |
| B23013 | B23008 | | 1 | R26011 | C28010 | | 1 |
| R23014 | B22011 | | 2 | B26012 | B18014 | | 1 |
| R23014 | B28009 | | 1 | B26013 | D29012 | | 1 |
| R23015 | B23016 | | 1 | B26014 | F20003 | | 1 |
| B23016 | B23015 | | 1 | R26015 | B26016 | | 1 |
| R24002 | F09013 | | 2 | B26016 | B26015 | | 1 |
| R24003 | A22004 | | 1 | R27002 | B27010 | | 1 |
| R24004 | C30005 | | 1 | R27002 | E29006 | | 2 |
| R24005 | B23005 | | 1 | R27003 | C27010 | | 1 |
| R24006 | A19001 | | 1 | R27004 | F10010 | | 1 |
| R24006 | B23012 | | 2 | B27005 | C27009 | | 1 |
| R24007 | A16014 | | 1 | B27006 | C27007 | | 1 |
| R24009 | B22005 | | 1 | R27007 | B12006 | | 1 |
| R24010 | A17015 | | 1 | R27009 | D18006 | | 1 |
| R24010 | B24013 | | 2 | R27010 | C30013 | | 2 |
| R24011 | A16011 | | 1 | R27010 | B27002 | | 1 |
| R24011 | B23004 | | 2 | R27011 | B26009 | | 1 |
| R24012 | B23011 | | 1 | R27012 | A27007 | | 1 |
| R24013 | B24010 | | 2 | R27013 | E28009 | | 1 |
| R24014 | C01005 | | 1 | R27013 | A25005 | | 2 |
| R24014 | F01002 | | 2 | R27014 | D17011 | | 1 |
| R24015 | B24016 | | 1 | R27015 | H27016 | | 1 |
| R24016 | B24015 | | 1 | R27016 | B27015 | | 1 |
| R25001 | B25008 | | 1 | B28001 | B28008 | | 1 |
| R25002 | D20009 | | 1 | R28002 | H29007 | | 1 |
| R25003 | B25011 | | 1 | B28003 | B30007 | | 2 |
| R25003 | A27004 | | 2 | B28004 | B30006 | | 2 |
| R25004 | E17002 | | 1 | B28005 | B30005 | | 2 |
| R25006 | A21013 | | 1 | B28006 | B30004 | | 2 |
| R25007 | A21004 | | 2 | R28007 | B28009 | | 2 |
| R25008 | B25001 | | 1 | R28007 | B23002 | | 1 |
| R25009 | A14010 | | 2 | R28008 | B28001 | | 1 |
| R25009 | F24002 | | 1 | R28009 | B23014 | | 1 |
| R25010 | B14006 | | 1 | R28009 | B28007 | | 2 |
| R25010 | E28002 | | 2 | R28010 | B30015 | | 1 |
| R25011 | B23002 | | 2 | R28010 | D07009 | | 2 |
| R25011 | B25003 | | 1 | R28011 | B30014 | | 1 |
| R25012 | C30012 | | 1 | R28011 | D07007 | | 2 |
| R25014 | A21015 | | 1 | R28012 | B30013 | | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 11 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| R28012 | | D08009 | 2 | C01011 | | C01007 | 1 |
| R28013 | | B30012 | 1 | C01011 | | B23005 | 2 |
| R28013 | | C10013 | 2 | C01012 | | C09004 | 1 |
| R28015 | | B29009 | 1 | C01013 | | D19002 | 2 |
| R29001 | | B29008 | 1 | C01013 | | C04003 | 1 |
| R29003 | | A26007 | 2 | C01014 | | C01009 | 1 |
| R29004 | | A26006 | 2 | C01014 | | C02003 | 2 |
| R29005 | | A26005 | 2 | C01015 | | C01016 | 1 |
| R29006 | | A26004 | 2 | C01016 | | C01015 | 1 |
| R29007 | | B28002 | 1 | C02002 | | C09010 | 1 |
| R29008 | | B29001 | 1 | C02003 | | C01014 | 2 |
| R29009 | | B28015 | 1 | C02003 | | C04002 | 1 |
| R29010 | | A26015 | 1 | C02004 | | D16011 | 1 |
| R29011 | | A26014 | 1 | C02004 | | C10002 | 2 |
| R29012 | | A26013 | 1 | C02005 | | JF31003 | 2 |
| R29012 | | D06009 | 2 | C02005 | | B06002 | 1 |
| R29013 | | B30003 | 1 | C02006 | | JC31003 | 1 |
| R29013 | | D06007 | 2 | C02006 | | C20013 | 2 |
| R29014 | | B26010 | 1 | C02007 | | C08005 | 1 |
| R30001 | | F27001 | 2 | C02009 | | F15002 | 1 |
| R30001 | | A26001 | 1 | C02010 | | D13014 | 2 |
| R30002 | | A26012 | 1 | C02010 | | B16002 | 1 |
| R30002 | | B30003 | 2 | C02011 | | C08007 | 1 |
| R30003 | | B30002 | 2 | C02012 | | C14006 | 1 |
| R30003 | | B29013 | 1 | C02013 | | JF31023 | 1 |
| R30004 | | A28015 | 1 | C02013 | | C03010 | 2 |
| R30004 | | B28006 | 2 | C02014 | | J031015 | 1 |
| R30005 | | A28001 | 1 | C02015 | | C02016 | 1 |
| R30005 | | B28005 | 2 | C02016 | | C02015 | 1 |
| R30006 | | A27015 | 1 | C03002 | | E20007 | 1 |
| R30006 | | B28004 | 2 | C03002 | | B16004 | 2 |
| R30007 | | A27001 | 1 | C03003 | | C19003 | 1 |
| R30007 | | B28003 | 2 | C03004 | | C19002 | 1 |
| R30009 | | F15007 | 1 | C03005 | | F14003 | 1 |
| R30009 | | A26009 | 2 | C03005 | | C04010 | 2 |
| R30010 | | A26010 | 2 | C03006 | | JC31002 | 1 |
| R30010 | | C28004 | 1 | C03007 | | C04014 | 1 |
| R30012 | | B28013 | 1 | C03009 | | E07002 | 1 |
| R30013 | | B28012 | 1 | C03010 | | C02013 | 2 |
| R30014 | | B28011 | 1 | C03011 | | E16011 | 1 |
| R30015 | | B28010 | 1 | C03012 | | C06002 | 1 |
| C01002 | | C15015 | 1 | C03013 | | C08004 | 1 |
| C01002 | | A11009 | 2 | C03013 | | C19005 | 2 |
| C01003 | | D05001 | 2 | C03014 | | F15006 | 1 |
| C01003 | | C01006 | 1 | C03014 | | C24014 | 2 |
| C01004 | | D18004 | 1 | C03015 | | C03016 | 1 |
| C01005 | | A19009 | 2 | C03016 | | C03015 | 1 |
| C01005 | | B24014 | 1 | C04002 | | C02003 | 1 |
| C01006 | | C01003 | 1 | C04002 | | C13014 | 2 |
| C01007 | | C01011 | 1 | C04003 | | C01013 | 1 |
| C01009 | | C01014 | 1 | C04004 | | B22014 | 1 |
| C01010 | | D05004 | 1 | C04005 | | C06013 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 12 | REV. A |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C04006 | | C09013 | 2 | C07006 | | F24014 | 1 |
| C04007 | | C06006 | 1 | C07007 | | F23003 | 1 |
| C04009 | | E12014 | 1 | C07010 | | F09011 | 1 |
| C04010 | | C03005 | 2 | C07011 | | C15013 | 1 |
| C04011 | | C09006 | 1 | C07011 | | C07005 | 2 |
| C04011 | | D12010 | 2 | C07012 | | C07004 | 2 |
| C04012 | | E12004 | 1 | C07012 | | F14004 | 1 |
| C04013 | | C09003 | 2 | C07013 | | F24011 | 2 |
| C04013 | | C19014 | 1 | C07013 | | D12011 | 1 |
| C04014 | | C03007 | 1 | C07014 | | D20010 | 2 |
| C04014 | | F05005 | 2 | C07015 | | C07016 | 1 |
| C04015 | | C04016 | 1 | C07016 | | C07015 | 1 |
| C04016 | | C04015 | 1 | C08002 | | C06012 | 2 |
| C05002 | JC31021 | | 1 | C08002 | | D2003 | 1 |
| C05003 | B21002 | | 2 | C08003 | | C08008 | 1 |
| C05004 | F19012 | | 1 | C08004 | | C10006 | 2 |
| C05005 | D13002 | | 1 | C08004 | | C03013 | 1 |
| C05006 | E02001 | | 1 | C08005 | | C02007 | 1 |
| C05007 | F03004 | | 1 | C08006 | | C13010 | 2 |
| C05008 | C31046 | | 2 | C08006 | | C13011 | 1 |
| C05009 | D25005 | | 1 | C08007 | | C02011 | 1 |
| C05010 | D14006 | | 2 | C08008 | | C08003 | 1 |
| C05011 | C24003 | | 2 | C08010 | | C09012 | 1 |
| C05012 | C18004 | | 1 | C08011 | | D03012 | 1 |
| C05013 | A14007 | | 1 | C08012 | | C06009 | 1 |
| C05014 | A19011 | | 2 | C08013 | | C14004 | 1 |
| C05015 | C05016 | | 1 | C08014 | | F15009 | 1 |
| C05016 | C05015 | | 1 | C08015 | | C08016 | 1 |
| C06002 | C03012 | | 1 | C08016 | | C08015 | 1 |
| C06002 | C17003 | | 2 | C09002 | | F05007 | 1 |
| C06003 | C16014 | | 1 | C09003 | | C09007 | 1 |
| C06004 | B11013 | | 1 | C09003 | | C04013 | 2 |
| C06005 | C11003 | | 1 | C09004 | | C01012 | 1 |
| C06006 | C04007 | | 1 | C09004 | | D14012 | 2 |
| C06007 | F05013 | | 1 | C09005 | | C22011 | 1 |
| C06009 | C08012 | | 1 | C09005 | | E26003 | 2 |
| C06010 | C13007 | | 1 | C09006 | | C04011 | 1 |
| C06011 | B26006 | | 1 | C09007 | | C09003 | 1 |
| C06012 | JD31045 | | 1 | C09009 | | C12005 | 1 |
| C06012 | C08002 | | 2 | C09009 | | C10003 | 1 |
| C06013 | C04005 | | 1 | C09010 | | C02002 | 1 |
| C06014 | D25006 | | 1 | C09011 | | C16007 | 1 |
| C06015 | C06016 | | 1 | C09012 | | C08010 | 1 |
| C06016 | C06015 | | 1 | C09012 | | E19003 | 2 |
| C07002 | C07005 | | 1 | C09013 | | D17007 | 1 |
| C07002 | C09014 | | 2 | C09013 | | C04006 | 2 |
| C07003 | JD31033 | | 1 | C09014 | | C07002 | 2 |
| C07003 | F09005 | | 2 | C09014 | | C10011 | 1 |
| C07004 | B18009 | | 1 | C09015 | | C09016 | 1 |
| C07004 | C07012 | | 2 | C09016 | | C09015 | 1 |
| C07005 | C07011 | | 2 | C10002 | | C02004 | 2 |
| C07005 | C07002 | | 1 | C10002 | | C10005 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 13 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C10002 | | C21005 | 2 | C12005 | | C10003 | 2 |
| C10003 | | C11012 | 2 | C12006 | | E14006 | 1 |
| C10003 | | C09009 | 1 | C12006 | | C12002 | 2 |
| C10003 | | C12005 | 2 | C12007 | | B17006 | 1 |
| C10004 | | D16009 | 1 | C12015 | | C12016 | 1 |
| C10005 | | C10011 | 2 | C12016 | | C12015 | 1 |
| C10005 | | C10011 | 2 | C13002 | | C18014 | 1 |
| C10005 | | C10007 | 1 | C13002 | | F05014 | 2 |
| C10006 | | C08004 | 2 | C13003 | | C14005 | 2 |
| C10007 | | C13006 | 1 | C13003 | | D18010 | 1 |
| C10009 | | F02004 | 1 | C13005 | | E16014 | 2 |
| C10010 | | B15007 | 1 | C13006 | | C10007 | 1 |
| C10011 | | C09014 | 1 | C13006 | | E13013 | 2 |
| C10011 | | C10005 | 2 | C13007 | | C06010 | 1 |
| C10011 | | C10005 | 2 | C13009 | | D16010 | 1 |
| C10012 | | C23012 | 1 | C13010 | | C11012 | 2 |
| C10012 | | E26002 | 2 | C13010 | | C08006 | 2 |
| C10013 | | B28013 | 2 | C13011 | | C08006 | 1 |
| C10013 | | D08007 | 1 | C13011 | | C14002 | 2 |
| C10014 | | C19009 | 1 | C13013 | | C13014 | 1 |
| C10015 | | C10016 | 1 | C13013 | | B17002 | 2 |
| C10016 | | C10015 | 1 | C13014 | | C04002 | 2 |
| C11001 | | C11004 | 1 | C13014 | | C13013 | 1 |
| C11001 | | B21013 | 2 | C13015 | | C13016 | 1 |
| C11002 | | C11006 | 2 | C13016 | | C13015 | 1 |
| C11003 | | C06005 | 1 | C14002 | | C13011 | 2 |
| C11004 | | E06014 | 2 | C14003 | | B16002 | 2 |
| C11004 | | C11001 | 1 | C14003 | | E13014 | 1 |
| C11005 | | F19007 | 1 | C14004 | | C08013 | 1 |
| C11005 | | C18014 | 2 | C14005 | | JC31009 | 1 |
| C11006 | | C11008 | 1 | C14005 | | C13003 | 2 |
| C11006 | | C11007 | 2 | C14006 | | C02012 | 1 |
| C11007 | | C11016 | 1 | C14007 | | A27012 | 1 |
| C11008 | | C11006 | 1 | C14009 | | B11006 | 1 |
| C11008 | | C11013 | 2 | C14010 | | C18009 | 1 |
| C11009 | | D12014 | 2 | C14010 | | C14014 | 2 |
| C11009 | | C11010 | 1 | C14011 | | JD31014 | 1 |
| C11010 | | C11009 | 1 | C14012 | | B20010 | 1 |
| C11011 | | C11012 | 1 | C14013 | | JD31011 | 1 |
| C11012 | | C11011 | 1 | C14014 | | C14010 | 2 |
| C11012 | | C13010 | 2 | C14014 | | B17013 | 1 |
| C11012 | | C10003 | 2 | C14015 | | C14016 | 1 |
| C11013 | | C11008 | 2 | C14016 | | C14015 | 1 |
| C11014 | | C11015 | 1 | C15001 | | E14011 | 2 |
| C11015 | | C11014 | 1 | C15006 | | F21011 | 1 |
| C11015 | | D20011 | 2 | C15007 | | A17006 | 2 |
| C11016 | | C11007 | 1 | C15010 | | C22005 | 1 |
| C12002 | | C12006 | 2 | C15010 | | B10007 | 2 |
| C12003 | | C19005 | 1 | C15011 | | E11005 | 1 |
| C12003 | | C21003 | 2 | C15012 | | C30003 | 1 |
| C12004 | | B17005 | 1 | C15013 | | C07011 | 1 |
| C12005 | | C09009 | 1 | C15013 | | C21005 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 14 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C15014 | B15011 | | 1 | C19002 | C03004 | | 1 |
| C15015 | C01002 | | 1 | C19003 | F20010 | | 2 |
| C15015 | C20005 | | 2 | C19003 | C03003 | | 1 |
| C16002 | F30009 | | 2 | C19004 | D15011 | | 1 |
| C16002 | B16005 | | 1 | C19005 | C03013 | | 2 |
| C16003 | D13010 | | 2 | C19005 | C12003 | | 1 |
| C16003 | C16004 | | 1 | C19006 | C26009 | | 1 |
| C16004 | C16003 | | 1 | C19007 | D23014 | | 1 |
| C16005 | D16007 | | 1 | C19009 | C10014 | | 1 |
| C16006 | C19012 | | 1 | C19010 | C24002 | | 2 |
| C16007 | C09011 | | 1 | C19011 | C16014 | | 2 |
| C16009 | C23004 | | 1 | C19011 | C23005 | | 1 |
| C16010 | F13007 | | 1 | C19012 | C16006 | | 1 |
| C16011 | E29010 | | 2 | C19013 | D24009 | | 1 |
| C16014 | C06003 | | 1 | C19014 | C04013 | | 1 |
| C16014 | C19011 | | 2 | C19014 | B17003 | | 2 |
| C16015 | C16016 | | 1 | C19015 | C19016 | | 1 |
| C16016 | C16015 | | 1 | C19016 | C19015 | | 1 |
| C17002 | C21007 | | 1 | C20002 | B18005 | | 2 |
| C17002 | E12011 | | 2 | C20003 | B18006 | | 2 |
| C17003 | C06002 | | 2 | C20003 | A23007 | | 1 |
| C17004 | D17010 | | 1 | C20004 | B09007 | | 1 |
| C17005 | C21009 | | 1 | C20005 | C15015 | | 2 |
| C17006 | C17011 | | 2 | C20005 | F01015 | | 1 |
| C17007 | C18010 | | 1 | C20006 | A12005 | | 1 |
| C17009 | C30013 | | 1 | C20007 | B18010 | | 1 |
| C17010 | C22007 | | 1 | C20009 | C20014 | | 1 |
| C17011 | E15012 | | 1 | C20010 | B17002 | | 1 |
| C17011 | C17006 | | 2 | C20010 | D28005 | | 2 |
| C17012 | E03005 | | 1 | C20011 | D14010 | | 1 |
| C17013 | F24007 | | 1 | C20012 | F20011 | | 1 |
| C17014 | E20009 | | 1 | C20013 | C02006 | | 2 |
| C17015 | C17016 | | 1 | C20013 | D17006 | | 1 |
| C17016 | C17015 | | 1 | C20014 | C20009 | | 1 |
| C18002 | E30009 | | 1 | C20015 | C20016 | | 1 |
| C18003 | JE31034 | | 1 | C20016 | C20015 | | 1 |
| C18004 | C05012 | | 1 | C21002 | C22014 | | 2 |
| C18004 | D19004 | | 2 | C21003 | C12003 | | 2 |
| C18005 | JE31024 | | 1 | C21003 | D14013 | | 1 |
| C18006 | E30013 | | 1 | C21004 | C21012 | | 2 |
| C18007 | JE31029 | | 1 | C21004 | C22004 | | 1 |
| C18009 | C14010 | | 1 | C21005 | C10002 | | 2 |
| C18010 | C17007 | | 1 | C21005 | C15013 | | 2 |
| C18010 | B14006 | | 2 | C21005 | C21011 | | 1 |
| C18011 | B17014 | | 1 | C21006 | C21013 | | 1 |
| C18012 | B21005 | | 2 | C21007 | C17002 | | 1 |
| C18012 | D15004 | | 1 | C21009 | C17005 | | 1 |
| C18013 | JE31001 | | 1 | C21010 | C22003 | | 1 |
| C18014 | C11005 | | 2 | C21011 | C21005 | | 1 |
| C18014 | C13002 | | 1 | C21011 | C23011 | | 2 |
| C18015 | C18016 | | 1 | C21012 | D24007 | | 1 |
| C18016 | C18015 | | 1 | C21012 | C21004 | | 2 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 15 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C21013 | | C21006 | 1 | C24005 | | F23007 | 1 |
| C21013 | | C26004 | 2 | C24006 | | E16005 | 1 |
| C21014 | | D23012 | 1 | C24007 | | E05011 | 1 |
| C21014 | | C22002 | 2 | C24009 | | C25010 | 1 |
| C21015 | | C21016 | 1 | C24010 | | E15013 | 2 |
| C21016 | | C21015 | 1 | C24011 | | C22006 | 2 |
| C22002 | | C21014 | 2 | C24014 | | C03014 | 2 |
| C22003 | | C21010 | 1 | C24015 | | C24016 | 1 |
| C22003 | | B22013 | 2 | C24016 | | C24015 | 1 |
| C22004 | | C21004 | 1 | C25004 | | D24004 | 1 |
| C22005 | | C15010 | 1 | C25005 | | D24005 | 1 |
| C22005 | | C22011 | 2 | C25006 | | B26002 | 2 |
| C22006 | | C22013 | 1 | C25006 | | E12003 | 1 |
| C22006 | | C24011 | 2 | C25007 | | C26003 | 1 |
| C22007 | | C17010 | 1 | C25009 | | C23002 | 1 |
| C22010 | | C24002 | 1 | C25010 | | C24009 | 1 |
| C22011 | | C22005 | 2 | C25011 | | B26003 | 1 |
| C22011 | | C09005 | 1 | C25012 | | JC31037 | 1 |
| C22012 | | D24012 | 1 | C25013 | | A26002 | 1 |
| C22013 | | C22006 | 1 | C25014 | | A14005 | 1 |
| C22013 | | D24011 | 2 | C25015 | | C25016 | 1 |
| C22014 | | D23009 | 1 | C25016 | | C25015 | 1 |
| C22014 | | C21002 | 2 | C26002 | | F13009 | 1 |
| C22015 | | C22016 | 1 | C26003 | | C25007 | 1 |
| C22016 | | C22015 | 1 | C26003 | | F13003 | 2 |
| C23002 | | C25009 | 1 | C26004 | | C21013 | 2 |
| C23002 | | C23014 | 2 | C26005 | | C27011 | 1 |
| C23003 | | C23013 | 2 | C26005 | | C26014 | 2 |
| C23003 | | E26007 | 1 | C26007 | | D15003 | 1 |
| C23004 | | C16009 | 1 | C26008 | | C26013 | 1 |
| C23004 | | D29012 | 2 | C26009 | | C19006 | 1 |
| C23005 | | C19011 | 1 | C26010 | | E11002 | 1 |
| C23005 | | F18011 | 2 | C26011 | | D23002 | 2 |
| C23006 | | F19004 | 1 | C26012 | | F08007 | 1 |
| C23007 | | F15005 | 1 | C26012 | | A25005 | 2 |
| C23009 | | F20005 | 1 | C26013 | | C26008 | 1 |
| C23011 | | C21011 | 2 | C26014 | | C26005 | 2 |
| C23011 | | B22011 | 1 | C26014 | | D29002 | 1 |
| C23012 | | C28004 | 2 | C26015 | | C26016 | 1 |
| C23012 | | C10012 | 1 | C26016 | | C26015 | 1 |
| C23013 | | D29010 | 1 | C27002 | | D21013 | 1 |
| C23013 | | C23003 | 2 | C27003 | | B26004 | 1 |
| C23014 | | C23002 | 2 | C27004 | | B22010 | 1 |
| C23014 | | D29014 | 1 | C27005 | | C28013 | 1 |
| C23015 | | C23016 | 1 | C27005 | | C27011 | 2 |
| C23016 | | C23015 | 1 | C27007 | | B27006 | 1 |
| C24002 | | C22010 | 1 | C27009 | | B27005 | 1 |
| C24002 | | C19010 | 2 | C27010 | | B27003 | 1 |
| C24003 | | D18009 | 1 | C27011 | | C27005 | 2 |
| C24003 | | C05011 | 2 | C27011 | | C26005 | 1 |
| C24004 | | E16007 | 1 | C27012 | | E15009 | 1 |
| C24004 | | D15010 | 2 | C27013 | | F13004 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 16 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| C27014 | B26007 | | 1 | C30013 | B27010 | | 2 |
| C27015 | C27016 | | 1 | C30014 | C29005 | | 2 |
| C27016 | C27015 | | 1 | C30015 | C30016 | | 1 |
| C28002 | E15010 | | 2 | C30016 | C30015 | | 1 |
| C28002 | A25011 | | 1 | C31026 | C31027 | | 1 |
| C28003 | F25003 | | 1 | C31027 | C31026 | | 1 |
| C28004 | B30010 | | 1 | C31027 | C3102A | | 2 |
| C28004 | C23012 | | 2 | C3102A | C31027 | | 2 |
| C28005 | C30011 | | 2 | C3102A | C31030 | | 1 |
| C28005 | C28012 | | 1 | C31030 | C3102A | | 1 |
| C28007 | C28011 | | 1 | C31030 | C3103A | | 2 |
| C28010 | B26011 | | 1 | C3103A | C31030 | | 2 |
| C28011 | C28007 | | 1 | C3103A | C31046 | | 1 |
| C28012 | C28005 | | 1 | C31046 | C3103A | | 1 |
| C28012 | C28013 | | 2 | C31046 | C0500A | | 2 |
| C28013 | C28012 | | 2 | D01002 | D06015 | | 1 |
| C28013 | C27005 | | 1 | D01003 | JE31025 | | 1 |
| C28014 | B22014 | | 2 | D01004 | D06001 | | 1 |
| C28014 | E24009 | | 1 | D01005 | JE31002 | | 1 |
| C28015 | C28016 | | 1 | D01006 | D07015 | | 1 |
| C28016 | C28015 | | 1 | D01007 | JE31006 | | 1 |
| C29002 | C30009 | | 1 | D01009 | JE31009 | | 1 |
| C29003 | C29013 | | 2 | D01010 | D07001 | | 1 |
| C29004 | A25007 | | 1 | D01011 | JE31013 | | 1 |
| C29005 | D28007 | | 1 | D01012 | D08015 | | 1 |
| C29005 | C30014 | | 2 | D01013 | JE31040 | | 1 |
| C29006 | D27003 | | 1 | D01014 | D08001 | | 1 |
| C29007 | D27013 | | 1 | D01015 | D01016 | | 1 |
| C29009 | D27014 | | 1 | D01016 | D01015 | | 1 |
| C29010 | D27006 | | 1 | D02002 | D09015 | | 1 |
| C29011 | D28009 | | 1 | D02003 | JE31042 | | 1 |
| C29011 | F05010 | | 2 | D02004 | D09001 | | 1 |
| C29012 | A25009 | | 1 | D02005 | JE31022 | | 1 |
| C29013 | D18013 | | 1 | D02006 | D10015 | | 1 |
| C29013 | C29003 | | 2 | D02007 | JD31025 | | 1 |
| C29014 | F10009 | | 1 | D02008 | D31030 | | 1 |
| C29015 | C29016 | | 1 | D02009 | JD31003 | | 1 |
| C29016 | C29015 | | 1 | D02010 | D10001 | | 1 |
| C30002 | F29014 | | 1 | D02011 | JD31004 | | 1 |
| C30002 | A25002 | | 2 | D02012 | D11015 | | 1 |
| C30003 | C15012 | | 1 | D02014 | D11001 | | 1 |
| C30003 | C30004 | | 2 | D02015 | D02016 | | 1 |
| C30004 | C30003 | | 2 | D02016 | D02015 | | 1 |
| C30004 | C30011 | | 1 | D03001 | D0300A | | 1 |
| C30005 | B24004 | | 1 | D03002 | D03003 | | 2 |
| C30006 | D26002 | | 1 | D03002 | E02006 | | 1 |
| C30007 | D19014 | | 1 | D03003 | D03010 | | 1 |
| C30009 | C29002 | | 1 | D03003 | D03002 | | 2 |
| C30011 | C30004 | | 1 | D03004 | B11010 | | 1 |
| C30011 | C28005 | | 2 | D03005 | F08012 | | 1 |
| C30012 | B25012 | | 1 | D03006 | D04015 | | 1 |
| C30013 | C17009 | | 1 | D03007 | D04002 | | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 17 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D03008 | | D03001 | 1 | D06003 | | D07003 | 1 |
| D03009 | | A24005 | 1 | D06004 | | E08013 | 1 |
| D03010 | | D05003 | 2 | D06004 | | B14004 | 2 |
| D03010 | | D03003 | 1 | D06005 | | E13003 | 2 |
| D03011 | | D14002 | 1 | D06005 | | B14005 | 1 |
| D03012 | | C08011 | 1 | D06006 | | D21010 | 2 |
| D03013 | | D12013 | 1 | D06007 | | H29013 | 2 |
| D03013 | | D13013 | 2 | D06009 | | B29012 | 2 |
| D03014 | | D04013 | 2 | D06010 | | E23014 | 1 |
| D03015 | | D04004 | 2 | D06011 | | E07007 | 2 |
| D04001 | | D04002 | 1 | D06011 | | D15014 | 1 |
| D04002 | | D04001 | 1 | D06012 | | E08012 | 1 |
