60475540

CONTROL DATA CORPORATION

CDC® I/O EXPANSION SUBSYSTEM

AT314, AU115, BU272, CW218

GENERAL DESCRIPTION
OPERATION
INSTALLATION AND CHECKOUT
THEORY OF OPERATION
DIAGRAMS
MAINTENANCE
PARTS DATA
WIRE LISTS

HARDWARE REFERENCE/MAINTENANCE MANUAL

REVISION RECORD

REVISION	DESCRIPTION
01	Preliminary version
(4/79)	
A	Manual released class A. This manual supersedes all previous editions and publications 60475550 and 60475560, which were
(5/81)	not officially released.
B	Manual revised; includes ECO DS022092, providing a revised IOX finalization kit drawing.
(8/81)	
C	Manual revised; includes ECO DS022212, providing improved door installation instructions and an FCC tested/complies
(12/82)	warning label.

Publication No.
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or use Comment Sheet in the back of this manual.

MANUAL TO EQUIPMENT LEVEL CORRELATION SHEET

This manual reflects the equipment configurations listed below.

EXPLANATION: Locate the equipment type and series number, as shown on the equipment FCO log, in the list below. Immediately to the right of the series number is an FCO number. If that number and all of the numbers underneath it match all of the numbers on the equipment FCO log, then this manual accurately reflects the equipment.

EQUIPMENT TYPE	SERIES	WITH FCOs	COMMENTS
AT314-A	01		AQ Extender
AT314-B	01		
AT314-C	01		
AT314-D	01		
AT314-E	01		
AU115-A	01		Dual Mode Access Unit
BU272-A	01		DMA Extender
CW218-A	01		I/O Expansion Unit
	02		
	03		
	04		
	05		
	06		

LIST OF EFFECTIVE PAGES

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PREFACE

This manual describes the CONTROL DATA® CW218 I/O expansion unit, AT314 AQ extender, BU272 DMA extender, and AU115 dual mode access units. These units provide transparent expansion of the CYBER 18 AQ and DMA control and data buses, which allows inclusion of up to eight additional AQ or DMA controllers of any mix. Information contained in this manual is intended for the use of field service personnel.

The I/O expansion subsystem contains a microprocessor that is controlled by a firmware program. The firmware description and listing are contained in the firmware specifications listed below.

The following Control Data publications may be useful in installing and maintaining the I/O expansion units.

Publication	Publication Number
CYBER 18 Equipment Cabinets Hardware Reference/Maintenance Manual	96768280
CYBER 18 Computer Systems with MOS Memory Installation Manual	96768360
Buffered Communication Line Adapter Field Repair Guide	60475130
Firmware Specification for PROM Program Patterns of DMAX Controller	96750961
Operational Diagnostic System (ODS) Version 2 Reference Manual	96768410
AT314-A Master Field Print Package	96751500
AT314-B Master Field Print Package	96720078

WARNING

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference with radio communications. It has been tested to comply with the limits for Class A peripheral computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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GENERAL DESCRIPTION 1

This manual describes the I/O expansion subsystem which comprises the I/O expansion (CW218), AQ extender (AT314), DMA extender (BU272), and dual mode access (AU115) units. These units provide transparent expansion of the CYBER 18 AQ and DMA control and data buses to provide up to eight additional AQ or eight additional DMA controllers. This manual does not describe the operation of the CPU.

The I/O expansion unit also includes a wired I/O expansion chassis, a four-output power supply, and a 136-position RS232-C connector mounting panel (figure 1-1) to support communication controllers in the expansion chassis.

Each extender unit (AQ or DMA) includes a pair of identical printed wiring assemblies (PWAs), two paddle boards, and connecting cables (figure 1-2). One PWA of each extender unit pair occupies a slot in the CPU (slot AA for the AQX and slot A for the DMAX) and the other PWA of each extender unit pair occupies a slot in the I/O expansion chassis (slots Z or AC for the AQX and slots AA or AB for the DMAX). The terms AQX and DMAX refer to the AQ extender and DMA extender PWAs respectively.

PHYSICAL DESCRIPTION

I/O EXPANSION UNIT

Hardware for the I/O expansion unit includes a wired I/O expansion chassis, a four-output power supply, and a 136-position RS232-C connector mounting panel to accommodate interface of communication controllers in the expansion chassis. The connector panel mounts on the vertical rails in the lower rear half of the cabinet. The subsystem construction is documented for a GH447 rack. The subsystem can also be mounted in any vertical cabinet that has standard 19-inch (483-millimeter) RETMA mounting rails (this construction is not documented). Configuration of the I/O expansion unit permits single processor (figure 1-2) and dual processor (figure 1-3) expansion.

I/O Expansion Chassis

The I/O expansion chassis is 18.5 inches high by 17.75 inches wide by 12.0 inches deep (470 by 451 by 305 millimeters). The chassis includes cooling fans and a front cover (figure 1-4) to aid cooling and increase electro-magnetic noise immunity. The chassis contains 26 card slots, each 0.625 inches (16 millimeters) wide, which accommodate standard 11- by 14-inch (279- by 356-millimeter) CYBER 18 peripheral controllers.

Terminator

The terminator consists of a cable connector, five resistors, and one capacitor (figure 1-1). The resistors and capacitor are connected across pins of the connector to provide proper line termination of various DMA control signals.

Power Supply

The power supply (figure 1-5) provides four different voltage and current outputs to the I/O expansion chassis backpanel. The power supply measures 7 inches wide, 5.1 inches high, and 11.75 inches long (178 millimeters by 130 millimeters by 299 millimeters respectively). The connection panel contains terminal strips for connecting to the low current voltage outputs and threaded stud terminals for connecting to the high current voltage output and chassis ground: Elongated holes above and below the terminal strips provide access to the output voltage adjusting screws. The power supply is furnished with a mounting bracket to facilitate attachment to the cabinet side wall frame.

Connector Mounting Panels

The I/O expansion subsystem includes four connector mounting panels (figure 1-6) that provide attachment of 136 peripheral controller interface cable connectors. These panels are attached to the cabinet rear vertical mounting brackets that are immediately below the power distribution box.

DUAL-MODE ACCESS

The dual-mode access hardware provides assemblies to facilitate installation of the I/O expansion subsystem into a dual CPU system configuration. The dual mode access equipment consists of one 50-foot (15-meter) dual access cable and, one switch box assembly with two 25-foot (7.5-meter) single twisted pair cables. The switch box (figure 1-7) measures 3 inches high, 2.12 inches wide, and 1 inch deep (76 millimeters by 54 millimeters by 25 millimeters respectively). The switch box assembly cables connect the local AQ paddle board located in each CPU. The dual-access cable connects between the two local A/Q paddle boards.