| D04002 | | D03007 | 2 | D06012 | | B14012 | 2 |
| D04003 | | D04004 | 1 | D06013 | | D11013 | 2 |
| D04004 | | D04003 | 1 | D06013 | | D07013 | 1 |
| D04004 | | D03015 | 2 | D06015 | | D01002 | 1 |
| D04005 | | D04006 | 1 | D07001 | | D01010 | 1 |
| D04005 | | D05007 | 2 | D07003 | | D06003 | 1 |
| D04006 | | D04005 | 1 | D07003 | | D08003 | 2 |
| D04007 | | D04008 | 1 | D07004 | | E08015 | 1 |
| D04008 | | D04007 | 1 | D07004 | | B13004 | 2 |
| D04008 | | D05015 | 2 | D07005 | | E06009 | 1 |
| D04009 | | D05014 | 1 | D07005 | | B13005 | 2 |
| D04010 | | D04012 | 1 | D07006 | | E23011 | 1 |
| D04011 | | D05006 | 1 | D07007 | | H28011 | 2 |
| D04012 | | D04010 | 1 | D07007 | | F20002 | 1 |
| D04012 | | D04014 | 2 | D07009 | | B28010 | 2 |
| D04013 | | B21009 | 1 | D07010 | | D21006 | 2 |
| D04013 | | D03014 | 2 | D07011 | | E13005 | 2 |
| D04014 | | D04012 | 2 | D07011 | | B13011 | 1 |
| D04014 | | D04016 | 1 | D07012 | | E08014 | 1 |
| D04015 | | D03006 | 1 | D07012 | | B13012 | 2 |
| D04016 | | D04014 | 1 | D07013 | | D06013 | 1 |
| D05001 | | F25009 | 1 | D07013 | | D08013 | 2 |
| D05001 | | C01003 | 2 | D07015 | | D01006 | 1 |
| D05002 | | E21012 | 1 | D08001 | | D01014 | 1 |
| D05003 | | D05011 | 1 | D08003 | | D07003 | 2 |
| D05003 | | D03010 | 2 | D08003 | | D09003 | 1 |
| D05004 | | C01010 | 1 | D08004 | | E09013 | 1 |
| D05006 | | D04011 | 1 | D08004 | | B12004 | 2 |
| D05007 | | D04005 | 2 | D08005 | | D08008 | 1 |
| D05008 | | D05009 | 1 | D08006 | | F20004 | 2 |
| D05009 | | D05008 | 1 | D08007 | | C10013 | 1 |
| D05010 | | E11013 | 2 | D08007 | | E30002 | 2 |
| D05010 | | D25014 | 1 | D08008 | | D08005 | 1 |
| D05011 | | D14005 | 2 | D08009 | | H28012 | 2 |
| D05011 | | D05003 | 1 | D08009 | | F10006 | 1 |
| D05012 | | E11012 | 1 | D08010 | | D21004 | 2 |
| D05014 | | D04009 | 1 | D08011 | | E13002 | 1 |
| D05015 | | D04008 | 2 | D08011 | | B12011 | 2 |
| D06001 | | D01004 | 1 | D08012 | | E09012 | 1 |
| D06003 | | D11003 | 2 | D08012 | | B12012 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 18 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D08013 | | D07013 | 2 | D12005 | | D16004 | 1 |
| D08013 | | D09013 | 1 | D12005 | | D12003 | 2 |
| D08015 | | D01012 | 1 | D12006 | | JD31037 | 1 |
| D09001 | | D02004 | 1 | D12007 | | D11013 | 1 |
| D09003 | | D08003 | 1 | D12009 | | F05003 | 1 |
| D09003 | | D10003 | 2 | D12010 | | C04011 | 2 |
| D09004 | | E09015 | 1 | D12011 | | C07013 | 1 |
| D09004 | | B11004 | 2 | D12012 | | E05014 | 1 |
| D09005 | | F29010 | 1 | D12013 | | D03013 | 1 |
| D09006 | | E22011 | 1 | D12013 | | D20004 | 2 |
| D09007 | | F27014 | 1 | D12014 | | F28009 | 1 |
| D09009 | | F27015 | 1 | D12014 | | C11009 | 2 |
| D09010 | | D25010 | 2 | D12015 | | D12016 | 1 |
| D09011 | | F29007 | 2 | D12016 | | D12015 | 1 |
| D09012 | | E09014 | 1 | D13002 | | E16006 | 2 |
| D09012 | | B11012 | 2 | D13002 | | C05005 | 1 |
| D09013 | | D08013 | 1 | D13003 | | D20004 | 1 |
| D09013 | | D10013 | 2 | D13003 | | E19011 | 2 |
| D09015 | | D02002 | 1 | D13004 | | D13005 | 1 |
| D10001 | | D02010 | 1 | D13005 | | D13004 | 1 |
| D10003 | | D09003 | 2 | D13006 | | F30003 | 1 |
| D10004 | | E10013 | 1 | D13007 | | E10011 | 1 |
| D10004 | | B20004 | 2 | D13009 | | D14014 | 1 |
| D10005 | | F29013 | 1 | D13010 | | D19009 | 1 |
| D10006 | | D25012 | 2 | D13010 | | C16003 | 2 |
| D10007 | | D10008 | 1 | D13011 | | D20006 | 1 |
| D10008 | | D10007 | 1 | D13011 | | F29014 | 2 |
| D10008 | | D10009 | 2 | D13012 | | B21012 | 1 |
| D10009 | | D10008 | 2 | D13013 | | D03013 | 2 |
| D10010 | | D25011 | 2 | D13014 | | D14007 | 1 |
| D10011 | | F29003 | 1 | D13014 | | C02010 | 2 |
| D10012 | | E10012 | 1 | D13015 | | D13016 | 1 |
| D10012 | | B20012 | 2 | D13016 | | D13015 | 1 |
| D10013 | | D09013 | 2 | D14002 | | D14003 | 2 |
| D10015 | | D02006 | 1 | D14002 | | D03011 | 1 |
| D11001 | | D02014 | 1 | D14003 | | D18003 | 1 |
| D11003 | | D12004 | 1 | D14003 | | D14002 | 2 |
| D11003 | | D06003 | 2 | D14004 | | A24012 | 1 |
| D11008 | | D11009 | 1 | D14005 | | D14011 | 1 |
| D11009 | | D11008 | 1 | D14005 | | D05011 | 2 |
| D11009 | | D11010 | 2 | D14006 | | C05010 | 2 |
| D11010 | | D11009 | 2 | D14007 | | D13014 | 1 |
| D11010 | | D11011 | 1 | D14010 | | C20011 | 1 |
| D11011 | | D11010 | 1 | D14011 | | D29011 | 2 |
| D11011 | | D11012 | 2 | D14011 | | D14005 | 1 |
| D11012 | | D11011 | 2 | D14012 | | C09004 | 2 |
| D11013 | | D12007 | 1 | D14012 | | F08005 | 1 |
| D11013 | | D06013 | 2 | D14013 | | C21003 | 1 |
| D11015 | | D02012 | 1 | D14013 | | E15014 | 2 |
| D12002 | | JD31017 | 1 | D14014 | | D13009 | 1 |
| D12003 | | D12005 | 2 | D14014 | | D20002 | 2 |
| D12004 | | D11003 | 1 | D14015 | | D14016 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 19 | B |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D14016 | | D14015 | 1 | | | D18007 | D18014 1 |
| D15002 | | D17009 | 1 | | | D18009 | C24003 1 |
| D15003 | | C26007 | 1 | | | D18010 | C13003 1 |
| D15004 | | C18012 | 1 | | | D18011 | E15006 1 |
| D15005 | | D17013 | 1 | | | D18012 | JC31014 1 |
| D15005 | | B22002 | 2 | | | D18012 | E02005 2 |
| D15006 | | B23003 | 2 | | | D18013 | C29013 1 |
| D15007 | | D19013 | 1 | | | D18014 | D18007 1 |
| D15009 | | E07014 | 2 | | | D18015 | D18016 1 |
| D15009 | | D15012 | 1 | | | D18016 | D18015 1 |
| D15010 | | C24004 | 2 | | | D19002 | D27009 1 |
| D15011 | | C19004 | 1 | | | D19002 | C01013 2 |
| D15011 | | D16006 | 2 | | | D19003 | A12010 1 |
| D15012 | | D15009 | 1 | | | D19003 | E30010 2 |
| D15013 | | D17002 | 2 | | | D19004 | C18004 2 |
| D15014 | | D06011 | 1 | | | D19004 | F08013 1 |
| D15014 | | B14011 | 2 | | | D19009 | D13010 1 |
| D15015 | | D15016 | 1 | | PE54018 | | |
| D15016 | | D15015 | 1 | | | D19010 | A13005 1 |
| D16002 | | F23010 | 1 | | | D19010 | D19011 2 |
| D16003 | | F25007 | 1 | | | D19011 | D19010 2 |
| D16004 | | D12005 | 1 | | | D19011 | E30014 1 |
| D16005 | | D17003 | 1 | | | D19012 | D19013 2 |
| D16006 | | D15011 | 2 | | | D19012 | JE31020 1 |
| D16007 | | C16005 | 1 | | | D19013 | D15007 1 |
| D16009 | | C10004 | 1 | | | D19013 | D19012 2 |
| D16010 | | C13009 | 1 | | | D19014 | C30007 1 |
| D16011 | | C02004 | 1 | | | D19015 | D19016 1 |
| D16011 | | E14004 | 2 | | | D19016 | D19015 1 |
| D16012 | | E18002 | 1 | | | D20002 | D14014 2 |
| D16013 | | E24013 | 1 | | | D20002 | E12012 1 |
| D16014 | | E18001 | 2 | | | D20003 | C08002 1 |
| D16015 | | D16016 | 1 | | | D20003 | D20006 2 |
| D16016 | | D16015 | 1 | | | D20004 | D12013 2 |
| D17002 | | E13009 | 1 | | | D20004 | D13003 1 |
| D17002 | | D15013 | 2 | | | D20005 | A24013 1 |
| D17003 | | D16005 | 1 | | | D20006 | D20003 2 |
| D17006 | | C20013 | 1 | | | D20006 | D13011 1 |
| D17007 | | C09013 | 1 | | | D20007 | E20002 1 |
| D17009 | | D15002 | 1 | | | D20009 | B25002 1 |
| D17010 | | C17004 | 1 | | | D20010 | E20003 1 |
| D17011 | | B27014 | 1 | | | D20010 | C07014 2 |
| D17012 | | JE31045 | 1 | | | D20011 | C11015 2 |
| D17013 | | D15005 | 1 | | | D20012 | E18002 2 |
| D17014 | | F09012 | 1 | | | D20013 | D18002 1 |
| D17015 | | D17016 | 1 | | PE54018 | | |
| D17016 | | D17015 | 1 | | | D20013 | F22009 2 |
| D18002 | | D20013 | 1 | | | D20014 | JD31023 1 |
| D18003 | | D14003 | 1 | | | D20015 | D20016 1 |
| D18004 | | C01004 | 1 | | | D20016 | D20015 1 |
| D18005 | | A25003 | 1 | | | D21002 | E21013 1 |
| D18006 | | B27009 | 1 | | | D21002 | D24003 2 |
| | | | | | | D21004 | E22014 1 |
| | | | | | | D21004 | D08010 2 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 20 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D21005 | | D24002 | 1 | D24004 | | C25004 | 1 |
| D21006 | | E23012 | 1 | D24005 | | C25005 | 1 |
| D21006 | | D07010 | 2 | D24005 | | D24013 | 2 |
| D21007 | | D23002 | 1 | D24006 | | D21011 | 1 |
| D21009 | | D23006 | 1 | D24007 | | C21012 | 1 |
| D21010 | | E23013 | 1 | D24009 | | C19013 | 1 |
| D21010 | | D06006 | 2 | D24010 | | D25007 | 1 |
| D21011 | | D24006 | 1 | D24011 | | C22013 | 2 |
| D21012 | | E24011 | 1 | D24012 | | C22012 | 1 |
| D21013 | | C27002 | 1 | D24013 | | D24005 | 2 |
| D21014 | | E19004 | 2 | D24014 | | D21014 | 1 |
| D21014 | | D24014 | 1 | D24015 | | D24016 | 1 |
| D21015 | | D21016 | 1 | D24016 | | D24015 | 1 |
| D21016 | | D21015 | 1 | D25002 | | B18002 | 2 |
| D22002 | | A19015 | 2 | D25002 | | F30006 | 1 |
| D22002 | | D22003 | 1 | D25003 | | E13012 | 1 |
| D22003 | | D22002 | 1 | D25004 | | R22013 | 1 |
| D22003 | | F01004 | 2 | D25005 | | C05009 | 1 |
| D22004 | | D22005 | 1 | D25005 | | D25006 | 2 |
| D22005 | | D22004 | 1 | D25006 | | D25005 | 2 |
| D22006 | | F25005 | 1 | D25006 | | C06014 | 1 |
| D22007 | | D22014 | 1 | D25007 | | D24010 | 1 |
| D22009 | | D22013 | 1 | D25009 | | D23005 | 1 |
| D22010 | | D29006 | 1 | D25010 | | E22012 | 1 |
| D22011 | | JC31036 | 1 | D25010 | | D09010 | 2 |
| D22011 | | F25004 | 2 | D25011 | | E21014 | 1 |
| D22012 | | E25002 | 2 | D25011 | | D10010 | 2 |
| D22013 | | D22009 | 1 | D25012 | | D24003 | 1 |
| D22014 | | D22007 | 1 | D25012 | | D10006 | 2 |
| D22015 | | D22016 | 1 | D25013 | | B17011 | 1 |
| D22016 | | D22015 | 1 | D25014 | | D05010 | 1 |
| D23002 | | D21007 | 1 | D25015 | | D25016 | 1 |
| D23002 | | C26011 | 2 | D25016 | | D25015 | 1 |
| D23003 | | D23005 | 2 | D26002 | | C30006 | 1 |
| D23004 | | D23010 | 1 | D26003 | | JD31024 | 1 |
| D23005 | | D25009 | 1 | D26004 | | D27013 | 2 |
| D23005 | | D23003 | 2 | D26005 | | JD31006 | 1 |
| D23006 | | D21009 | 1 | D26006 | | D27014 | 2 |
| D23007 | | D23013 | 1 | D26007 | | JD31029 | 1 |
| D23009 | | C22014 | 1 | D26009 | | JE31035 | 1 |
| D23010 | | D23004 | 1 | D26010 | | F25011 | 1 |
| D23011 | | D23014 | 2 | D26011 | | JE31015 | 1 |
| D23012 | | C21014 | 1 | D26012 | | F25013 | 1 |
| D23013 | | D23007 | 1 | D26013 | | JE31019 | 1 |
| D23013 | | F13011 | 2 | D26014 | | F19003 | 1 |
| D23014 | | C19007 | 1 | D26015 | | D26016 | 1 |
| D23014 | | D23011 | 2 | D26016 | | D26015 | 1 |
| D23015 | | D23016 | 1 | D27002 | | JD31035 | 1 |
| D23016 | | D23015 | 1 | D27002 | | D28006 | 2 |
| D24002 | | D21005 | 1 | D27003 | | C29006 | 1 |
| D24003 | | D21002 | 2 | D27004 | | D27011 | 1 |
| D24003 | | D25012 | 1 | D27005 | | JD31013 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 21 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| D27005 | | D28010 | 2 | D30015 | | D30016 | 1 |
| D27006 | | C29010 | 1 | D30016 | | D30015 | 1 |
| D27007 | | D27010 | 1 | D31030 | | D31038 | 2 |
| D27009 | | D19002 | 1 | D31030 | | D02008 | 1 |
| D27010 | | D27007 | 1 | D31038 | | D31046 | 1 |
| D27011 | | D27004 | 1 | D31038 | | D31030 | 2 |
| D27012 | | F29009 | 1 | D31046 | | D31038 | 1 |
| D27013 | | C29007 | 1 | E01001 | | F23009 | 1 |
| D27013 | | D26004 | 2 | E01001 | | E02001 | 2 |
| D27014 | | C29009 | 1 | E01003 | | E01004 | 1 |
| D27014 | | D26006 | 2 | E01003 | | F17011 | 2 |
| D27015 | | D27016 | 1 | E01004 | | E02006 | 2 |
| D27016 | | D27015 | 1 | E01004 | | E01003 | 1 |
| D28002 | | A25004 | 1 | F01005 | | E02003 | 1 |
| D28002 | | D28003 | 2 | E01006 | | E15007 | 1 |
| D28003 | | D28002 | 2 | E01007 | | E25005 | 2 |
| D28003 | | D28004 | 1 | F01009 | | E09007 | 2 |
| D28004 | | D28003 | 1 | E01010 | | E08003 | 2 |
| D28004 | | D28014 | 2 | F01011 | | E08004 | 2 |
| D28005 | | C20010 | 2 | F01012 | | E08009 | 2 |
| D28005 | | D28011 | 1 | F01013 | | E08007 | 2 |
| D28006 | | D27002 | 2 | E01014 | | F28010 | 1 |
| D28007 | | C29005 | 1 | E02001 | | E01001 | 2 |
| D28009 | | C29011 | 1 | E02001 | | C05006 | 1 |
| D28010 | | D27005 | 2 | E02003 | | E02007 | 2 |
| D28010 | | F19014 | 1 | E02003 | | E01005 | 1 |
| D28011 | | D28005 | 1 | E02004 | | E02008 | 1 |
| D28011 | | E11004 | 2 | E02005 | | D18012 | 2 |
| D28014 | | D28004 | 2 | E02006 | | D03002 | 1 |
| D28015 | | D28016 | 1 | E02006 | | E01004 | 2 |
| D28016 | | D28015 | 1 | E02007 | | E15003 | 1 |
| D29002 | | C26014 | 1 | E02007 | | E02003 | 2 |
| D29002 | | D29005 | 2 | F02008 | | E02004 | 1 |
| D29003 | | D29007 | 1 | E02009 | | E10009 | 2 |
| D29004 | | D30009 | 1 | E02010 | | E10007 | 2 |
| D29005 | | D29002 | 2 | F02011 | | E09003 | 2 |
| D29005 | | D29011 | 1 | E02012 | | E09004 | 2 |
| D29006 | | D22010 | 1 | E02013 | | E09009 | 2 |
| D29007 | | D29003 | 1 | F02014 | | F28011 | 1 |
| D29009 | | E29011 | 1 | E03001 | | JE31004 | 1 |
| D29010 | | C23013 | 1 | E03001 | | E08005 | 2 |
| D29011 | | D29005 | 1 | F03002 | | E08009 | 1 |
| D29011 | | D14011 | 2 | F03003 | | E08007 | 1 |
| D29012 | | C23004 | 2 | E03004 | | C05007 | 1 |
| D29012 | | B26013 | 1 | E03005 | | C17012 | 1 |
| D29013 | | D29014 | 2 | E03006 | | E08004 | 1 |
| D29013 | | F20006 | 1 | E03007 | | E08003 | 1 |
| D29014 | | C23014 | 1 | E03009 | | JE31011 | 1 |
| D29014 | | D29013 | 2 | E03009 | | E08002 | 2 |
| D29015 | | D29016 | 1 | F03010 | | JE31032 | 1 |
| D29016 | | D29015 | 1 | E03010 | | E08001 | 2 |
| D30009 | | D29004 | 1 | F03011 | | E04011 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 22 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E03012 | | E04005 | 1 | | E06009 | D07005 | 1 |
| E03013 | | E04004 | 1 | | E06011 | E0600A | 2 |
| E03014 | | E04014 | 1 | | E06011 | E06012 | 1 |
| E03015 | | JE31027 | 1 | | E06012 | E06011 | 1 |
| E03015 | | E08006 | 2 | | E06014 | C11004 | 2 |
| E04001 | | JE31017 | 1 | | E06014 | E07014 | 1 |
| E04001 | | E09005 | 2 | | E06015 | E06016 | 1 |
| E04002 | | E09009 | 1 | | E06016 | E06015 | 1 |
| E04003 | | E09007 | 1 | | E07002 | C03009 | 1 |
| E04004 | | E03013 | 1 | | E07002 | E06002 | 2 |
| E04005 | | E03012 | 1 | | E07003 | E13005 | 1 |
| E04006 | | E09004 | 1 | | E07004 | JE31033 | 1 |
| E04007 | | E09003 | 1 | | E07005 | JE31028 | 1 |
| E04008 | | E31046 | 1 | | E07006 | E07007 | 1 |
| E04009 | | JD31001 | 1 | | E07007 | E07006 | 1 |
| E04009 | | E09002 | 2 | | E07007 | D06011 | 2 |
| E04010 | | JE31021 | 1 | | E07009 | F20009 | 1 |
| E04010 | | E09001 | 2 | | E07010 | E13003 | 1 |
| E04011 | | E05011 | 2 | | E07011 | JE31005 | 1 |
| E04011 | | E03011 | 1 | | E07012 | JE31012 | 1 |
| E04012 | | E05005 | 1 | | E07013 | E06009 | 2 |
| E04013 | | E05004 | 1 | | F07014 | D15009 | 2 |
| E04014 | | E05014 | 2 | | E07014 | E06014 | 1 |
| E04014 | | E03014 | 1 | | F07015 | E07016 | 1 |
| E04015 | | JE31014 | 1 | | E07016 | E07015 | 1 |
| E04015 | | E09006 | 2 | | E08001 | E03010 | 2 |
| E05001 | | JD31010 | 1 | | E08002 | E03009 | 2 |
| E05001 | | E10005 | 2 | | F08003 | E03007 | 1 |
| E05002 | | E10009 | 1 | | E08003 | E01010 | 2 |
| E05003 | | E10007 | 1 | | E08004 | E03006 | 1 |
| E05004 | | E04013 | 1 | | E08004 | E01011 | 2 |
| E05005 | | E04012 | 1 | | E08005 | E03001 | 2 |
| E05008 | | E05009 | 1 | | E08006 | E03015 | 2 |
| E05009 | | E0500A | 1 | | E08007 | E03003 | 1 |
| E05009 | | E05010 | 2 | | E08007 | E01013 | 2 |
| E05010 | | E05009 | 2 | | E08009 | E03002 | 1 |
| E05011 | | C24007 | 1 | | E08009 | E01012 | 2 |
| E05011 | | E04011 | 2 | | F08010 | F23012 | 1 |
| E05013 | | F23006 | 1 | | E08010 | E09010 | 2 |
| E05014 | | D12012 | 1 | | E08011 | E09011 | 1 |
| E05014 | | E04014 | 2 | | E08012 | D06012 | 1 |
| E05015 | | JD31027 | 1 | | E08013 | D06004 | 1 |
| E05015 | | E10006 | 2 | | E08014 | D07012 | 1 |
| E06002 | | E07002 | 2 | | E08015 | D07004 | 1 |
| E06004 | | E0600A | 1 | | E09001 | E04010 | 2 |
| E06005 | | JE31037 | 1 | | F09002 | E04009 | 2 |
| E06006 | | E06007 | 1 | | E09003 | E04007 | 1 |
| E06007 | | E06006 | 1 | | E09003 | E02011 | 2 |
| E06007 | | E13002 | 2 | | E09004 | E04006 | 1 |
| E06008 | | E06004 | 1 | | E09004 | E02012 | 2 |
| E06008 | | E06011 | 2 | | E09005 | E04001 | 2 |
| E06009 | | E07013 | 2 | | E09006 | E04015 | 2 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 23 | REV. A |
|--------------------------------------------|---------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E09007 | | E04003 | 1 | E12005 | | E11007 | 1 |
| E09007 | | E01009 | 2 | E12005 | | F10003 | 2 |
| E09009 | | E04002 | 1 | E12006 | JC31001 | | 1 |
| E09009 | | E02013 | 2 | E12007 | | F05002 | 1 |
| E09010 | | E08010 | 2 | E12009 | | F27001 | 1 |
| E09010 | | E10010 | 1 | E12010 | | E12011 | 1 |
| E09011 | | E10011 | 2 | E12011 | | C17002 | 2 |
| E09011 | | E08011 | 1 | E12011 | | E12010 | 1 |
| E09012 | | D08012 | 1 | E12012 | | D20002 | 1 |
| E09013 | | D08004 | 1 | E12012 | | E24010 | 2 |
| E09014 | | D09012 | 1 | E12013 | | F10002 | 1 |
| E09015 | | D09004 | 1 | E12014 | | C04009 | 1 |
| E10001 | | E10002 | 1 | E12015 | | E12016 | 1 |
| E10002 | | E10001 | 1 | E12016 | | E12015 | 1 |
| E10002 | | E10003 | 2 | E13002 | | E06007 | 2 |
| E10003 | | E10002 | 2 | E13002 | | D08011 | 1 |
| E10003 | | E10004 | 1 | E13003 | | E07010 | 1 |
| E10004 | | E10003 | 1 | E13003 | | D06005 | 2 |
| E10004 | | E10008 | 2 | E13004 | | E13011 | 1 |
| E10005 | | E05001 | 2 | E13005 | | E07003 | 1 |
| E10006 | | E05015 | 2 | E13005 | | D07011 | 2 |
| E10007 | | E05003 | 1 | E13006 | JC31018 | | 1 |
| E10007 | | E02010 | 2 | E13007 | | E13010 | 1 |
| E10008 | | E10004 | 2 | E13009 | | D17002 | 1 |
| E10009 | | E05002 | 1 | E13010 | | E13007 | 1 |
| E10009 | | E02009 | 2 | E13011 | | E13004 | 1 |
| E10010 | | E09010 | 1 | E13012 | | D25003 | 1 |
| E10011 | | D13007 | 1 | E13013 | | C13006 | 2 |
| E10011 | | E09011 | 2 | E13013 | | F13010 | 1 |
| E10012 | | D10012 | 1 | E13014 | | C14003 | 1 |
| F10013 | | D10004 | 1 | E13014 | | F23010 | 2 |
| E11002 | | C26010 | 1 | E13015 | | E13016 | 1 |
| E11003 | | E12003 | 2 | E13016 | | E13015 | 1 |
| E11004 | | D28011 | 2 | E14002 | | E23001 | 1 |
| E11004 | | F13013 | 1 | E14002 | | E14005 | 2 |
| E11005 | | C15011 | 1 | E14003 | | F05012 | 1 |
| E11005 | | E11011 | 2 | E14004 | | D16011 | 2 |
| E11007 | | E12005 | 1 | E14005 | | E14002 | 2 |
| E11009 | | E29002 | 1 | E14006 | | C12006 | 1 |
| E11011 | | E11005 | 2 | E14010 | | B07002 | 1 |
| E11011 | | E18003 | 1 | E14011 | | F28004 | 1 |
| E11012 | | D05012 | 1 | E14011 | | C15001 | 2 |
| E11013 | | E11014 | 1 | E14012 | | F21010 | 1 |
| F11013 | | D05010 | 2 | E14012 | | E14013 | 2 |
| E11014 | | F09010 | 2 | E14013 | | E14012 | 2 |
| E11014 | | E11013 | 1 | E14014 | | A25012 | 1 |
| E11015 | | E11016 | 1 | E14015 | | E14016 | 1 |
| E11016 | | E11015 | 1 | E14016 | | E14015 | 1 |
| E12002 | JC31025 | | 1 | E15002 | JC31017 | | 1 |
| E12003 | | C25006 | 1 | E15003 | | E15006 | 2 |
| E12003 | | E11003 | 2 | E15003 | | E02007 | 1 |
| E12004 | | C04012 | 1 | E15004 | | E15005 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 24 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E15005 | | E15004 | 1 | E18004 | | E18005 | 1 |
| E15005 | | E20012 | 2 | E18005 | | E18004 | 1 |
| E15006 | | D18011 | 1 | E18005 | | E18006 | 2 |
| E15006 | | E15003 | 2 | E18006 | | E18005 | 2 |
| E15007 | | E01006 | 1 | E18006 | | E18007 | 1 |
| E15009 | | C27012 | 1 | E18007 | | E18006 | 1 |
| E15010 | | F10013 | 1 | E18007 | | E18009 | 2 |
| E15010 | | C28002 | 2 | E18009 | | E18007 | 2 |
| E15011 | | J031020 | 1 | E18009 | | E18010 | 1 |
| E15012 | | C17011 | 1 | E18010 | | E18009 | 1 |
| E15013 | | F05004 | 1 | E18010 | | E19014 | 2 |
| E15013 | | C24010 | 2 | E18012 | | E17001 | 1 |
| E15014 | | D14013 | 2 | E18013 | | E17014 | 1 |
| E15014 | | F05006 | 1 | E18014 | | E17015 | 1 |
| E15015 | | E15016 | 1 | E19002 | | E19005 | 2 |
| E15016 | | E15015 | 1 | E19002 | | E25001 | 1 |
| E16002 | | E17013 | 1 | E19003 | | C09012 | 2 |
| E16002 | | B18003 | 2 | E19004 | | E24012 | 1 |
| E16003 | | B16003 | 1 | E19004 | | D21014 | 2 |
| E16004 | | E17012 | 1 | E19005 | | E19014 | 1 |
| E16004 | | E19012 | 2 | E19005 | | E19002 | 2 |
| E16005 | | C24006 | 1 | E19006 | | E18001 | 1 |
| E16006 | | E17011 | 1 | E19009 | | E19013 | 1 |
| E16006 | | D13002 | 2 | E19010 | | F23014 | 1 |
| E16007 | | C24004 | 1 | E19011 | | D13003 | 2 |
| E16009 | | JF31003 | 1 | E19012 | | E16004 | 2 |
| E16010 | | E17010 | 1 | E19012 | | F24006 | 1 |
| E16010 | | F14014 | 2 | E19013 | | E19009 | 1 |
| E16011 | | C03011 | 1 | E19014 | | E18010 | 2 |
| E16012 | | E17009 | 1 | E19014 | | E19005 | 1 |
| E16013 | | F15014 | 1 | E19015 | | E19016 | 1 |
| E16014 | | E17005 | 1 | E19016 | | E19015 | 1 |
| E16014 | | C13005 | 2 | E20002 | | D20007 | 1 |
| E16015 | | E16016 | 1 | E20002 | | B16014 | 2 |
| E16016 | | E16015 | 1 | F20003 | | D20010 | 1 |
| E17001 | | E18012 | 1 | E20006 | | JC31010 | 1 |
| E17002 | | B25004 | 1 | E20007 | | C03002 | 1 |
| E17005 | | E16014 | 1 | E20009 | | C17014 | 1 |
| E17009 | | E16012 | 1 | E20010 | | B16007 | 1 |
| E17010 | | E16010 | 1 | E20011 | | E25006 | 1 |
| E17011 | | E16006 | 1 | F20012 | | E15005 | 2 |
| E17012 | | E16004 | 1 | F20012 | | E25005 | 1 |
| E17013 | | E16002 | 1 | F20013 | | E28004 | 1 |
| E17014 | | E18013 | 1 | E20014 | | F18014 | 1 |
| E17015 | | E18014 | 1 | E20014 | | B16012 | 2 |
| E18001 | | E19006 | 1 | E20015 | | E20016 | 1 |
| E18001 | | D16014 | 2 | E20016 | | E20015 | 1 |
| E18002 | | D16012 | 1 | E21001 | | E26006 | 2 |
| E18002 | | D20012 | 2 | E21001 | | E22001 | 1 |
| E18003 | | E11011 | 1 | E21002 | | E22002 | 2 |
| E18003 | | E18004 | 2 | F21002 | | F30002 | 1 |
| E18004 | | E18003 | 2 | E21003 | | E21004 | 1 |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 25 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| E21004 | | E21003 | 1 | E23010 | | E28014 | 1 |
| E21004 | | E21005 | 2 | E23011 | | D07006 | 1 |
| E21005 | | E21004 | 2 | E23012 | | D21006 | 1 |
| E21005 | | E21006 | 1 | E23013 | | D21010 | 1 |
| E21006 | | E21005 | 1 | E23014 | | D06010 | 1 |
| E21006 | | E21008 | 2 | E23015 | | E22010 | 1 |
| E21007 | | E22007 | 1 | E24001 | | E24003 | 1 |
| E21008 | | E21006 | 2 | E24001 | | E23010 | 2 |
| E21009 | | E22009 | 2 | E24002 | | E25015 | 1 |
| E21010 | | E22015 | 1 | E24002 | | E23002 | 2 |
| E21012 | | D05002 | 1 | E24003 | | E25010 | 2 |
| E21013 | | D21002 | 1 | E24003 | | E24001 | 1 |
| E21014 | | D25011 | 1 | E24004 | | E24005 | 1 |
| E22001 | | E21001 | 1 | E24005 | | E24004 | 1 |
| E22001 | | E23001 | 2 | E24005 | | E24006 | 2 |
| E22002 | | E23002 | 1 | E24006 | | E24005 | 2 |
| E22002 | | E21002 | 2 | E24006 | | E24008 | 1 |
| E22003 | | E22004 | 1 | E24007 | | E24010 | 1 |
| E22004 | | E22003 | 1 | E24007 | | E29005 | 2 |
| E22004 | | E22005 | 2 | E24008 | | E24006 | 1 |
| E22005 | | E22004 | 2 | E24009 | | C28014 | 1 |
| E22005 | | E22006 | 1 | E24009 | | E23009 | 2 |
| E22006 | | E22005 | 1 | E24010 | | E12012 | 2 |
| E22006 | | E22008 | 2 | E24010 | | E24007 | 1 |
| E22007 | | E23007 | 2 | E24011 | | D21012 | 1 |
| E22007 | | E21007 | 1 | E24012 | | E19004 | 1 |
| E22008 | | E22006 | 2 | E24013 | | D16013 | 1 |
| E22009 | | E27001 | 1 | E24014 | | F10014 | 1 |
| E22009 | | E21009 | 2 | E24015 | | E23007 | 1 |
| E22010 | | E23015 | 1 | E25001 | | E19002 | 1 |
| E22011 | | D09006 | 1 | E25001 | | E25007 | 2 |
| E22012 | | D25010 | 1 | E25002 | | D22012 | 2 |
| E22013 | | F20004 | 1 | E25002 | | A22002 | 1 |
| E22014 | | D21004 | 1 | E25003 | | E25004 | 1 |
| E22015 | | E21010 | 1 | E25004 | | E25003 | 1 |
| E23001 | | E22001 | 2 | E25004 | | E25008 | 2 |
| E23001 | | E14002 | 1 | E25005 | | E20012 | 1 |
| E23002 | | E24002 | 2 | E25005 | | E01007 | 2 |
| E23002 | | E22002 | 1 | E25006 | | E20011 | 1 |
| E23003 | | E23004 | 1 | E25007 | | E25001 | 2 |
| E23004 | | E23003 | 1 | E25007 | | E25010 | 1 |
| E23004 | | E23005 | 2 | E25008 | | E25004 | 2 |
| E23005 | | E23004 | 2 | E25009 | | F30004 | 1 |
| E23005 | | E23006 | 1 | F25010 | | E25007 | 1 |
| E23006 | | E23005 | 1 | E25010 | | E24003 | 2 |
| E23006 | | E23008 | 2 | F25015 | | E24002 | 1 |
| E23007 | | E24015 | 1 | E26001 | | F13012 | 1 |
| E23007 | | E22007 | 2 | E26002 | | C10012 | 2 |
| E23008 | | E23006 | 2 | E26002 | | F27010 | 1 |
| E23009 | | E24009 | 2 | E26003 | | C09005 | 2 |
| E23009 | | E28011 | 1 | E26003 | | E26004 | 1 |
| E23010 | | E24001 | 2 | E26004 | | E26003 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 26 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| | E26004 | E26005 | 2 | E29004 | F18005 | 1 | |
| | E26005 | E26004 | 2 | E29005 | E24007 | 2 | |
| | F26005 | E26006 | 1 | E29006 | B27002 | 2 | |
| | E26006 | E26005 | 1 | E29007 | F24003 | 1 | |
| | E26006 | E21001 | 2 | E29009 | E26009 | 1 | |
| | E26007 | C23003 | 1 | E29010 | F10007 | 1 | |
| | E26007 | F13006 | 2 | E29010 | C16011 | 2 | |
| | E26009 | E29009 | 1 | E29011 | D29009 | 1 | |
| | E26010 | E27010 | 2 | E29011 | F20003 | 2 | |
| | E26010 | F29002 | 1 | E29012 | E27007 | 2 | |
| | E26012 | F18010 | 1 | E29013 | E27013 | 1 | |
| | E26013 | B16011 | 1 | E29013 | A27003 | 2 | |
| | E26014 | B16010 | 1 | E29014 | E27014 | 1 | |
| | E27001 | E28011 | 2 | E29014 | A27013 | 2 | |
| | E27001 | E22009 | 1 | F29015 | E29016 | 1 | |
| | E27002 | F19009 | 1 | E29016 | E29015 | 1 | |
| | E27002 | E28012 | 2 | E30002 | D08007 | 2 | |
| | E27003 | E28005 | 1 | E30002 | F27003 | 1 | |
| | E27003 | E27009 | 2 | E30003 | F10005 | 1 | |
| | E27004 | E27005 | 1 | E30004 | B16009 | 1 | |
| | E27005 | E27004 | 1 | E30004 | F08004 | 2 | |
| | E27005 | E27006 | 2 | E30005 | F15004 | 1 | |
| | F27006 | E27005 | 2 | E30009 | C18002 | 1 | |
| | E27006 | E27008 | 1 | E30010 | D19003 | 2 | |
| | E27007 | E29012 | 2 | E30013 | C18006 | 1 | |
| | E27007 | F08003 | 1 | E30014 | D19011 | 1 | |
| | E27008 | E27006 | 1 | E30015 | E30016 | 1 | |
| | E27009 | E27003 | 2 | E30016 | E30015 | 1 | |
| | E27009 | E27010 | 1 | F31030 | E31038 | 1 | |
| | E27010 | E27009 | 1 | E31038 | E31030 | 1 | |
| | E27010 | E26010 | 2 | F31038 | E31046 | 2 | |
| | E27013 | E29013 | 1 | E31046 | E31038 | 2 | |
| | E27014 | E29014 | 1 | F31046 | E04008 | 1 | |
| | F28002 | B25010 | 2 | F01007 | B24014 | 2 | |
| | F28002 | E28003 | 1 | F01003 | B18011 | 1 | |
| | F28003 | E28002 | 1 | F01004 | D22003 | 2 | |
| | F28003 | JF31024 | 2 | F01005 | JF31007 | 2 | |
| | E28004 | E20013 | 1 | F01006 | F03013 | 1 | |
| | E28005 | E28014 | 2 | F01007 | F04009 | 1 | |
| | F28005 | E27003 | 1 | F01008 | F04007 | 1 | |
| | E28006 | F18002 | 1 | F01009 | F04005 | 1 | |
| | F28009 | B27013 | 1 | F01010 | F03007 | 1 | |
| | E28011 | E23009 | 1 | F01011 | F03009 | 1 | |
| | F28011 | E27001 | 2 | F01012 | F01015 | 2 | |
| | F28012 | E27002 | 2 | F01013 | F01014 | 1 | |
| | E28013 | A25011 | 2 | F01013 | F02008 | 2 | |
| | E28014 | E23010 | 1 | F01014 | F06007 | 2 | |
| | E28014 | E28005 | 2 | F01014 | F01013 | 1 | |
| | E28015 | E28016 | 1 | F01015 | C20005 | 1 | |
| | E28016 | E28015 | 1 | F01015 | F01012 | 2 | |
| | E29002 | E11009 | 1 | F02002 | B06003 | 1 | |
| | E29003 | F14009 | 1 | F02003 | F06008 | 1 | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 27 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F02004 | | C10009 | 1 | F06004 | | F04011 | 1 |
| F02005 | | F06013 | 1 | F06005 | | F04013 | 1 |
| F02008 | | F01013 | 2 | F06006 | | F03011 | 1 |
| F02015 | | F02016 | 1 | F06007 | | F01014 | 2 |
| F02016 | | F02015 | 1 | F06008 | | F02003 | 1 |
| F03002 | | B11014 | 1 | F06013 | | F02005 | 1 |
| F03003 | | F06003 | 1 | F06015 | | F04003 | 1 |
| F03004 | | B11002 | 1 | F08002 | | F14011 | 2 |
| F03005 | | F06002 | 1 | F08002 | | F08011 | 1 |
| F03006 | | B20014 | 1 | F08003 | | E27007 | 1 |
| F03007 | | F01010 | 1 | F08003 | | F10013 | 2 |
| F03009 | | F01011 | 1 | F08004 | | E30004 | 2 |
| F03010 | | B20002 | 1 | F08005 | | D14012 | 1 |
| F03011 | | F06006 | 1 | F08007 | | C26012 | 1 |
| F03012 | | B09006 | 1 | F08010 | | F09013 | 1 |
| F03012 | | JF31001 | 2 | F08011 | | F08002 | 1 |
| F03013 | | F01006 | 1 | F08012 | | D03005 | 1 |
| F03014 | | JF31002 | 2 | F08013 | | D19004 | 1 |
| F03015 | | F03016 | 1 | F08013 | | F08014 | 2 |
| F03016 | | F03015 | 1 | F08014 | | F08013 | 2 |
| F04002 | | B14014 | 1 | F08015 | | F08016 | 1 |
| F04003 | | F06015 | 1 | F08016 | | F08015 | 1 |
| F04004 | | B14002 | 1 | F09002 | | F15014 | 2 |
| F04005 | | F01009 | 1 | F09003 | | JC31013 | 1 |
| F04006 | | B13014 | 1 | F09003 | | F18003 | 2 |
| F04007 | | F01008 | 1 | F09004 | | F14002 | 1 |
| F04008 | | F31036 | 1 | F09005 | | C07003 | 2 |
| F04009 | | F01007 | 1 | F09006 | | JD31009 | 1 |
| F04010 | | B13002 | 1 | F09007 | | F24011 | 1 |
| F04011 | | F06004 | 1 | F09009 | | F23002 | 1 |
| F04012 | | B12014 | 1 | F09010 | | F14007 | 1 |
| F04013 | | F06005 | 1 | F09010 | | E11014 | 2 |
| F04014 | | B12002 | 1 | F09011 | | C07010 | 1 |
| F04015 | | F04016 | 1 | F09011 | | F24010 | 2 |
| F04016 | | F04015 | 1 | F09012 | | D17014 | 1 |
| F05002 | | E12007 | 1 | F09013 | | F08010 | 1 |
| F05003 | | D12009 | 1 | F09013 | | B24002 | 2 |
| F05004 | | E15013 | 1 | F09014 | | F05009 | 1 |
| F05005 | | C04014 | 2 | F09015 | | F09016 | 1 |
| F05006 | | E15014 | 1 | F09016 | | F09015 | 1 |
| F05007 | | C09002 | 1 | F10002 | | E12013 | 1 |
| F05008 | | F31046 | 1 | F10003 | | E12005 | 2 |
| F05009 | | F09014 | 1 | F10004 | | F15003 | 1 |
| F05010 | | C29011 | 2 | F10005 | | E30003 | 1 |
| F05011 | | F19013 | 1 | F10006 | | D08009 | 1 |
| F05012 | | E14003 | 1 | F10006 | | F20014 | 2 |
| F05013 | | C06007 | 1 | F10007 | | E29010 | 1 |
| F05014 | | C13002 | 2 | F10009 | | C29014 | 1 |
| F05015 | | F05016 | 1 | F10010 | | B27004 | 1 |
| F05016 | | F05015 | 1 | F10011 | | F20007 | 1 |
| F06002 | | F03005 | 1 | F10012 | | B22012 | 1 |
| F06003 | | F03003 | 1 | F10013 | | F08003 | 2 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. | |
|--------------------------------------------|--------|------------------|------------|----|--------------------------------------------|-----------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 28 | B | |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| | F10013 | E15010 | 1 | | | F15010 | B26006 | 2 |
| | F10014 | E24014 | 1 | | | F15010 | F15011 | 1 |
| | F10015 | F10016 | 1 | | | F15011 | F15010 | 1 |
| | F10016 | F10015 | 1 | | | F15014 | E16013 | 1 |
| | F12009 | B14009 | 1 | | | F15014 | F09002 | 2 |
| | F12010 | F21005 | 2 | | | F15015 | F15016 | 1 |
| | F12011 | B07007 | 1 | | | F15016 | F15015 | 1 |
| | F12015 | F12016 | 1 | | | F17010 | B16006 | 1 |
| | F12016 | F12015 | 1 | | | F17011 | E01003 | 2 |
| | F13002 | B26003 | 2 | | | F17011 | F17014 | 1 |
| | F13003 | C26003 | 2 | | | F17012 | F30010 | 1 |
| | F13004 | C27013 | 1 | | | F17013 | F19006 | 2 |
| | F13005 | F18011 | 1 | | PE54015 | F17014 | F17011 | 1 |
| | F13006 | E26007 | 2 | | | F17015 | F17016 | 1 |
| | F13007 | C16010 | 1 | | | F18002 | E28006 | 1 |
| | F13009 | C26002 | 1 | | | F18003 | F09003 | 2 |
| | F13010 | E13013 | 1 | | | F18003 | F25010 | 1 |
| | F13011 | D23013 | 2 | | | F18004 | F18005 | 2 |
| | F13012 | E26001 | 1 | | | F18005 | E29004 | 1 |
| | F13013 | E11004 | 1 | | | F18005 | F18004 | 2 |
| | F13013 | JF31006 | 2 | | | F18006 | F14012 | 1 |
| | F13014 | F19005 | 1 | | | F18007 | F19006 | 1 |
| | F13015 | F13016 | 1 | | | F18009 | F19010 | 1 |
| | F13016 | F13015 | 1 | | | F18010 | E26012 | 1 |
| | F14002 | F09004 | 1 | | | F18010 | F18014 | 2 |
| | F14003 | F14013 | 2 | | | F18011 | C23005 | 2 |
| | F14003 | C03005 | 1 | | | F18011 | F13005 | 1 |
| | F14004 | C07012 | 1 | | | F18014 | F18010 | 2 |
| | F14004 | F14012 | 2 | | | F18014 | E20014 | 1 |
| | F14005 | F14014 | 1 | | | F18015 | F18016 | 1 |
| | F14007 | F09010 | 1 | | | F18016 | F18015 | 1 |
| | F14009 | E29003 | 1 | | | F19002 | A13010 | 1 |
| | F14011 | F27009 | 1 | | | F19003 | D26014 | 1 |
| | F14011 | F08002 | 2 | | | F19004 | C23006 | 1 |
| | F14012 | F14004 | 2 | | | F19005 | F13014 | 1 |
| | F14012 | F18006 | 1 | | | F19006 | F18007 | 1 |
| | F14013 | F24009 | 1 | | | F19006 | F17013 | 2 |
| | F14013 | F14003 | 2 | | | F19006 | B16006 | 2 |
| | F14014 | E16010 | 2 | | | F19007 | C11005 | 1 |
| | F14014 | F14005 | 1 | | | F19009 | E27002 | 1 |
| | F14015 | F14016 | 1 | | | F19010 | F18009 | 1 |
| | F14016 | F14015 | 1 | | | F19011 | F21009 | 1 |
| | F15002 | C02009 | 1 | | | F19012 | C05004 | 1 |
| | F15003 | F10004 | 1 | | | F19013 | F05011 | 1 |
| | F15003 | F15006 | 2 | | | F19014 | D28010 | 1 |
| | F15004 | E30005 | 1 | | | F19015 | F19016 | 1 |
| | F15004 | A25010 | 2 | | | F19016 | F19015 | 1 |
| | F15005 | C23007 | 1 | | | F20002 | D07007 | 1 |
| | F15006 | F15003 | 2 | | | F20003 | E29011 | 2 |
| | F15006 | C03014 | 1 | | | F20003 | B26014 | 1 |
| | F15007 | B30009 | 1 | | | F20004 | E22013 | 1 |
| | F15009 | C08014 | 1 | | | F20004 | D08006 | 2 |
| | | | | | | F20005 | C23009 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 29 | B |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| | F20006 | D29013 | 1 | F24011 | F09007 | 1 | |
| | F20007 | F10011 | 1 | F24011 | C07013 | 2 | |
| | F20009 | E07009 | 1 | F24012 | B13006 | 1 | |
| | F20010 | JE31044 | 1 | F24013 | F23002 | 2 | |
| | F20010 | C19003 | 2 | F24014 | C07006 | 1 | |
| | F20011 | C20012 | 1 | F24015 | F24016 | 1 | |
| | F20012 | B17003 | 1 | F24016 | F24015 | 1 | |
| | F20013 | F25002 | 1 | F25002 | F20013 | 1 | |
| | F20014 | F10006 | 2 | F25003 | C28003 | 1 | |
| | F20015 | F20016 | 1 | F25004 | D22011 | 2 | |
| | F20016 | F20015 | 1 | F25005 | D22006 | 1 | |
| | F21005 | F28002 | 1 | F25006 | J031040 | 1 | |
| | F21005 | F12010 | 2 | F25007 | D16003 | 1 | |
| | F21006 | F22015 | 1 | F25009 | D05001 | 1 | |
| | F21007 | F22002 | 2 | F25010 | F18003 | 1 | |
| | F21009 | F19011 | 1 | F25011 | D26010 | 1 | |
| | F21009 | A25013 | 2 | F25012 | A19012 | 2 | |
| | F21010 | F21011 | 2 | F25013 | D26012 | 1 | |
| | F21010 | E14012 | 1 | F25014 | A19014 | 2 | |
| | F21011 | C15006 | 1 | F25015 | F25016 | 1 | |
| | F21011 | F21010 | 2 | F25016 | F25015 | 1 | |
| | F21012 | F30014 | 1 | F27001 | E12009 | 1 | |
| | F22001 | F22002 | 1 | F27001 | H30001 | 2 | |
| | F22002 | F22001 | 1 | F27002 | F27003 | 2 | |
| | F22002 | F21007 | 2 | F27003 | E30002 | 1 | |
| | F22009 | D20013 | 2 | F27003 | F27002 | 2 | |
| | F22015 | F21006 | 1 | F27009 | F29002 | 2 | |
| | F23002 | F09009 | 1 | F27009 | F14011 | 1 | |
| | F23002 | F24013 | 2 | F27010 | E26002 | 1 | |
| | F23003 | C07007 | 1 | F27014 | D09007 | 1 | |
| | F23004 | B13010 | 1 | F27015 | D09009 | 1 | |
| | F23005 | JC31007 | 1 | F28002 | F21005 | 1 | |
| | F23005 | F23011 | 2 | F28003 | H16003 | 2 | |
| | F23006 | E05013 | 1 | F28004 | F14011 | 1 | |
| | F23007 | C24005 | 1 | F28009 | D12014 | 1 | |
| | F23009 | E01001 | 1 | F28010 | E01014 | 1 | |
| | F23010 | E13014 | 2 | F28011 | E02014 | 1 | |
| | F23010 | D16002 | 1 | F28015 | F28016 | 1 | |
| | F23011 | F23005 | 2 | F28016 | F28015 | 1 | |
| | F23012 | E08010 | 1 | F29002 | E26010 | 1 | |
| | F23013 | JC31032 | 1 | F29002 | F27009 | 2 | |
| | F23014 | E19010 | 1 | F29003 | D10011 | 1 | |
| | F23015 | F23016 | 1 | F29004 | F29005 | 1 | |
| | F23016 | F23015 | 1 | F29005 | F29004 | 1 | |
| | F24002 | H25009 | 1 | F29005 | F29008 | 2 | |
| | F24003 | E29007 | 1 | F29006 | F29007 | 1 | |
| | F24004 | JF31009 | 1 | F29007 | F29006 | 1 | |
| | F24005 | JC31029 | 1 | F29007 | D09011 | 2 | |
| | F24006 | E19012 | 1 | F29008 | F29005 | 2 | |
| | F24007 | C17013 | 1 | F29008 | F29011 | 1 | |
| | F24009 | F14013 | 1 | F29009 | D27012 | 1 | |
| | F24010 | F09011 | 2 | F29010 | D09005 | 1 | |
| PE54018 | | | | | | | |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 30 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| F29011 | | F29008 | 1 | F31041 | | F31040 | 1 |
| F29011 | | F29012 | 2 | F31041 | | F31042 | 2 |
| F29012 | | F29011 | 2 | F31042 | | F31041 | 2 |
| F29013 | | D10005 | 1 | F31042 | | F31043 | 1 |
| F29014 | | D13011 | 2 | F31043 | | F31042 | 1 |
| F29014 | | C30002 | 1 | F31043 | | F31044 | 2 |
| F29015 | | F29016 | 1 | F31044 | | F31043 | 2 |
| F29016 | | F29015 | 1 | F31044 | | F31045 | 1 |
| F30002 | | E21002 | 1 | F31045 | | F31044 | 1 |
| F30002 | | F30003 | 2 | F31045 | | F31046 | 2 |
| F30003 | | F30002 | 2 | F31046 | | F31045 | 2 |
| F30003 | | D13006 | 1 | F31046 | | F05008 | 1 |
| F30004 | | E25009 | 1 | JA31001 | | B06014 | 1 |
| F30005 | | F30014 | 2 | JA31002 | | A03001 | 1 |
| F30005 | | A25014 | 1 | JA31003 | | B06009 | 1 |
| F30006 | | D25002 | 1 | JA31004 | | B09009 | 1 |
| F30007 | | B20013 | 1 | JA31005 | | A02004 | 1 |
| F30009 | | C16002 | 2 | JA31006 | | B10014 | 1 |
| F30010 | | F30011 | 2 | JA31007 | | A08002 | 1 |
| F30010 | | F30011 | 2 | JA31009 | | JC31035 | 1 |
| F30010 | | F17012 | 1 | JA31009 | | JA31032 | 2 |
| F30011 | | JF31010 | 1 | JA31010 | | A04003 | 1 |
| F30011 | | F30010 | 2 | JA31011 | | A03007 | 1 |
| F30011 | | F30010 | 2 | JA31012 | | B15014 | 1 |
| F30012 | | B20003 | 1 | JA31013 | | JA31037 | 1 |
| F30013 | | B18007 | 1 | JA31014 | | B15010 | 1 |
| F30014 | | F21012 | 1 | JA31015 | | A01001 | 1 |
| F30014 | | F30005 | 2 | JA31017 | | JA31037 | 2 |
| F30015 | | F30016 | 1 | JA31017 | | JA31041 | 1 |
| F30016 | | F30015 | 1 | JA31018 | | A02006 | 1 |
| F31026 | | F31027 | 1 | JA31019 | | A02007 | 1 |
| F31027 | | F31026 | 1 | JA31020 | | JA31041 | 2 |
| F31027 | | F31028 | 2 | JA31020 | | A05008 | 1 |
| F31028 | | F31027 | 2 | JA31021 | | A03006 | 1 |
| F31028 | | F31030 | 1 | JA31022 | | A01004 | 1 |
| F31030 | | F31028 | 1 | JA31023 | | A08004 | 1 |
| F31030 | | F31028 | 1 | JA31024 | | B06013 | 1 |
| F31030 | | F31032 | 2 | JA31025 | | A03002 | 1 |
| F31032 | | F31030 | 2 | JA31026 | | B06010 | 1 |
| F31032 | | F31033 | 1 | JA31027 | | B09010 | 1 |
| F31033 | | F31032 | 1 | JA31028 | | A02003 | 1 |
| F31033 | | F31034 | 2 | JA31029 | | B10013 | 1 |
| F31034 | | F31033 | 2 | JA31032 | | JA31009 | 2 |
| F31034 | | F31035 | 1 | JA31033 | | A04004 | 1 |
| F31035 | | F31034 | 1 | JA31034 | | A03008 | 1 |
| F31035 | | F31036 | 2 | JA31035 | | B15013 | 1 |
| F31036 | | F31035 | 2 | JA31036 | | B15009 | 1 |
| F31036 | | F04008 | 1 | JA31037 | | JA31017 | 2 |
| F31037 | | F31038 | 1 | JA31037 | | JA31013 | 1 |
| F31038 | | F31037 | 1 | JA31038 | | A01002 | 1 |
| F31038 | | F31040 | 2 | JA31040 | | A02005 | 1 |
| F31040 | | F31038 | 2 | JA31041 | | JA31017 | 1 |
| F31040 | | F31041 | 1 | | | | |