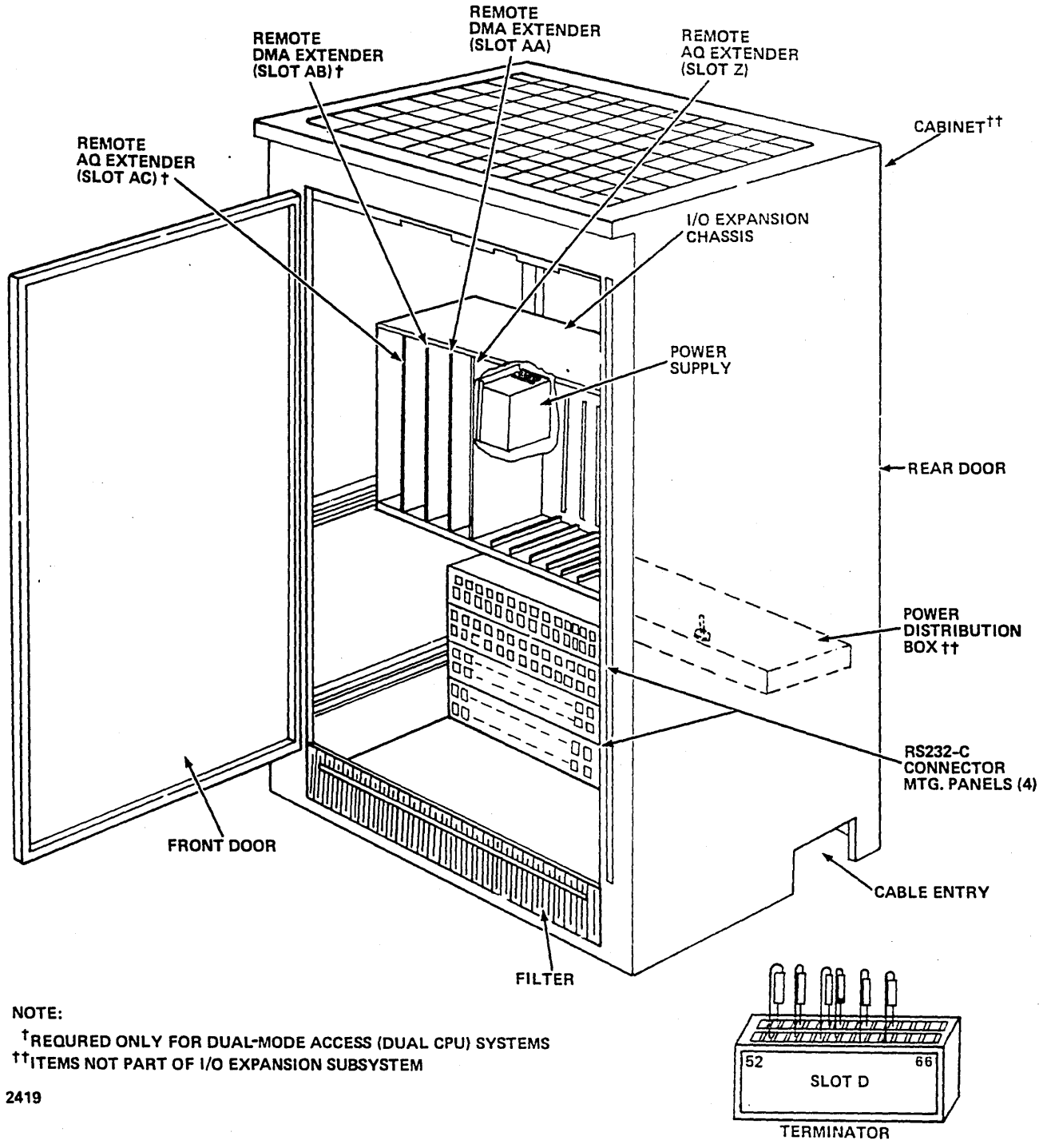


Figure 1-1. I/O Expansion Subsystem (Sheet 1 of 2)

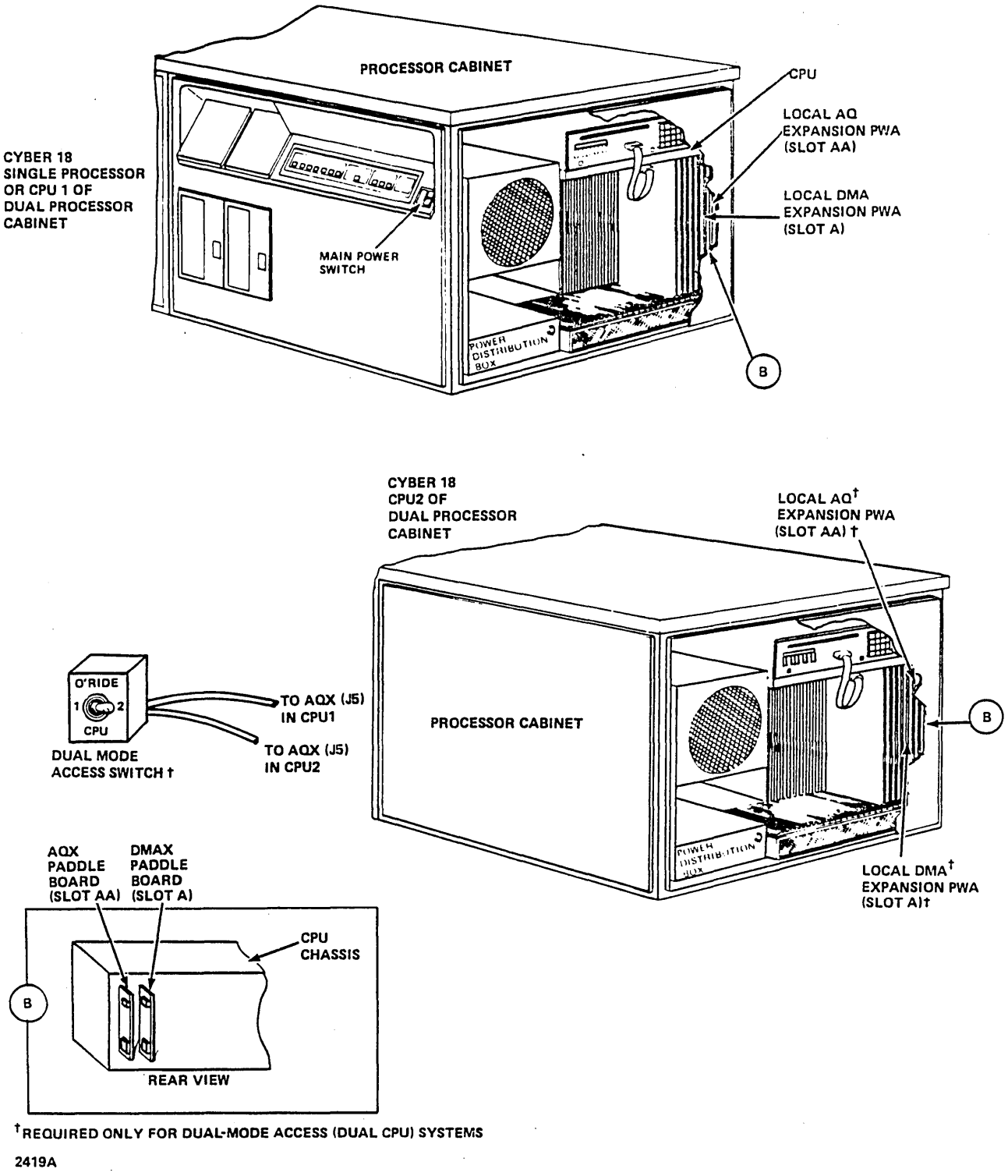


Figure 1-1. I/O Expansion Subsystem (Sheet 2 of 2)