| TITLE LOGIC BOARD WIRE WRAP (TB304A) | | | | WL | DOCUMENT NO. | SHEET NO. 31 | REV. A |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| JA31041 | | JA31020 | 2 | JC31009 | | C14005 | 1 |
| JA31042 | | A0200A | 1 | JC31010 | | E20006 | 1 |
| JA31043 | | A03005 | 1 | JC31012 | | B21004 | 1 |
| JA31044 | | A01003 | 1 | JC31013 | | F09003 | 1 |
| JA31045 | | A08003 | 1 | JC31014 | | D18012 | 1 |
| JA31046 | | A08005 | 1 | JC31017 | | E15007 | 1 |
| JB31001 | | B07009 | 1 | JC31018 | | E13006 | 1 |
| JB31002 | | B08014 | 1 | JC31020 | | B21002 | 1 |
| JB31003 | | B08009 | 1 | JC31021 | | C05002 | 1 |
| JB31004 | | B09014 | 1 | JC31022 | | B07006 | 1 |
| JB31005 | | A04002 | 1 | JC31023 | | B08002 | 1 |
| JB31006 | | A02001 | 1 | JC31024 | | B26002 | 1 |
| JB31007 | | A03003 | 1 | JC31025 | | E12002 | 1 |
| JB31009 | | B10009 | 1 | JC31029 | | F24005 | 1 |
| JB31010 | | A04007 | 1 | JC31032 | | F23013 | 1 |
| JB31011 | | B07014 | 1 | JC31035 | | JA31009 | 1 |
| JB31012 | | B01014 | 1 | JC31036 | | D22011 | 1 |
| JB31013 | | B01009 | 1 | JC31037 | | C25012 | 1 |
| JB31014 | | B02014 | 1 | JC31040 | | B08006 | 1 |
| JB31015 | | B02009 | 1 | JC31041 | | B09002 | 1 |
| JB31017 | | B03014 | 1 | JC31042 | | JC31043 | 1 |
| JB31018 | | B03009 | 1 | JC31043 | | B05012 | 2 |
| JB31019 | | B04014 | 1 | JC31043 | | JC31042 | 1 |
| JB31020 | | B04009 | 1 | JD31001 | | E04009 | 1 |
| JB31021 | | B05014 | 1 | JD31003 | | D02009 | 1 |
| JB31022 | | B05009 | 1 | JD31004 | | D02011 | 1 |
| JB31023 | | A04006 | 1 | JD31006 | | D26005 | 1 |
| JB31024 | | B07010 | 1 | JD31009 | | F09006 | 1 |
| JB31025 | | B08013 | 1 | JD31010 | | E05001 | 1 |
| JB31026 | | B08010 | 1 | JD31011 | | C14013 | 1 |
| JB31027 | | B09013 | 1 | JD31013 | | D27005 | 1 |
| JB31028 | | A04001 | 1 | JD31014 | | C14011 | 1 |
| JB31029 | | A02002 | 1 | JD31015 | | C02014 | 1 |
| JB31030 | | A03004 | 1 | JD31017 | | D12002 | 1 |
| JB31032 | | B10010 | 1 | JD31020 | | B17013 | 2 |
| JB31033 | | A0400A | 1 | JD31020 | | E15011 | 1 |
| JB31034 | | B07013 | 1 | JD31021 | | B17014 | 2 |
| JB31035 | | B01013 | 1 | JD31022 | | B21006 | 1 |
| JB31036 | | B01010 | 1 | JD31023 | | D20014 | 1 |
| JB31037 | | B02013 | 1 | JD31024 | | D26003 | 1 |
| JB31038 | | B02010 | 1 | JD31025 | | D02007 | 1 |
| JB31040 | | B03013 | 1 | JD31027 | | E05015 | 1 |
| JB31041 | | B03010 | 1 | JD31029 | | D26007 | 1 |
| JB31042 | | B04013 | 1 | JD31033 | | C07003 | 1 |
| JB31043 | | B04010 | 1 | JD31035 | | D27002 | 1 |
| JB31044 | | B05013 | 1 | JD31037 | | D12006 | 1 |
| JB31045 | | B05010 | 1 | JD31040 | | F25006 | 1 |
| JB31046 | | A04005 | 1 | JD31043 | | B21011 | 1 |
| JC31001 | | E12006 | 1 | JD31044 | | B21010 | 1 |
| JC31002 | | C03006 | 1 | JD31045 | | C06012 | 1 |
| JC31003 | | C02006 | 1 | JE31001 | | C18013 | 1 |
| JC31007 | | F23005 | 1 | JE31002 | | D01005 | 1 |

| TITLE | | | | WL | DOCUMENT NO. | SHEET NO. | REV. |
|--------------------------------------------|--------|------------------|------------|--------------------------------------------|--------------|------------------|------------|
| LOGIC BOARD WIRE WRAP (TB304A) | | | | | | 32 | A |
| SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL | SIGNAL NAME OR NUMBER IDENTIFICATION | ORIGIN | DESTI- NATION | Z LEVEL |
| JE31003 | A30007 | | 1 | JF31014 | | B05002 | 1 |
| JE31004 | E03001 | | 1 | JF31015 | | B04006 | 1 |
| JE31005 | E07011 | | 1 | JF31017 | | B04002 | 1 |
| JE31006 | D01007 | | 1 | JF31018 | | B23004 | 1 |
| JE31007 | A29009 | | 1 | JF31019 | | B02006 | 1 |
| JF31009 | D01009 | | 1 | JF31020 | | B01006 | 1 |
| JE31010 | A29007 | | 1 | JF31022 | | B01002 | 1 |
| JF31011 | E03009 | | 1 | JF31023 | | B02002 | 1 |
| JE31012 | E07012 | | 1 | JF31024 | | E28003 | 2 |
| JE31013 | D01011 | | 1 | JF31025 | | B14010 | 1 |
| JE31014 | E04015 | | 1 | JF31029 | | B15003 | 1 |
| JF31015 | D26011 | | 1 | | | | |
| JF31017 | E04001 | | 1 | | | | |
| JF31019 | D26013 | | 1 | | | | |
| JE31020 | D19012 | | 1 | | | | |
| JE31021 | E04010 | | 1 | | | | |
| JE31022 | D02005 | | 1 | | | | |
| JE31023 | C02013 | | 1 | | | | |
| JF31024 | C18005 | | 1 | | | | |
| JE31025 | D01003 | | 1 | | | | |
| JE31026 | A30009 | | 1 | | | | |
| JF31027 | E03015 | | 1 | | | | |
| JF31028 | E07005 | | 1 | | | | |
| JF31029 | C18007 | | 1 | | | | |
| JE31032 | E03010 | | 1 | | | | |
| JF31033 | E07004 | | 1 | | | | |
| JE31034 | C18003 | | 1 | | | | |
| JE31035 | D26009 | | 1 | | | | |
| JE31036 | A28009 | | 1 | | | | |
| JE31037 | E06005 | | 1 | | | | |
| JE31040 | D01013 | | 1 | | | | |
| JE31041 | A28007 | | 1 | | | | |
| JE31042 | D02003 | | 1 | | | | |
| JE31043 | A27009 | | 1 | | | | |
| JE31044 | F20010 | | 1 | | | | |
| JF31045 | D17012 | | 1 | | | | |
| JF31001 | F03012 | | 2 | | | | |
| JF31002 | B06006 | | 1 | | | | |
| JF31002 | F03014 | | 2 | | | | |
| JF31003 | E16009 | | 1 | | | | |
| JF31003 | C02005 | | 2 | | | | |
| JF31005 | B05006 | | 1 | | | | |
| JF31006 | F13013 | | 2 | | | | |
| JF31007 | B26005 | | 1 | | | | |
| JF31007 | F01005 | | 2 | | | | |
| JF31009 | F24004 | | 1 | | | | |
| JF31009 | B18013 | | 2 | | | | |
| JF31010 | B15007 | | 2 | | | | |
| JF31010 | F30011 | | 1 | | | | |
| JF31011 | B03006 | | 1 | | | | |
| JF31012 | B03002 | | 1 | | | | |
| JF31013 | A26003 | | 1 | | | | |