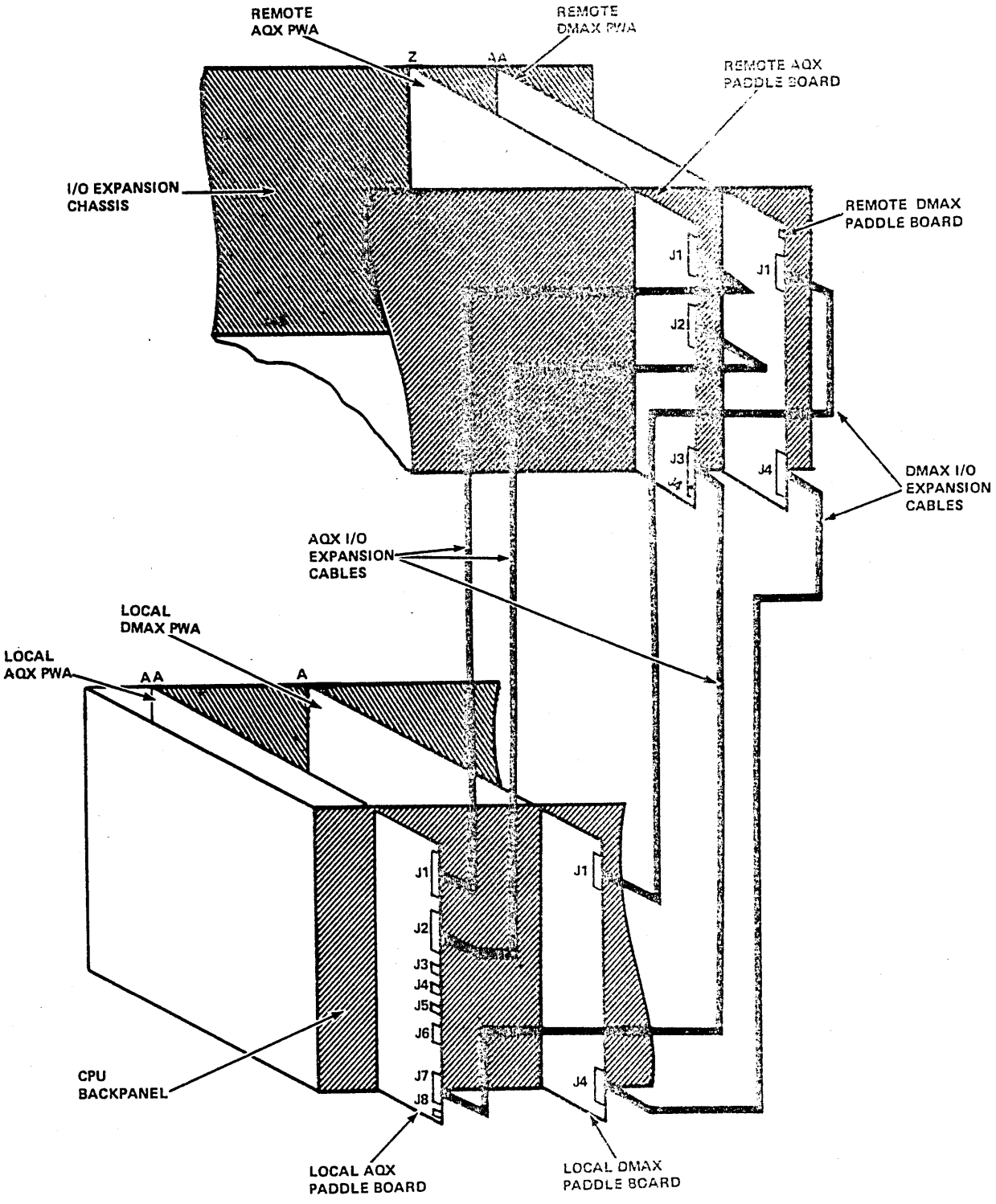
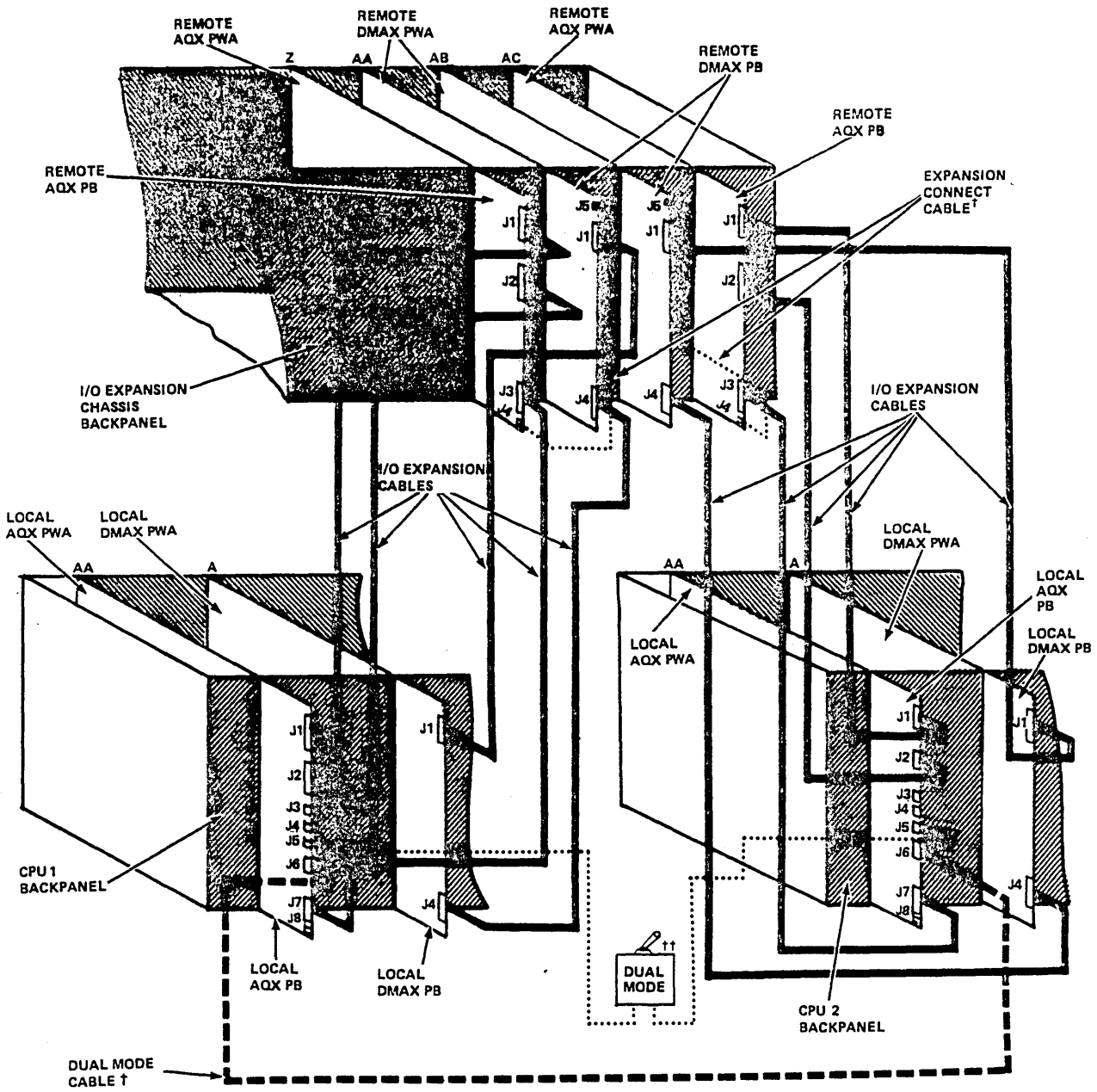


Figure 1-2. Single Access Configuration



†USED IN DUAL MODE ACCESS ONLY

††DUAL MODE ACCESS SWITCH BOX

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Figure 1-3. Dual Mode Access Configuration