SECTION 7

PARTS DATA

INTRODUCTION

This section provides the information needed to order field replaceable parts for the TB304 Field Test Unit.

Information within this section is provided by representative illustrations and their companion parts lists. The parts shown on the illustrations are assigned index numbers. These numbers cross reference the illustrations to the associated parts lists.

The parts list associated with each illustration is organized in four columns:

- The Index Number column cross references the applicable entry to the associated illustration.
- The Part Number column provides the eight-digit number by which a part may be ordered.
- The Description column provides the part nomenclature. This column also provides information on the relationship of parts and assemblies. This is accomplished by means of indentation within the column. An indented item is part of a previous assembly which is indented to a lesser degree.
- The Notes column is used to show differences in configuration when more than one configuration of a machine is covered in the manual. This is shown by identifying a model level (Mod B), by identifying a machine series code and change order number (S/C 10 with PE39289), or by identifying the last two digits of the eight-digit assembly part number to which the particular part applies (Tab 17).

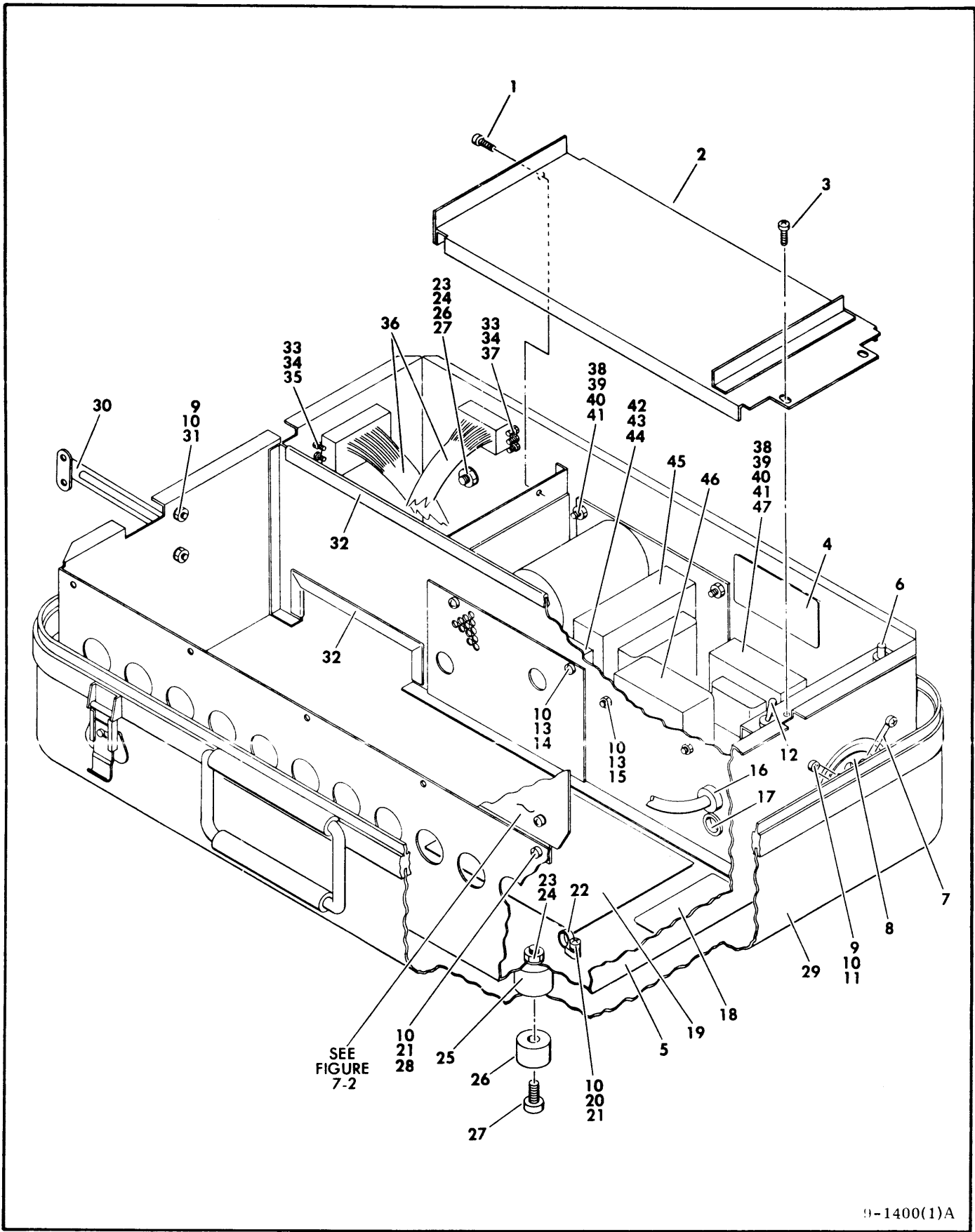
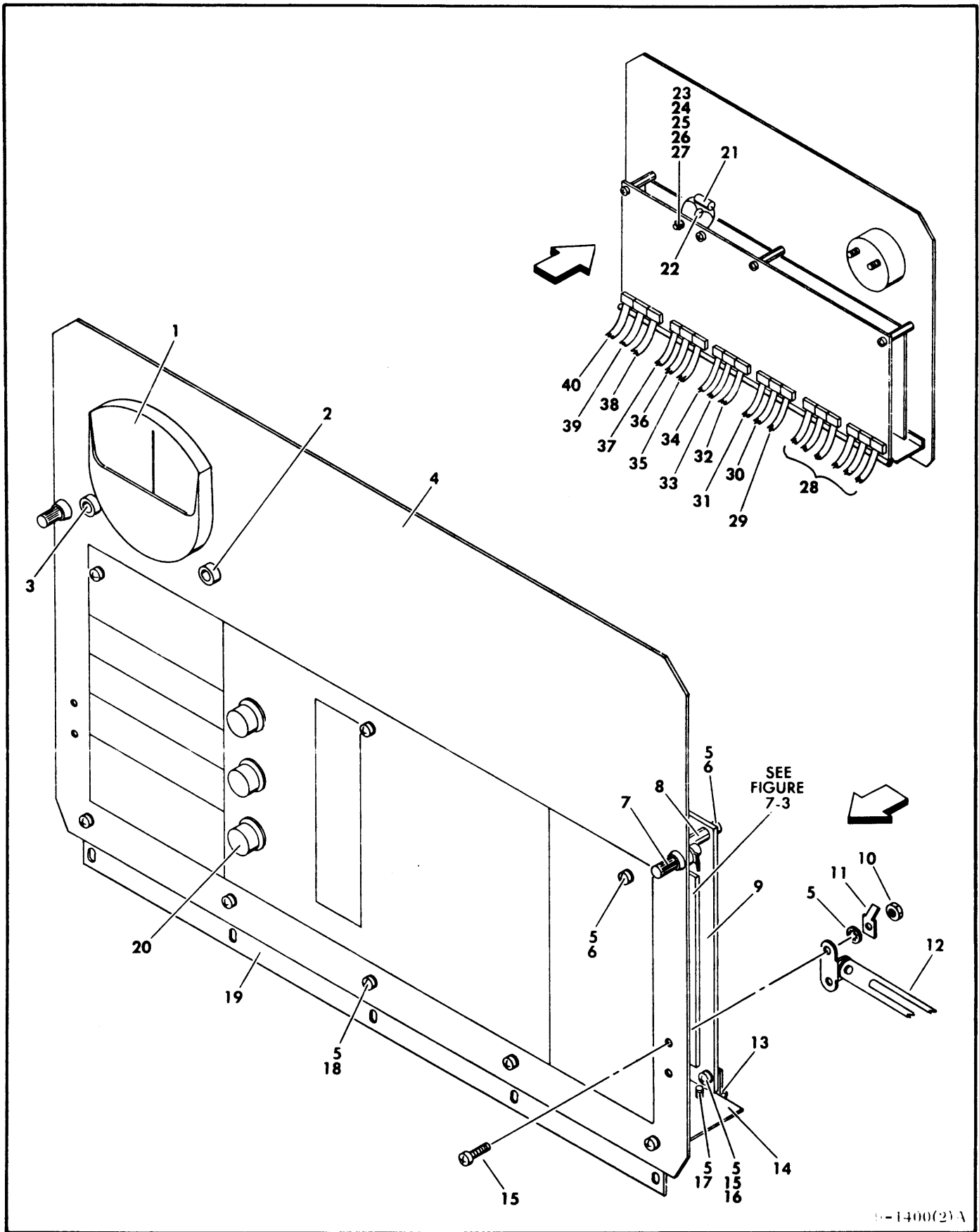


FIGURE 7-1. FINAL ASSEMBLY, STANDARD PACKAGE

| INDEX NO. | PART NUMBER | PART DESCRIPTION | NOTES |
|-----------|-------------|---------------------------------------------|----------------|
| 1- | 77449300 | FIELD TEST UNIT | TB304-A |
| 1 | 17901509 | SCREW, THREAD ROLLING, PHILLIPS, 6-32 x 3/8 | |
| 2 | 77451400 | COVER, POWER SUPPLY | |
| 3 | 17901508 | SCREW, THREAD ROLLING, PHILLIPS, 6-32 x 1/4 | |
| 4 | 46068603 | PLATE, WARNING | |
| 5 | 77451500 | HOUSING, FTU | |
| 6 | 94308204 | CIRCUIT BREAKER | |
| 7 | 94348701 | GUARD, FAN, MINIATURE | |
| 8 | 94348700 | FAN, MINIATURE | |
| 9 | 10125803 | WASHER, SPRING LOCK, 6-TOOTH | |
| 10 | 10125105 | NUT, HEX, 6-32 | |
| 11 | 92742179 | SCREW, PAN HD, PHILLIPS, 6-32 x 1-7/8 | |
| 12 | 92509009 | SWITCH, TOGGLE, 2-POSITION | |
| 13 | 10126401 | WASHER, LOCK, EXT 6-TOOTH | |
| 14 | 10127115 | SCREW, PAN HD, 6-32 x 5/8 | |
| 15 | 10127113 | SCREW, PAN HD, 6-32 x 3/8 | |
| 16 | 92491013 | RELIEF, CORD | |
| 17 | 15012410 | BUSHING, SNAP-IN | |
| 18 | 10126600 | PLATE, EQUIP. IDENT. | |
| 19 | 72959300 | LABEL, FIELD CHANGE LOG | |
| 20 | 10127114 | SCREW, PAN HD, 6-32 x 1/2 | |
| 21 | 10126103 | WASHER, LOCK, INT 6-TOOTH | |
| 22 | 94277421 | STRAP, CABLE TIE | |
| 23 | 10125301 | NUT, HEX, 1/4-20 | |
| 24 | 10126404 | WASHER, LOCK, EXT TOOTH, 1/4 | |
| 25 | 92674005 | MOUNT, VIBRATION | |
| 26 | 94202502 | BUMPER, RUBBER | |
| 27 | 10127154 | SCREW, PAN HD, 1/4-20 x 5/8 | |
| 28 | 10127111 | SCREW, PAN HD, 6-32 x 1/4 | |
| 29 | 94369500 | CASE, FIBERGLASS | |
| 30 | 94370400 | SUPPORT, LID, FRICTION | PE54023 |
| 31 | 10125714 | SCREW, FH, PHILLIPS, 6-32 x 1/4 | |
| 32 | 94060001 | CHANNEL, RUBBER, TYPE 1 | |
| 33 | 93643004 | CONNECTOR CORNER GUIDE PIN | |
| 34 | 93643005 | CONNECTOR CORNER GUIDE SOCKET | |
| 35 | 93642006 | CONNECTOR, JACK SCREW, FEMALE | |
| 36 | 77453600 | I/O CABLE ASSY | |
| 37 | 93642007 | CONNECTOR, JACK SCREW, MALE | |
| 38 | 10125106 | NUT, HEX, 8-32 | |
| 39 | 10127123 | SCREW, PAN HD, 8-32 x 1/2 | |
| 40 | 10125606 | WASHER, PLAIN, 8-TOOTH | |
| 41 | 10126402 | WASHER, LOCK, EXT 8-TOOTH | |
| 42 | 93041010 | STRIP, TERMINAL, BARRIER TYPE | |
| 43 | 93105110 | STRIP, MARKER, TYPE A-10 TERM. | |
| 44 | 93047002 | JUMPER, BARRIER STRIP | |
| 45 | 94370600 | POWER SUPPLY; +5V, 6A | |
| 46 | 94348402 | FILTER, R.F. | |
| 47 | 94368600 | POWER SUPPLY; -5V, 3A | |
| | | ASSEMBLIES NOT SHOWN | |
| | 54226509 | TYPE HFSV HD ALIGNMENT CARD ASSY | TB304 A/B ONLY |
| | 77440300 | HEAD ALIGNMENT CABLE ASSY | TB304 A/B ONLY |
| | 83249600 | A-CABLE ASSY (I/O) | |
| | 77453400 | B-CABLE ASSY (I/O) | |
| | 83248700 | I/O BYPASS (BEHIND THE I/O) CABLE ASSY | |
| | 83248900 | ADAPTER CABLE ASSY, A-CABLE, 50-PIN | |
| | 83249800 | ADAPTER CABLE ASSY, A-CABLE, 60-PIN | |
| | 83254300 | ADAPTER CABLE ASSY, B-CABLE | |
| | 92183001 | TEST LEAD, BLACK | TB304 A/B ONLY |
| | 92183003 | TEST LEAD, RED | TB304 A/B ONLY |



9-1400(2)A

FIGURE 7-2. CONTROL PANEL, STANDARD PACKAGE

| INDEX NO. | PART NUMBER | PART DESCRIPTION | NOTES |
|-----------|-------------|---------------------------------------------|---------|
| 2- | | FTU | |
| 1 | 94559700 | VOLTMETER, PANEL, DC | |
| 2 | 92183003 | JACK, BANANA, NYLON, RED | |
| 3 | 92183001 | JACK, BANANA, NYLON, BLACK | |
| 4 | 77451201 | PANEL, CONTROL | |
| 5 | 10126103 | WASHER, LOCK, INT 6-TOOTH | |
| 6 | 10127111 | SCREW, PAN HD, 6-32 x 1/4 | |
| 7 | 94358800 | LATCH, ADJUSTABLE GRIP | |
| 8 | 93114221 | STANDOFF, TAPPED POST, HEX, ALUM. | |
| 9 | 774516XX | PANEL, LOGIC, WIRE WRAP ASSY | |
| 10 | 10125105 | NUT, HEX, 6-32 | |
| 11 | 94274106 | TERMINAL, QUICK CONNECT, TYPE 3 | |
| 12 | 94370400 | SUPPORT, LID, FRICTION | PE54023 |
| 13 | 76390800 | HINGE, IC BOARD | |
| 14 | 77451300 | BRACKET, BOARD MOUNTING | |
| 15 | 10127113 | SCREW, PAN HD, 6-32 x 3/8 | |
| 16 | 95510026 | NUT, HEX | |
| 17 | 17901508 | SCREW, THREAD ROLLING, PHILLIPS, 6-32 x 1/4 | |
| 18 | 17901509 | SCREW, THREAD ROLLING, PHILLIPS, 6-32 x 3/8 | |
| 19 | 76390700 | HINGE, CONTROL PANEL | |
| 20 | 93152009 | KNOB, SKIRTED | |
| 21 | 92427039 | CAPACITOR, ELECTRO; 6.8 μ F, 35V | |
| 22 | 51001119 | CAPACITOR; 10,000PF, 25Y | |
| 23 | 93541010 | TERMINAL, RING TONGUE INS | |
| 24 | 10127104 | SCREW, PAN HD, 4-40 x 3/8 | |
| 25 | 93564004 | WASHER, NYLON | |
| 26 | 10126400 | WASHER, LOCK, EXT 4-TOOTH | |
| 27 | 10125103 | NUT, HEX, 4-40 | |
| 28 | | I/O CABLE ASSY (SEE FIGURE 7-1) | |
| 29 | 74452111 | INTERCONNECT CABLE ASSY | |
| 30 | 74452110 | INTERCONNECT CABLE ASSY | |
| 31 | 74452109 | INTERCONNECT CABLE ASSY | |
| 32 | 74452108 | INTERCONNECT CABLE ASSY | |
| 33 | 74452107 | INTERCONNECT CABLE ASSY | |
| 34 | 74452106 | INTERCONNECT CABLE ASSY | |
| 35 | 74452105 | INTERCONNECT CABLE ASSY | |
| 36 | 74452104 | INTERCONNECT CABLE ASSY | |
| 37 | 74452103 | INTERCONNECT CABLE ASSY | |
| 38 | 74452102 | INTERCONNECT CABLE ASSY | |
| 39 | 74452101 | INTERCONNECT CABLE ASSY | |
| 40 | 74452100 | INTERCONNECT CABLE ASSY | |

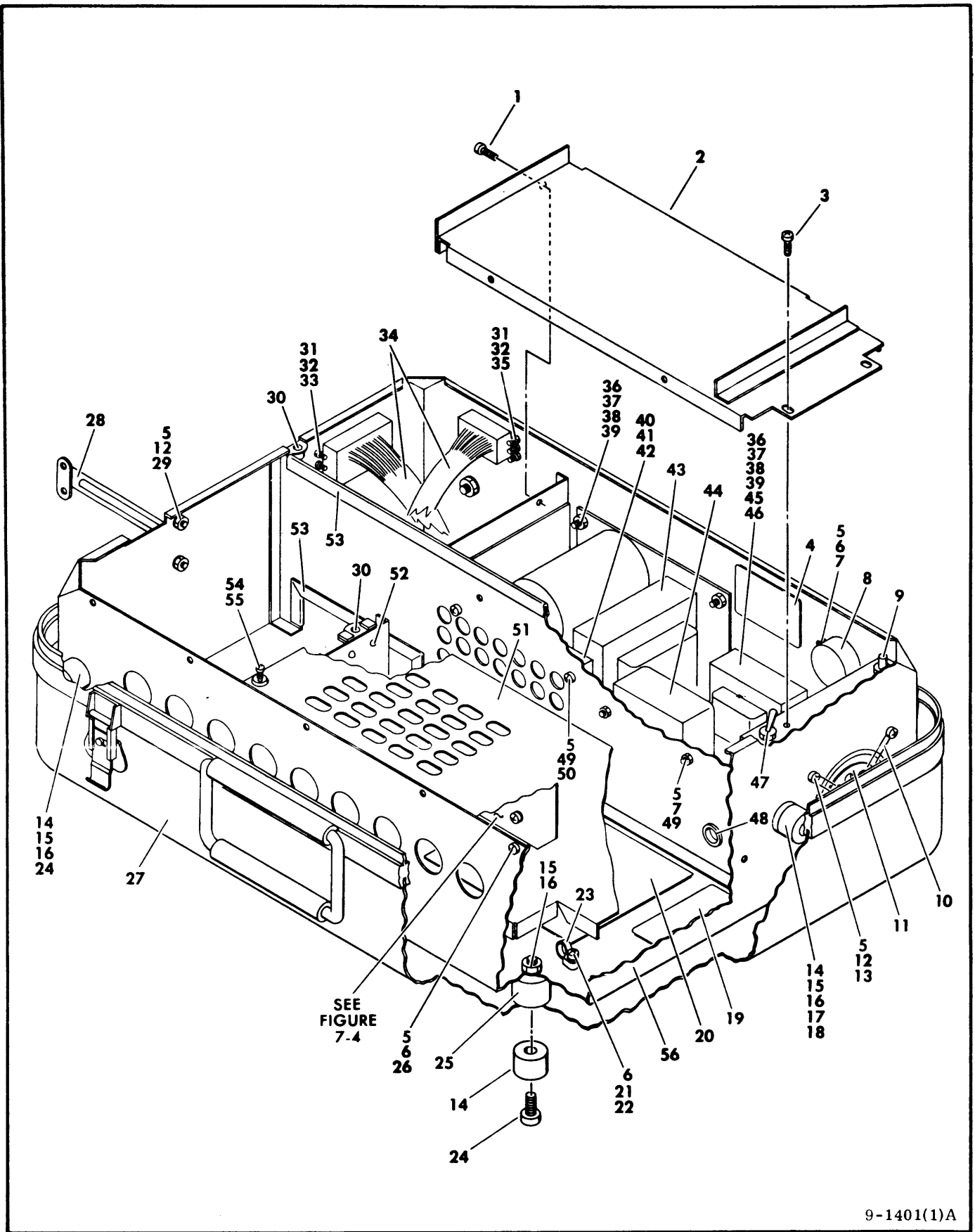
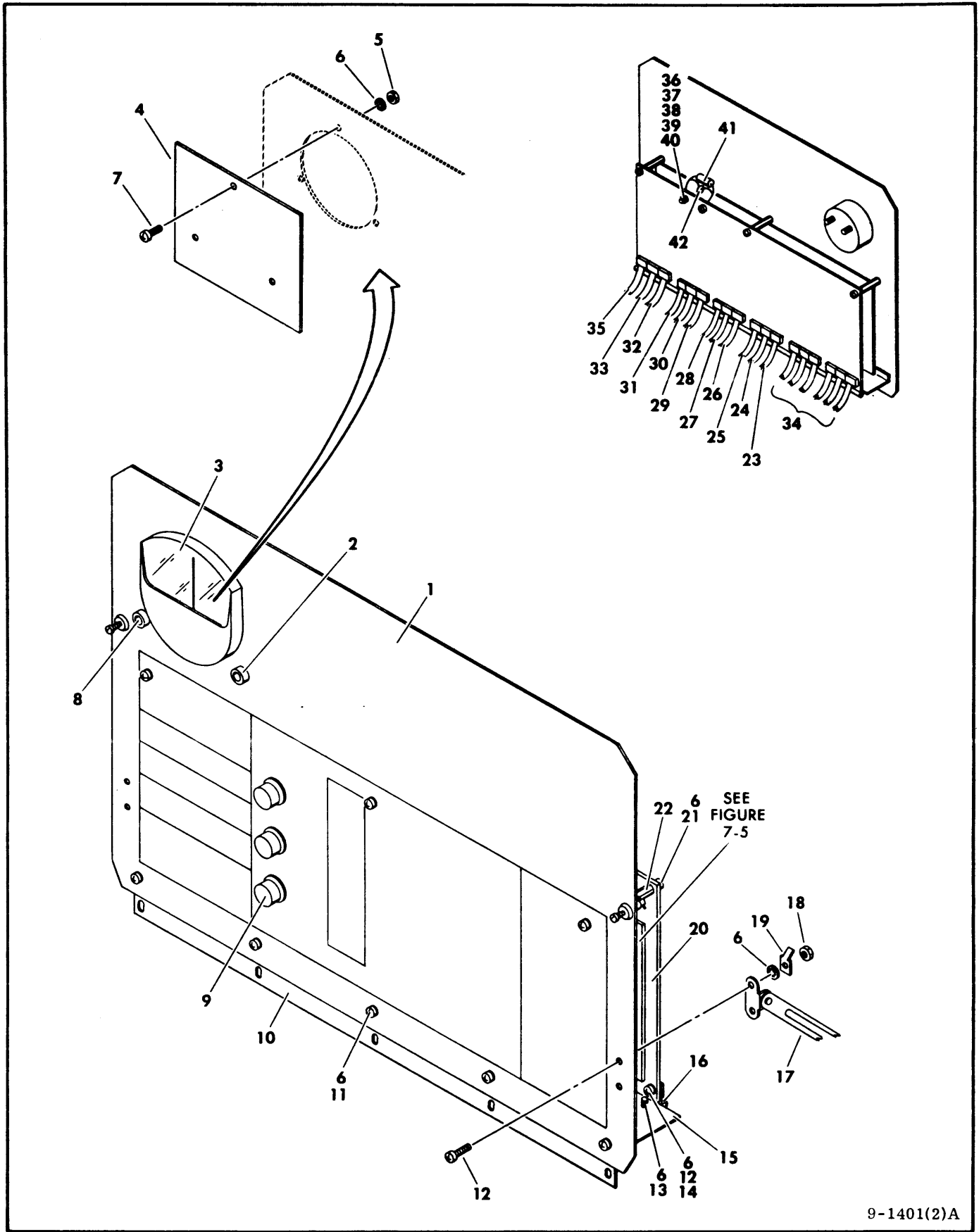