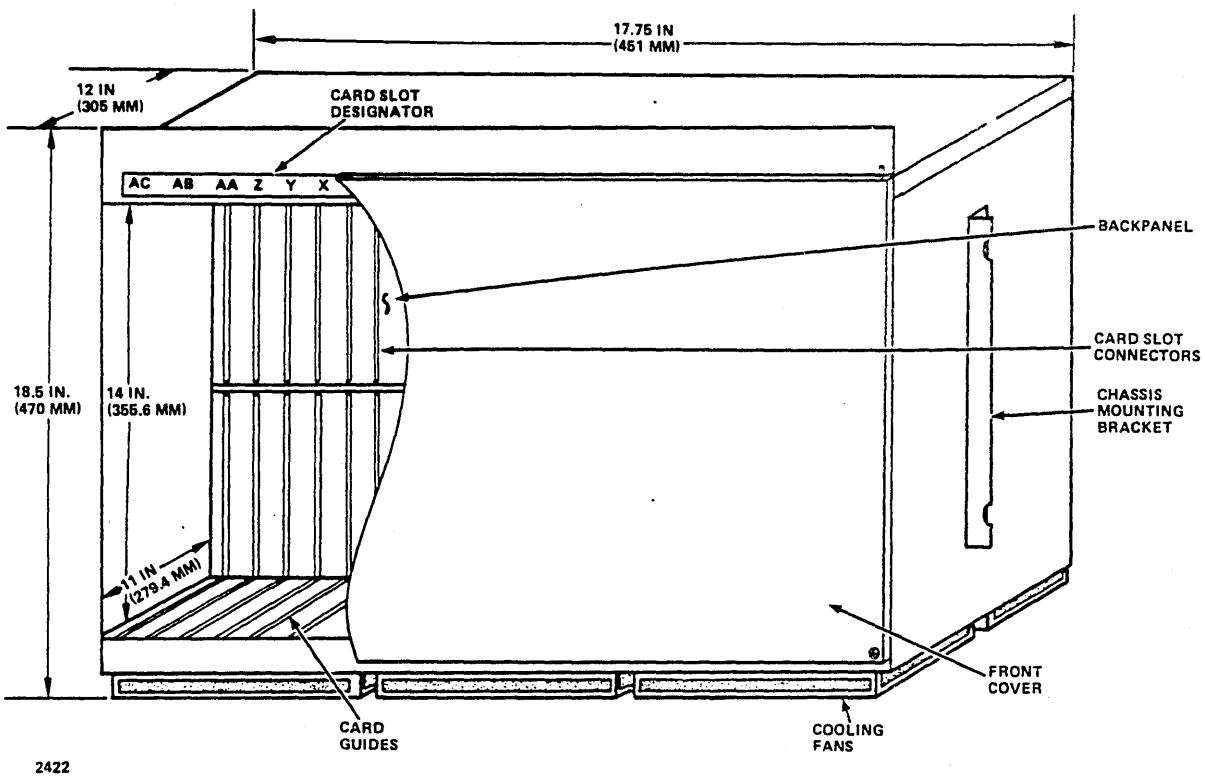


Figure 1-4. I/O Expansion Chassis

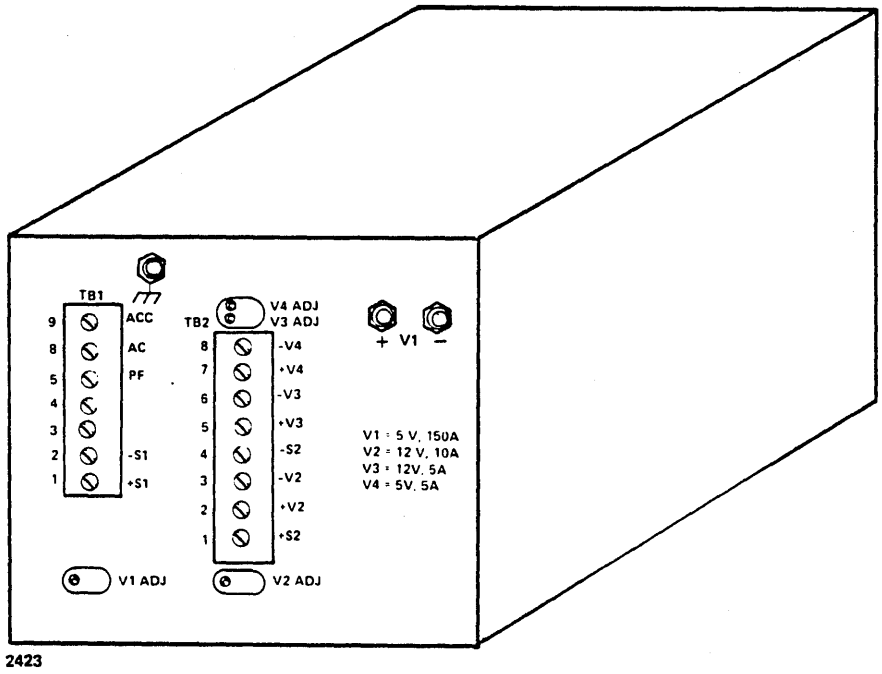


Figure 1-5. Four Output Power Supply

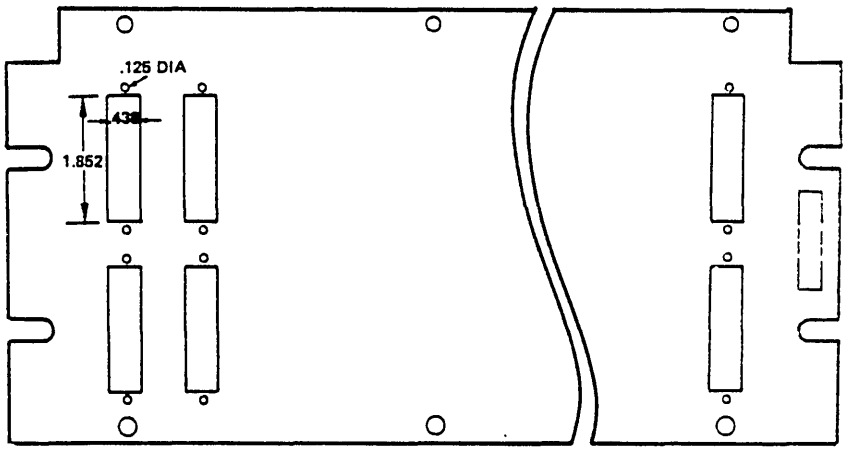


Figure 1-6. Connector Mounting Panel (One of Four)

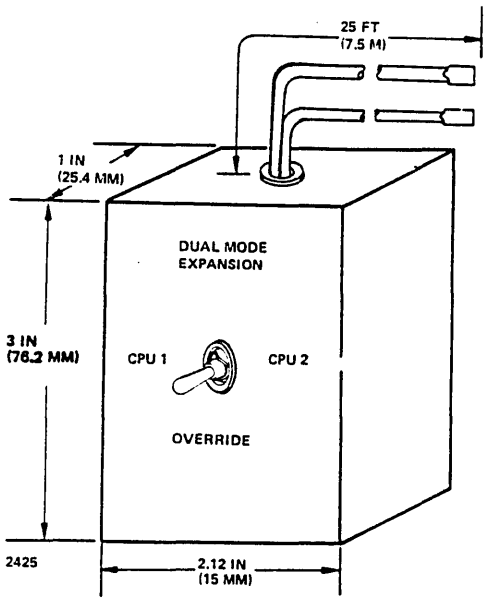


Figure 1-7. Dual Mode Access Switch

AQ EXTENDER

The AQ extender unit consists of two identical PWAS (figure 1-8); each measuring 11 by 14 inches (279 by 356 millimeters); two paddle boards (local and remote, figure 1-9), each measuring 2.25 by 14 inches (57 by 356 millimeters); and three identical I/O expansion cables 50 feet (15 meters) long. One PWA occupies slot AA in the CPU, and the other PWA occupies slot Z or AC in the I/O expansion chassis. The local and remote paddle boards are different assemblies due to the different termination requirements. The local paddle board is plugged onto the AQ extender slot connector of the CPU backpanel. The remote paddle board is plugged onto the AQ extender slot connector of the I/O expansion chassis backpanel. These paddle boards provide required termination resistor networks for interface signal lines.

The three shielded I/O expansion cables are identical 1 to 1, 48-conductor (24 twisted pairs) cables that are terminated at both ends into a 50-pin (2 rows of 25 pins) connector housing. The cable connector housing and the paddle board connectors are keyed to prevent installing the connectors upside down. All signal lines are twisted with ground. The I/O expansion cables, when connected between I/O connectors on the AQ paddle boards, provide AQ signal line interface between the CPU and expansion chassis.