FIGURE 7-3. FINAL ASSEMBLY, RUGGEDIZED PACKAGE

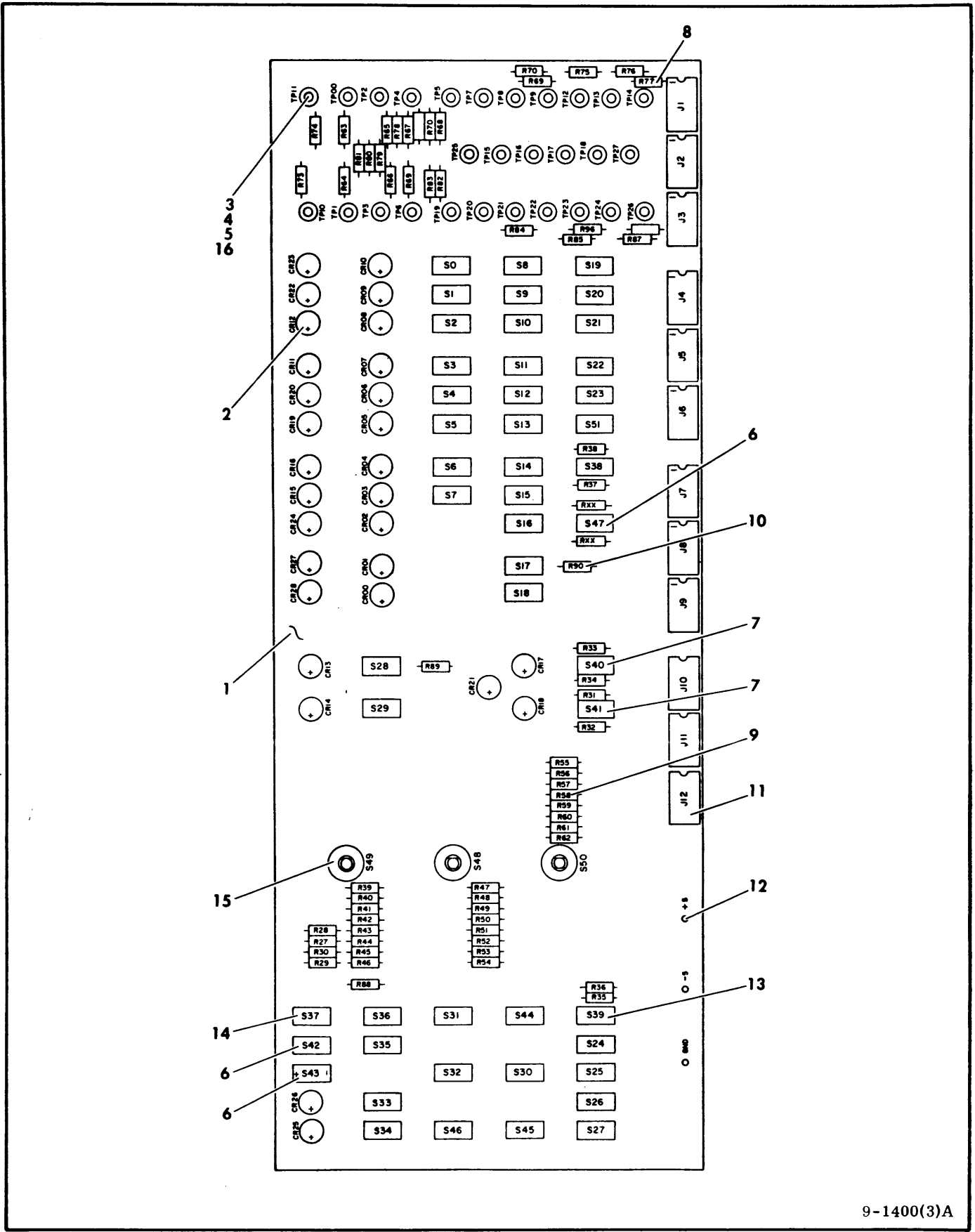
| INDEX NO. | PART NUMBER | PART DESCRIPTION | NOTES |
|-----------|-------------|--------------------------------------------|-----------------|
| 1- | 77449300 | FIELD TEST UNIT | TB304-A |
| 1- | 77449301 | FIELD TEST UNIT | TB304-B |
| 1- | 77449302 | FIELD TEST UNIT | TB304-C |
| 1 | 17901509 | SCREW, THRD ROLLING, PHILLIPS, 6-32 x 3/8 | |
| 2 | 83276500 | COVER, POWER SUPPLY | |
| 3 | 17901508 | SCREW, THRD ROLLING, PHILLIPS, 6-32 x 1/4 | |
| 4 | 46068603 | PLATE, WARNING | |
| 5 | 10125105 | NUT, HEX, MACHINE, 6-32 | |
| 6 | 10126103 | WASHER, LOCK, INT 6-TOOTH | |
| 7 | 10127113 | SCREW, PAN HD, PHILLIPS, 6-32 x 3/8 | |
| 8 | 24556501 | CONNECTOR | |
| 9 | 94308204 | CIRCUIT BREAKER | |
| 10 | 94348701 | GUARD, FAN, MINIATURE | |
| 11 | 94348700 | FAN, MINIATURE | |
| 12 | 10125803 | WASHER, SPRING LOCK, 6-TOOTH | |
| 13 | 92742179 | SCREW, PAN HD, PHILLIPS, 6-32 x 1 7/8 | |
| 14 | 94202502 | BUMPER, RUBBER | |
| 15 | 10125301 | NUT, HEX, 1/4-20 | |
| 16 | 10126404 | WASHER, LOCK, EXT TOOTH, 1/4 | |
| 17 | 94047086 | WASHER, SPECIAL | |
| 18 | 10127351 | SCREW, PAN HD, SLOT, 1/4-20 x 7/8 | |
| 19 | 10126600 | PLATE, EQUIP IDENT | |
| 20 | 72959300 | LABEL, FIELD CHANGE LOG | |
| 21 | 10127114 | SCREW, PAN HD, PHILLIPS, 6-32 x 1/2 | |
| 22 | 95510026 | NUT, HEX, MACH, 6-32 | |
| 23 | 94277421 | STRAP, CABLE TIE | |
| 24 | 10127154 | SCREW, PAN HD, PHILLIPS, 1/4-20 x 5/8 | |
| 25 | 92674005 | MOUNT, VIBRATION | |
| 26 | 10127111 | SCREW, PAN HD, PHILLIPS, 6-32 x 1/4 | |
| 27 | 83271800 | CASE, FIBERGLASS | |
| 28 | 94370400 | SUPPORT, LID, FRICTION | PE54023 |
| 29 | 10125714 | SCREW, FLT HD, CROSS-RECESSED, 6-32 x 3/8 | |
| 30 | 93570009 | RECEPTACLE | |
| 31 | 93643004 | CONNECTOR, CORNER GUIDE PIN | |
| 32 | 93643005 | CONNECTOR, CORNER GUIDE SOCKET | |
| 33 | 93642006 | CONNECTOR, JACK-SCREW, MALE | |
| 34 | 77453600 | I/O CABLE ASSY | |
| 35 | 93642007 | CONNECTOR, JACK-SCREW, FEMALE | |
| 36 | 10125106 | NUT, HEX, MACH, 8-32 | |
| 37 | 10127123 | SCREW, PAN HD, PHILLIPS, 8-32 x 1/2 | |
| 38 | 10125606 | WASHER, PLAIN, 8-TOOTH | |
| 39 | 10126402 | WASHER, LOCK, EXT 8-TOOTH | |
| 40 | 93041010 | STRIP, TERMINAL, BARRIER TYPE | |
| 41 | 93105110 | MARKER STRIP, TYPE A-16 TERM | |
| 42 | 77452100 | INTERCONNECTOR, CABLE ASSY | |
| 43 | 94370600 | POWER SUPPLY, 5V, 6A | |
| 44 | 94348402 | FILTER, R.F. | SC 06 AND BELOW |
| 44 | 94348403 | FILTER, R.F. | SC 07 AND ABOVE |
| 45 | 94368600 | POWER SUPPLY, 5V, 3A | |
| 46 | 83271300 | PLATE, BACK-UP | |
| 47 | 92509009 | SWITCH, TOGGLE | |
| 48 | 15012410 | BUSHING, SNAP-IN | |
| 49 | 10126401 | WASHER, LOCK, EXT 6-TOOTH | |
| 50 | 10127115 | SCREW, PAN HD, PHILLIPS, 6-32 x 5/8 | |
| 51 | 83271500 | COVER, CABLE | |
| 52 | 93994000 | RIVET | |
| 53 | 94060001 | CHANNEL, RUBBER, TYPE 1 | |
| 54 | 93573005 | STUD ASSY | |
| 55 | 93988000 | WASHER, RETAINING | |
| 56 | 77459900 | HOUSING, FTU | SC 06 AND BELOW |
| 56 | 47455600 | HOUSING, FTU | SC 07 AND ABOVE |
| | | FOR ASSEMBLIES NOT SHOWN, SEE PAGE 7-3. | |



9-1401(2)A

FIGURE 7-4. CONTROL PANEL, RUGGEDIZED PACKAGE

| INDEX NO. | PART NUMBER | PART DESCRIPTION | NOTES |
|-----------|-------------|-------------------------------------------|----------------|
| 1 | 83276300 | CONTROL PANEL, FTU | |
| 2 | 92183003 | JACK, BANANA, NYLON, RED | TB304 A/B ONLY |
| 3 | 94359700 | VOLTMETER, PANEL, D.C. | TB304 A/B ONLY |
| 4 | 77459800 | COVER, NULL METER | TB304 C ONLY |
| 5 | 10125105 | NUT, HEX, MACH, 6-32 | |
| 6 | 10126103 | WASHER, LOCK, INT 6-TOOTH | |
| 7 | 92748160 | SCREW, PAN HD, PHILLIPS, 6-32 x 5/16 | |
| 8 | 92183001 | JACK, BANANA, NYLON, BLACK | TB304 A/B ONLY |
| 9 | 93152009 | KNOB, SKIRTED | |
| 10 | 83276200 | HINGE, CONTROL PANEL | |
| 11 | 17901509 | SCREW, THRD ROLLING, PHILLIPS, 6-32 x 3/8 | |
| 12 | 10127113 | SCREW, PAN HD, PHILLIPS, 6-32 x 3/8 | |
| 13 | 17901508 | SCREW, THRD ROLLING, PHILLIPS, 6-32 x 1/4 | |
| 14 | 95510026 | NUT, HEX, MACH, 6-32 | |
| 15 | 83276900 | BRACKET, BOARD MOUNTING | |
| 16 | 76390800 | HINGE, IC BOARD | |
| 17 | 94370400 | SUPPORT, LID, FRICTION | PE54023 |
| 18 | 10125105 | NUT, HEX, MACH, 8-32 | |
| 19 | 94274106 | TERM., QUICK-CONNECT, TYPE 3 | |
| 20 | 774516XX | PANEL, LOGIC, WIRE WRAP ASSY | |
| 21 | 10127111 | SCREW, PAN HD, PHILLIPS, 6-32 x 1/4 | |
| 22 | 93114221 | STANDOFF, TAPPED POST, HEX, ALUM. | |
| 23 | 77452111 | INTERCONNECT CABLE ASSY | |
| 24 | 77452110 | INTERCONNECT CABLE ASSY | |
| 25 | 77452109 | INTERCONNECT CABLE ASSY | |
| 26 | 77452108 | INTERCONNECT CABLE ASSY | |
| 27 | 77452107 | INTERCONNECT CABLE ASSY | |
| 28 | 77452106 | INTERCONNECT CABLE ASSY | |
| 29 | 77452105 | INTERCONNECT CABLE ASSY | |
| 30 | 77452104 | INTERCONNECT CABLE ASSY | |
| 31 | 77452103 | INTERCONNECT CABLE ASSY | |
| 32 | 77452102 | INTERCONNECT CABLE ASSY | |
| 33 | 77452101 | INTERCONNECT CABLE ASSY | |
| 34 | 77453600 | I/O CABLE ASSY (SEE FIGURE 7-3) | |
| 35 | 77452100 | INTERCONNECT CABLE ASSY | |
| 36 | 93541010 | TERM., RING TONGUE, INSULATED | |
| 37 | 10127104 | SCREW, PAN HD, PHILLIPS, 4-40 x 3/8 | |
| 38 | 93564004 | WASHER, NYLON | |
| 39 | 10126400 | WASHER, LOCK, EXT 4-TOOTH | |
| 40 | 10125103 | NUT, HEX, MACH, 4-40 | |
| 41 | 92427039 | CAPACITOR, ELECTRO, 55 V, 6.8 μ F | |
| 42 | 51001119 | CAP, NON-ELECTRO, 25 V, 10 000 pF | |



9-1400(3)A

FIGURE 7-5. COMPONENT ASSEMBLY, 5VKN

| INDEX NO. | PART NUMBER | PART DESCRIPTION | NOTES |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------|----------------------|
| 3- | | FTU | |
| 1 | 77449800 | TYPE 5VKN COMPONENT ASSY | |
| 2 | 77449700 | TYPE 5VKN BOARD, BLANK | |
| 3 | 94367113 | L.E.D. LENS, DIFFUSED | |
| 4 | 94363100 | STANDOFF, THREADED, SWAGED | |
| 5 | 95644206 | BUSHING, INSULATING | |
| 6 | 94390300 | CONDUCTOR, NON-INSULATED | |
| 7 | 94263900 | SWITCH, TOGGLE, 3-POSITION: LOCKING UP/ DOWN, CENTER OFF | QTY: 3 |
| 8 | 94263903 | SWITCH, TOGGLE, 3-POS MOMENTARY, CENTER OFF | QTY: 2 |
| 9 | 92512153 | RESISTOR, 1/4 W, 100 OHMS | QTY: 27 (SEE NOTE 1) |
| 10 | 92512258 | RESISTOR, 1/4 W, 3.9K OHMS | QTY: 36 (SEE NOTE 1) |
| 11 | 92512158 | RESISTOR, 1/4 W, 1K OHMS | QTY: 2 (SEE NOTE 1) |
| 12 | 94260300 | SOCKET, IC, 14-PIN | |
| 13 | 93640022 | STUD, SELF-CLINCHING | |
| 14 | 94263904 | SWITCH, TOGGLE, 3-POS: LOCKING UP, MOMENTARY DOWN, CENTER OFF | |
| 15 | 94263901 | SWITCH, TOGGLE, SPDT | QTY: 43 (SEE NOTE 2) |
| 16 | 94370801 | SWITCH, ROTARY, 10-POSITION | QTY: 3 |
| | 10125103 | NUT, HEX, MACHINE, 4-40 | |
| NOTES | | | |
| <p>1. TO REPLACE RESISTORS (INDEX NO'S 8,9,10), SEE CR301 THROUGH CR305 IN DIAGRAMS SECTION FOR RESISTANCE VALUE AND R-NUMBER, THEN REFER TO FIGURE 7-5 FOR LOCATION.</p> | | | |
| <p>2. ALL TOGGLE SWITCHES NOT IDENTIFIED BY INDEX NUMBERS ARE INDEX NO. 14.</p> | | | |

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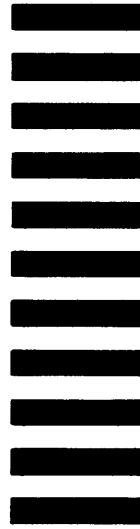
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