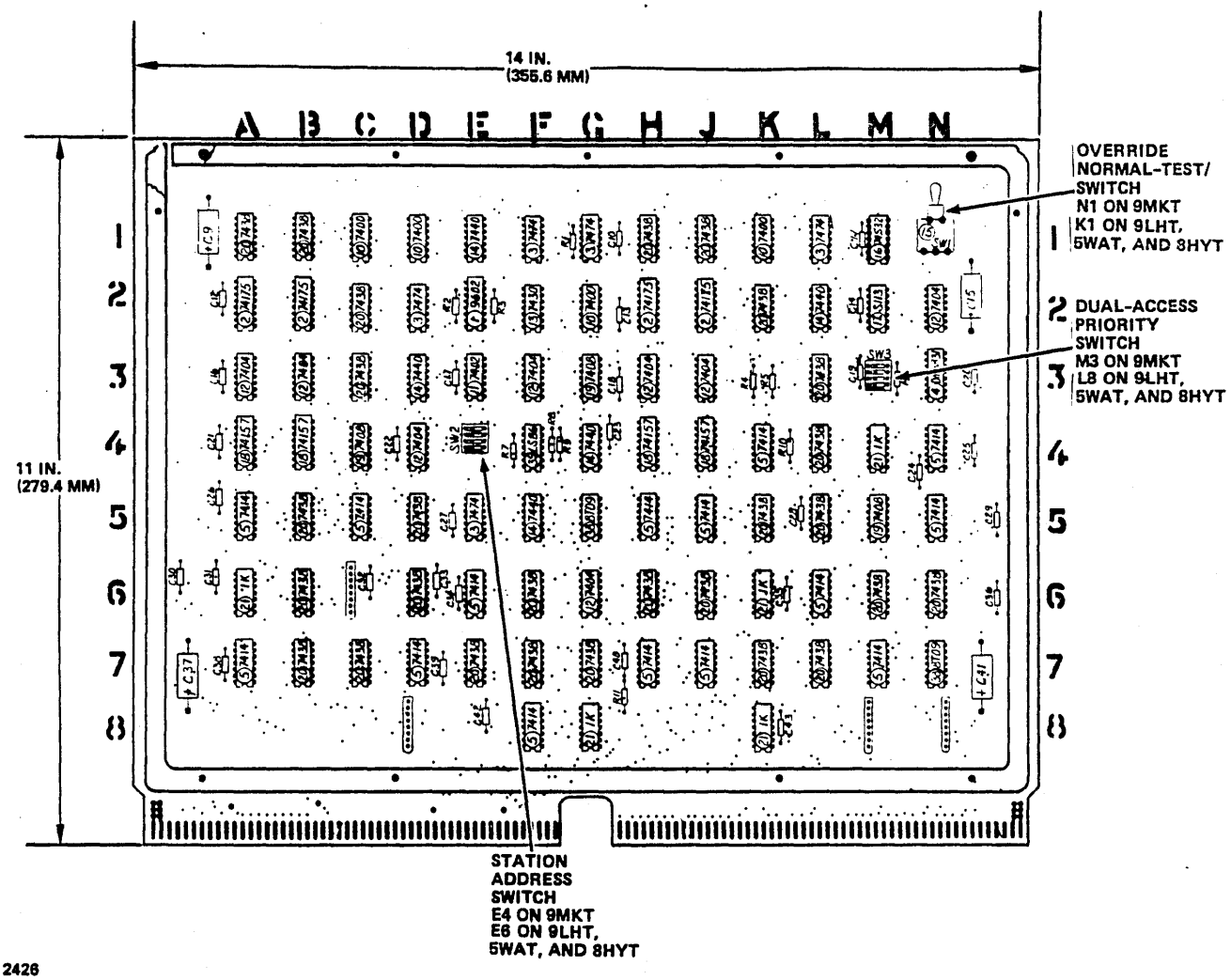


Figure 1-8. AQ Extender PWA

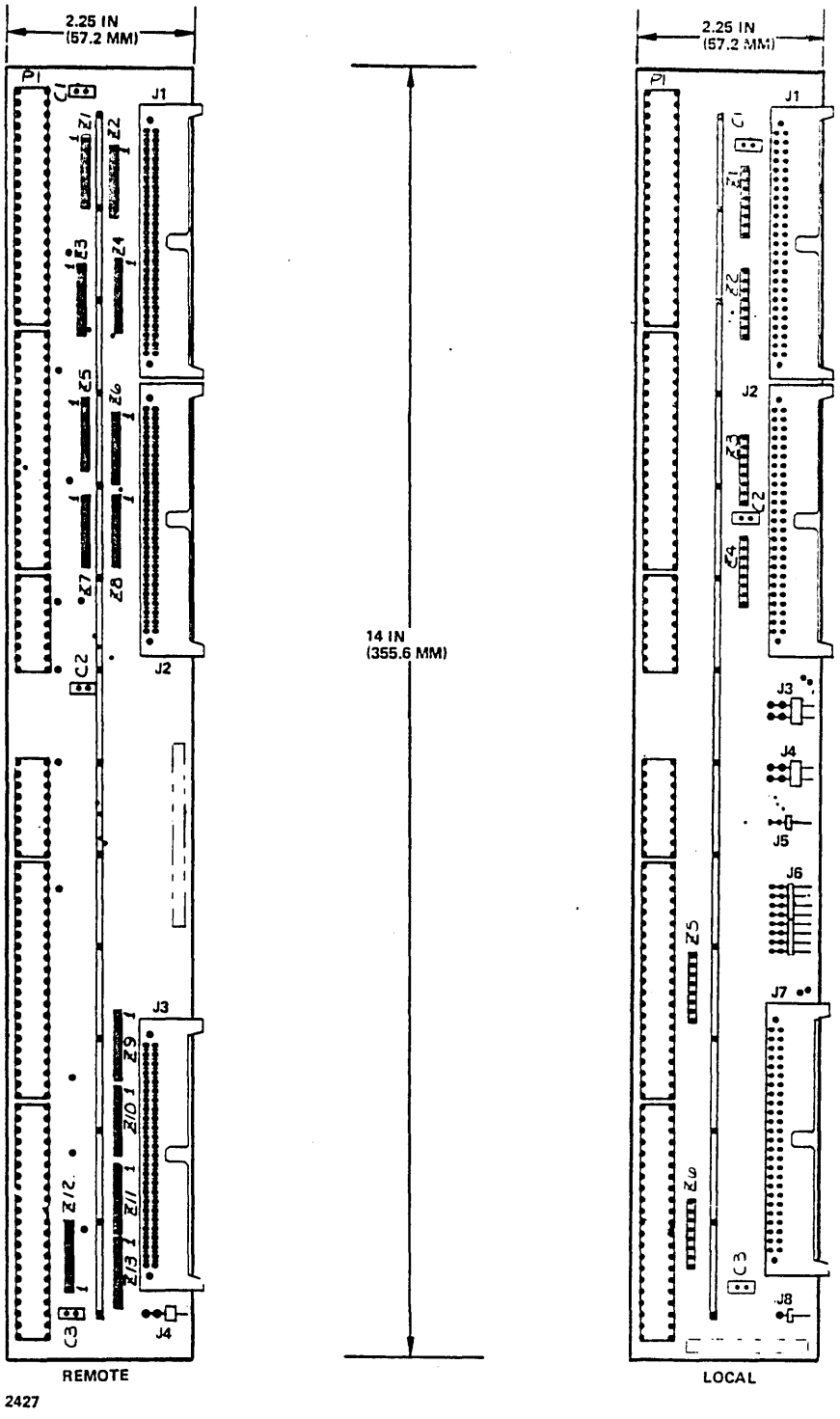


Figure 1-9. AQX Paddle Boards

DMA EXTENDER

The DMA extender unit consists of two identical PWAs (figure 1-10), each measuring 11 by 14 inches (279 by 356 millimeters); two paddle boards (local and remote, figure 1-11), each measures 2.25 by 14 inches (57 by 356 millimeters); two identical I/O expansion cables 50 feet (15 meters) long; and 1 expansion connect cable. One PWA occupies AQ-DMA slot A in the CPU, and the other occupies slot AA or AB in the expansion chassis. The local and remote paddle boards are different assemblies due to the different termination requirements. The local paddle board is plugged onto the DMA extender slot connector of the CPU backpanel, and the remote paddle board is plugged onto the DMA extender slot connector of the I/O expansion chassis backpanel. These paddle boards provide required termination resistor networks for interface signal lines.

The two shielded I/O expansion cables that are identical 1 to 1, 48-conductor (24 twisted pairs) cables are terminated at both ends into a 50 pin (2 rows of 25 pins) connector housing. The cable connector housing and the paddle board connectors are keyed to prevent installing the connectors upside down. All signal lines are twisted with ground. The I/O expansion cables when connected between I/O connectors on the DMA paddle boards provide DMA signal line interface between the CPU and expansion chassis.

The DMA extender hardware includes a 16-inch (406-millimeter) single twisted pair cable. This cable is only used in dual CPU system configurations. The cable attaches between the remote DMA and AQ extender paddle boards located in the I/O expansion chassis.

FUNCTIONAL DESCRIPTION

I/O EXPANSION CHASSIS

The expansion chassis provides eight AQ, eight DMA, and four open slots. In order to expand the standard CYBER 18 processor AQ and DMA busses to the I/O expansion chassis, an AQ extender unit and a DMA extender unit are required for a single CPU configuration (figure 1-12). For a dual processor configuration, two AQ extender units and two DMA extender units are required plus a dual mode access switch.

Figure 1-13 details the card placement for the I/O expansion chassis. Slots AC and Z are wired for AQ extenders. Slots AA and AB are wired for DMA extenders. Slot Y is dedicated as an interrupt termination slot to facilitate interrupt connections using an interrupt jumper cable assembly.

The AQ and DMA buses are recreated in the I/O expansion chassis via the AQ and DMA extenders. Deadstart and M05 operation are not supported in the expansion chassis. The module drive subsystem is also not supported in the expansion chassis due to transfer rate restrictions. The basic functions of the expansion chassis are to house the AQ and DMA extender boards and the additional peripheral controller boards, as well as to distribute dc power supply voltages to these controller boards via the backplane. The chassis contains no active logic; therefore, it has no performance or functional limitations by itself.

AQ EXTENDER

The AQ extender unit provides the extension of the CPU AQ-I/O bus to the I/O expansion chassis. The signal pin-outs in the expansion chassis permit use of all A/Q devices, but not deadstart capability. The AQ extender unit provides the capability for two separate CPUs to communicate with AQ peripheral devices via the AQ peripheral controller in the expansion chassis. Dual CPU operation is based on the selection of the expanded bus by manual override feature which places only one CPU on the bus at a time.

The AQ extender unit is basically a transparent device in operation. The I/O signals from and to the CPU and expansion cahssis are transmitted through the AQ extender unit without change. Signals are delayed 300 nanoseconds due to circuit and cable propagation times.

DMA EXTENDER

The DMA extender unit provides the extension of the CPU DMA buses (data, address, and control) to the I/O expansion chassis. The signal pin-outs in the expansion chassis permit use of all low-speed (350 K words per second maximum) DMA devices. The DMA extender unit provides the capability for two separate CPUs to communicate with DMA devices via the DMA peripheral controller in the expansion chassis.

As a component of the I/O expansion (IOX) the DMA extender provides the following features:

- DMA expansion to a maximum of eight DMA interfaces located in the expansion chassis. This provides an eight-to-one prioritized memory request bus.
- Dual CPU access to the expansion DMA bus.
- Parity generation/check on all DMA transfers between the processor and the I/O expansion. Separate parity checks occur on data, address, and steady state control buses.
- At least one retry on transmit parity errors. Continuous retries or abort after single retry may be selected by AQ program control.
- A software maskable, eight-to-one interrupt multiplexer at the expansion chassis, allowing parallel status sensing of the eight interrupt lines.
- A total DMA bandwidth at the I/O expansion of approximately 350,000 words per second.

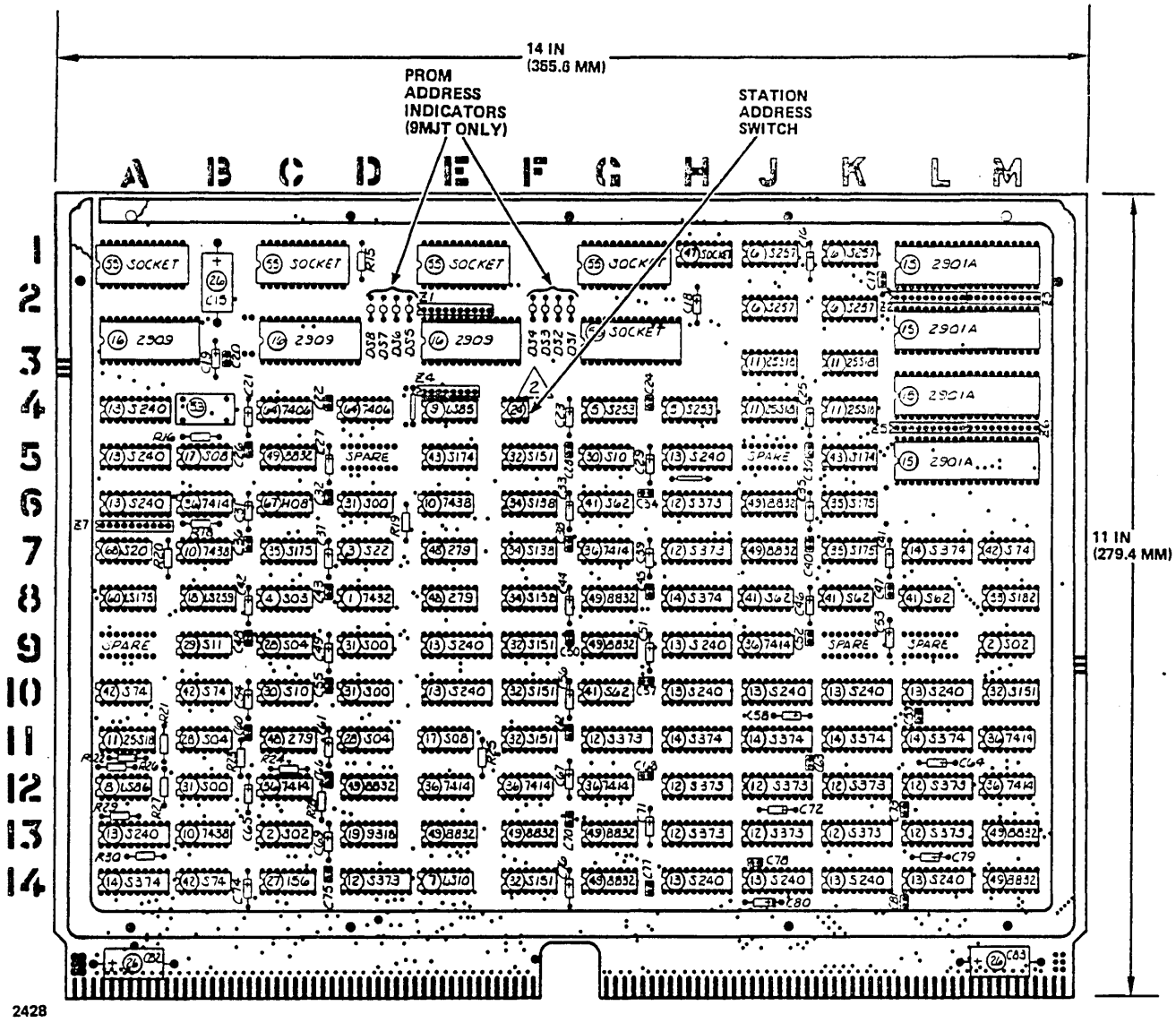


Figure 1-10. DMA Extender PWA

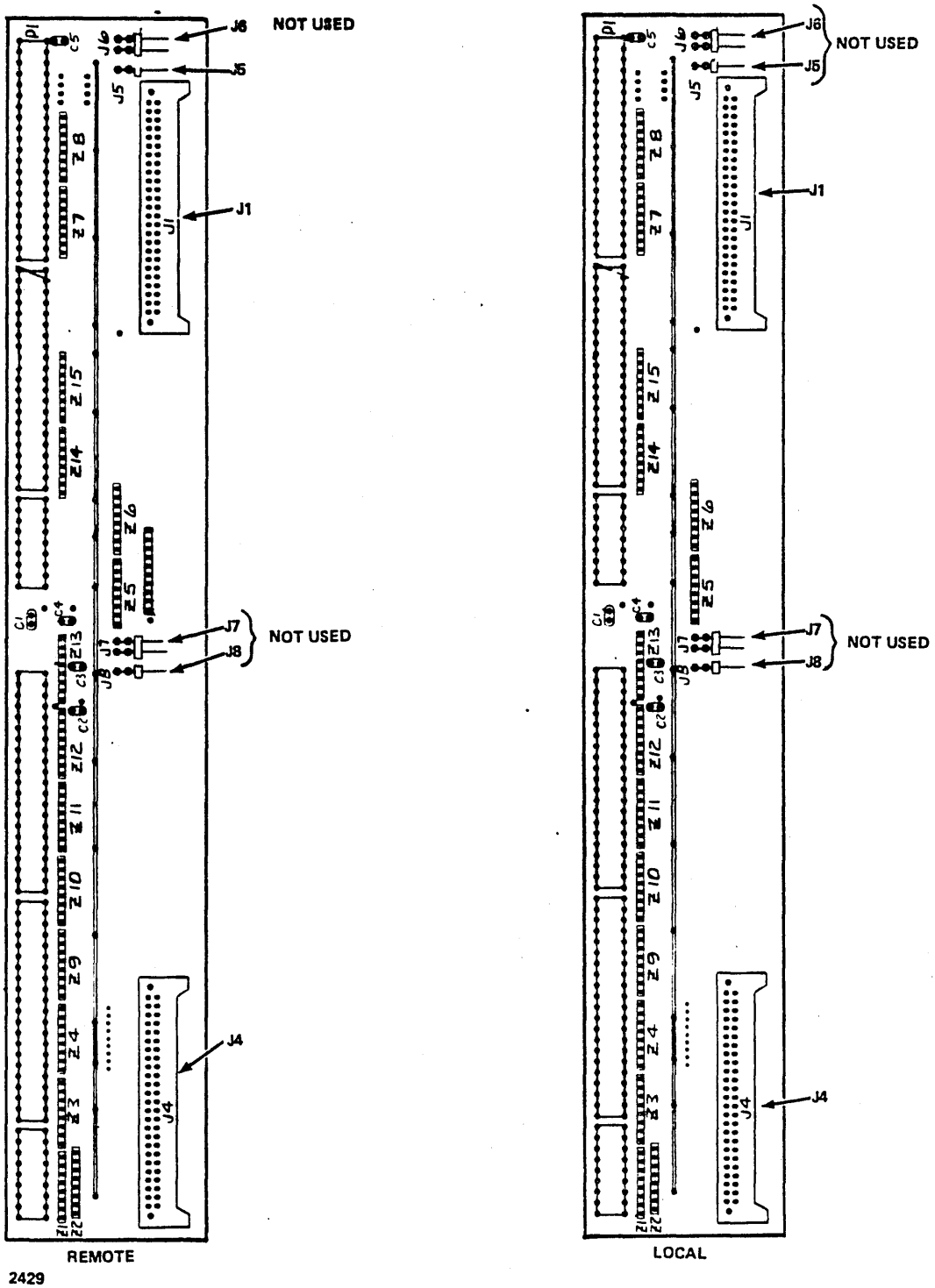


Figure 1-11. DMAX Paddle Boards

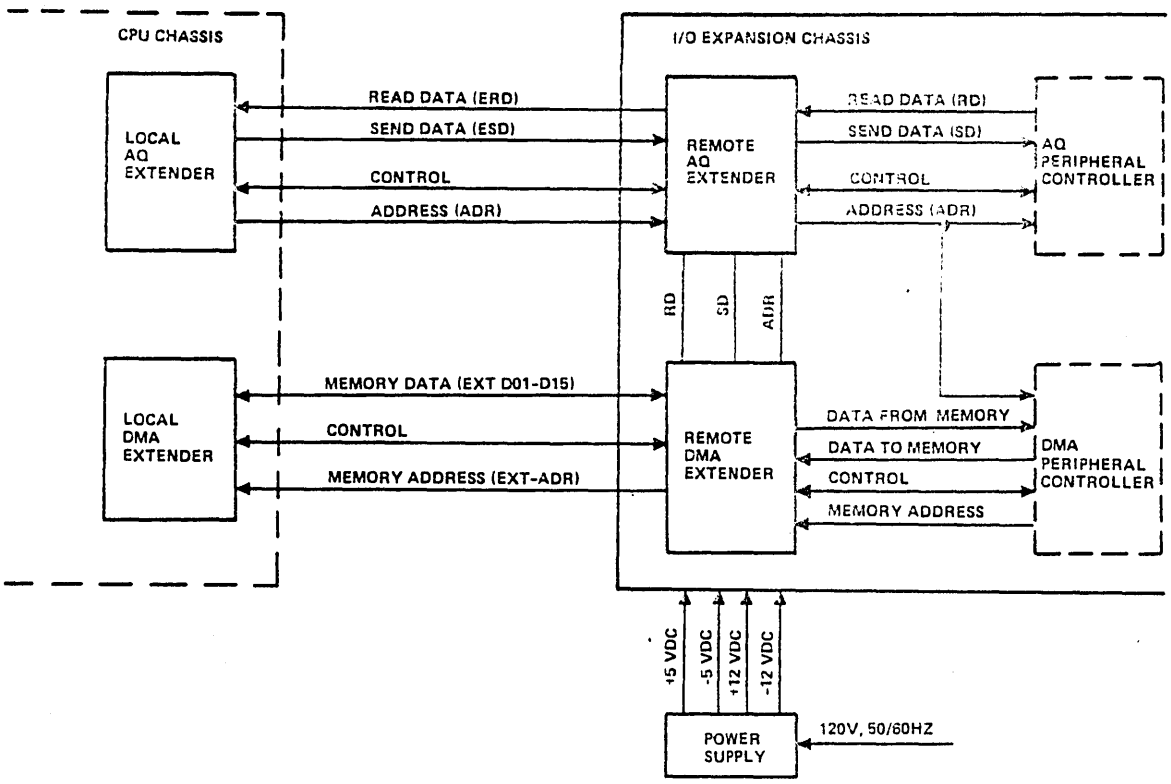


Figure 1-12. I/O Expansion Subsystem Block Diagram

AC	AB	AA	Z	Y	X	W	V	U	T	S	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
CPU2 AQ EXTENDER	CPU2 DMA EXTENDER	CPU1 DMA EXTENDER	CPU1 AQ EXTENDER	INTERRUPT TERMINATION	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA	AQ	AQ/DMA		OPEN	OPEN	OPEN	OPEN
AT314	BU272	BU272	AT314																						

Figure 1-13. I/O Expansion Chassis Slot Assignment

ENVIRONMENTAL

The I/O expansion subsystem operates in the same environment as the CYBER 18 processor family. The I/O expansion subsystem performs satisfactorily over a temperature range of 40° to 120°F (5° to 50°C) and a relative humidity range of 10 to 90 percent (non-condensation).

PROCESSING RATE

AQ EXTENDER

The AQ extender transmission rate through the extender unit is determinated by the transfer rate of the CPU. Signals may be delayed 300 nanoseconds, worst case, due to circuit and I/O cable propagation times.

DMA EXTENDER

The DMA extender operational performance provides a DMA transfer rate of error-free memory accesses of 350K words per second maximum when transferring to or from an idle memory bus.

POWER

Each extender unit PWA requires +5 V at 5.0 amperes maximum. The power is obtained from the chassis in which the extender resides. Power is also provided to the paddle boards for termination resistor networks. The power supply meets the requirements of the CDC standard for equipment safety. It is a recognized acceptable component per - UL standard (UL478) and CSA standard (C22).

LOGIC CIRCUITS

The AQ and DMA extenders both utilize 7400 series SSI and MSI transistor-transistor logic. The DMA extender also utilizes Bi-polar LSI logic.

CONTROL AND WIRING

Refer to the equipment cabinet hardware reference/ maintenance manual listed in the preface for power distribution information applicable to vertical cabinets in which the I/O expansion unit may be installed.

This section contains information necessary to operate and program the I/O expansion subsystem.

OPERATION

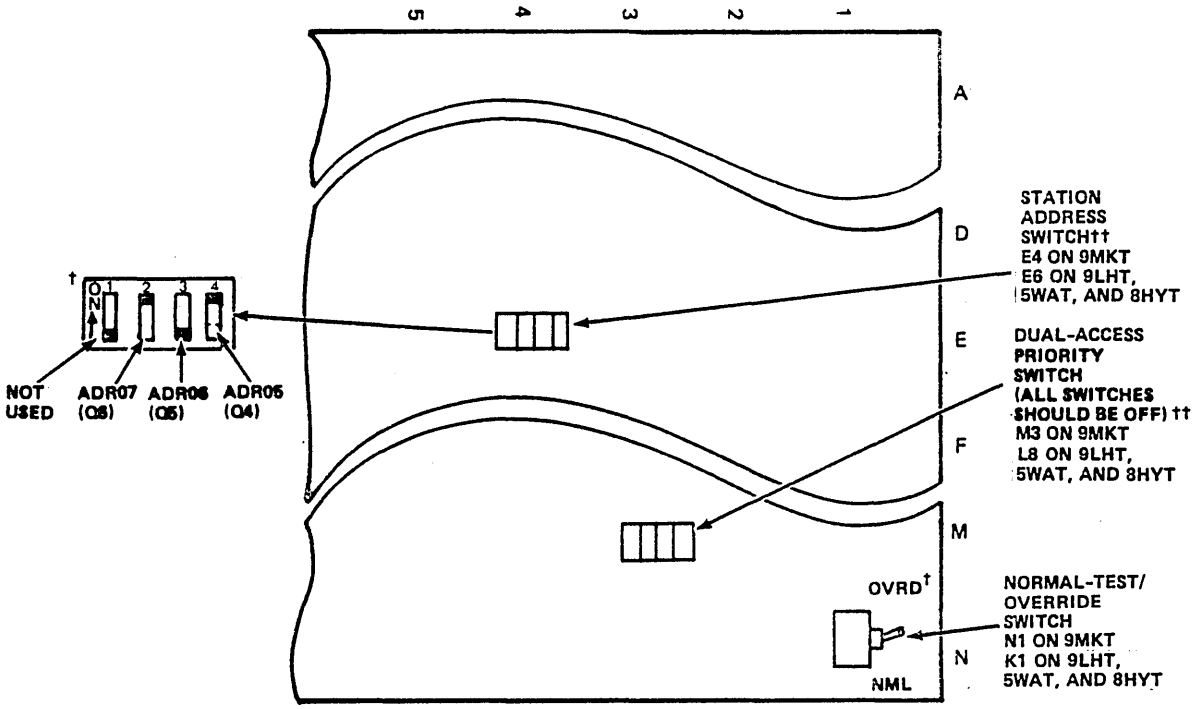
CONTROLS AND INDICATORS

All I/O expansion subsystem controls are located on the AQ extender PWA, DMA extender PWA, and dual mode access switch. The dual mode access switch is supplied only when the I/O expansion subsystem is configured to operate with two CPUs.

AQ Extender PWA

The AQ extender PWA (figure 2-1) contains two DIP (dual inline package) switch assemblies and one toggle switch. Both DIP switch assemblies contain four slide switches. One switch selects station address (location E4) and the other switch selects operational priority (location M3). The station address switch contains four slide switches of which three are active. The three active switches are exclusively ORed with Q-register bits 4 through 6. The switch places one input of the associated exclusive OR at ground when the switch is closed.

The dual-access priority switch is used for special applications that are not supported by this manual.



†STANDARD CYBER 18 SETTING FOR SINGLE CPU SYSTEM
††ON = GND (LOGIC 1)
OFF = +5 V (LOGIC 0)

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Figure 2-1. AQ Extender Switch Location

Normal-Test/Override

The normal-test/override switch is located in the lower front corner of the AQ extender PWA.

In a dual-mode access configuration, connector J5 is connected by cables to the external dual-mode access override switch (figure 1-11). The dual-mode access switch then provides selection of override for CPU1 or CPU2 of a dual CPU system.

When the AQ extender PWA is installed in the I/O expansion the toggle switch remains in the normal (NML) position. The PWA is automatically connected to the expansion bus.

The normal-test/override switch operates as follows:

- Override (OVRD, up position) - Selects manual override of the expansion bus. The CPU diagnostic operation capability is inhibited. All program outputs to the AQ extender PWAs are rejected.

  The CPU is automatically connected to the expansion bus and the AQ extender is in the transparent mode. This is the position for standard system operation for a single CPU access system.

- Normal (NML, down position) - Program control is required to connect the CPU to the expansion bus. The switch is placed in the normal position for diagnostic testing only. The programmable echo test maintenance feature can only be performed with the switch in this position. This switch must be in this position for dual-CPU system configurations when the dual mode access switch is used.

Station Address Switch

The station address switch (location E4) is set to the complement of the actual station address. If the active station address Q register bits 4 through 6 equal binary 101, the station address switch setting is 010 (figure 2-1 and table 2-1).

Priority Switch

The priority switch (location M3) is not used for standard CYBER 18 installations. (Nonstandard uses of the I/O expansion subsystem are not supported in this manual.) Therefore, all switches of this assembly should be off (switch open).

DMA Extender

The DMA extender PWA (figure 2-2) contains eight LED indicators, one DIP switch, and three jumper positions. The DIP switch assembly (location F4) contains four switches that are used for selection of station address. The LEDs indicate PROM addresses. Two of the three jumpers are used in conjunction with the station address switch. (One is used for 20-bit addressing applications not supported in this manual.)

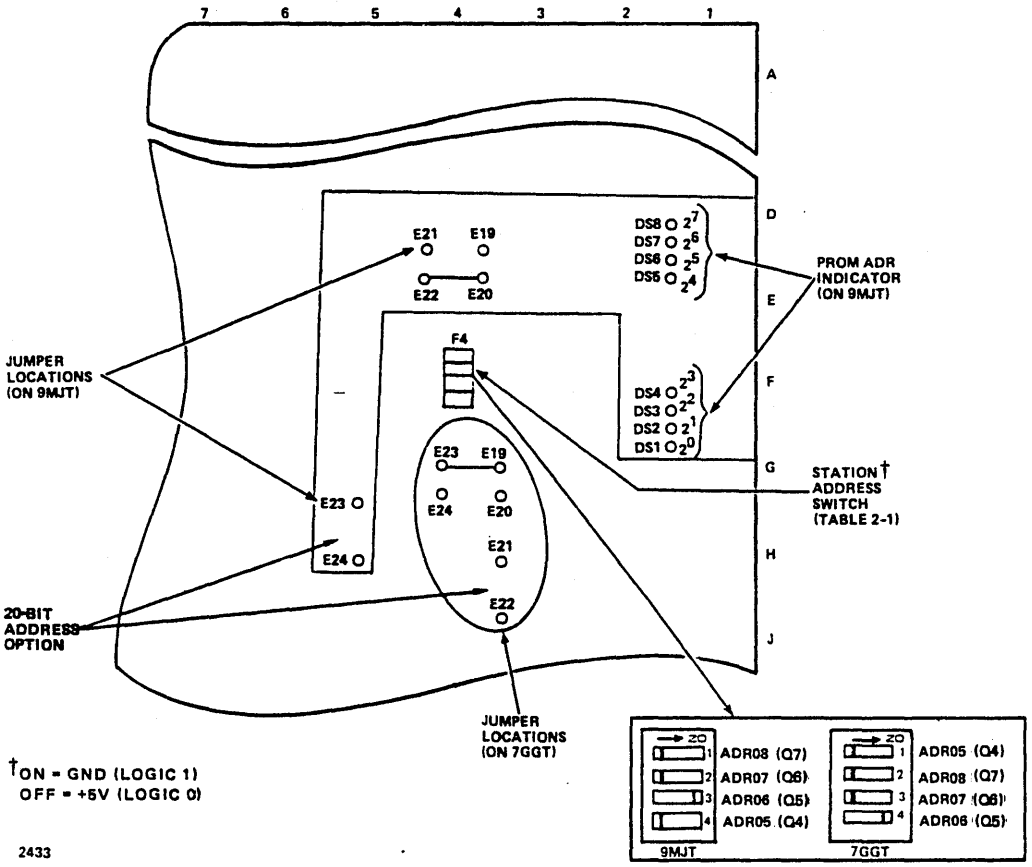


Figure 2-2. DMA Extender Switch, Indicator and Jumper Locations

Station Address Switch

The station address switches provide for the selections listed in table 2-1. Each DMA extender PWA in a system must have a different station address selected.

PROM Address Indicators

The eight PROM address indicators (DS1-DS8) indicate the hexadecimal address of the current microinstruction. If the self test malfunctions the binary address indicated by the LEDs (2^0-2^3 and 2^4-2^7) indicates the binary address at which the malfunction occurred. If the self-test is satisfactorily completed following a master clear, the LEDs indicate hexadecimal value 7F for the local DMAX PWA and FF for the remote DMAX PWA.

Jumper

There are three jumper locations on the DMAX PWA. Refer to table 2-2 for designation and function.

TABLE 2-1. STATION ADDRESS SELECTIONS

Station Address	ADR07 (Q6)	ADR06 (Q5)	ADR05 (Q4)	Normal Definition
0	OFF	OFF	OFF	LOCAL DMAX (CPU1 or CPU2)
1	OFF	OFF	ON	CPU CONSOLE
2	OFF	ON	OFF	REMOTE DMAX (CPU1)
3	OFF	ON	ON	REMOTE DMAX (CPU2)
4	ON	OFF	OFF	UNASSIGNED
5	ON	OFF	ON	AQX (LOCAL and REMOTE) (CPU1 or CPU2)
6	ON	ON	OFF	UNASSIGNED
7	ON	ON	ON	CPU TIMER

ADR08 is always off (not used) on DMAX PWAs
ON = Logic 1
OFF = Logic 0

Dual-Mode Access

The dual-mode access switch (figure 1-7) is located in the table top switch box. The switch selects one CPU to have access to the expansion bus and disconnects the bus from the other CPU. In either case the CPUs do not have program control over the AQ extenders. The selected AQ extender is in transparent mode and it locks out any AQ requests to an AQ extender that is not selected. Program control for diagnostic purposes can be obtained by deselecting both legs of the dual system. The program control of the AQ extender is described in the programming part of this section.

Interrupt Jumpers

The I/O expansion chassis provides for jumper wire connection of eight interrupt lines via the remote DMAX paddle board. Pin 49 provides an interrupt line output at the remote extender for the ORed 8:1 interrupt logic. Pin 249 provides an interrupt line from either DMA extender unit to the processor status mode interface, but this line is not normally connected. The interrupt configuration is established at installation and detailed in section 3 of this manual.

TABLE 2-2. DMAX JUMPERS

PWA Type		Jumper Setting	Function
7GGT	9MJT		
E19 and E23	E20 and E22	in†	Selects equipment address 0001 (Q10-Q7)
E20 and E24	E19 and E21	out†	
E19 and E23	E20 and E22	out	Equipment address (Q10-Q7) selectable by switch ADR08 (OFF=0000, ON=0001)
E20 and E24	E19 and E21	in	
E21 and E22	E23 and E24	in	20-bit DMA address
		out†	18-bit DMA address

†Normal configuration

PROGRAMMING

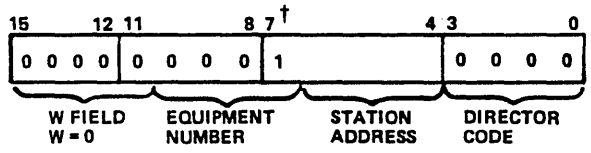
AQ EXTENDER

The AQ extender PWA, when the override/normal switch is set to normal, is programmable to the degree necessary to provide diagnostic testing. When override mode is selected, the equipment number and related circuitry are not active, and programmable operation is inhibited. An external reject occurs when function output commands are attempted and the extender PWA is in override mode.

Function Output

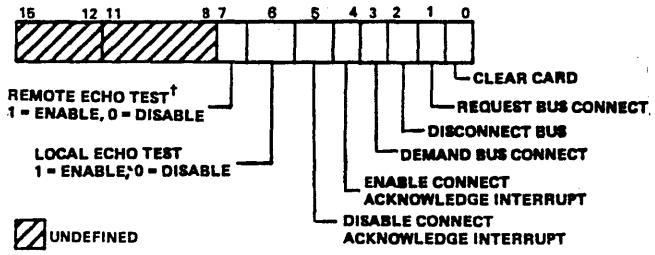
The AQ extender PWA is hardwired to the equipment address of 0001 (bits Q07-Q10). The address and data formats are as follows:

Address (Q)



†BIT 7 IS HARDWIRED HIGH

Function (A)



†FEATURE AVAILABLE ONLY WITH AT314-E (NOT AVAILABLE WITH AT314-C)

Bit 0 - Clear card - Clears out control for function and status flip-flops.

Bit 1 - Request bus connect - CPU requests connection to expansion bus. The requesting unit then connects to the bus and sends its connect acknowledge interrupt, if enabled, to CPU.

Bit 2 - Disconnect bus - The AQ extender disconnects from the expansion bus.

Bit 3 - Not used.

Bit 4 - Enable connect acknowledge interrupt - Enables the AQ extender to generate an interrupt to the CPU upon completion of the connect sequence. The interrupt is reset at the end of a status read operation.

Bit 5 - Disable connect acknowledge interrupt - Disables interrupt capability from the connecting sequence.

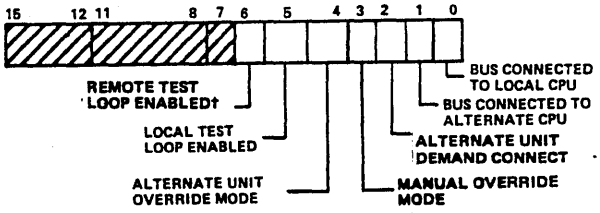
Bit 6 - Enable (1)/disable (0) - Echo test loop for the extender PWA in the CPU chassis.

Bit 7 - Enable (1)/disable (0) - Echo test loop for the extender PWA in the expansion chassis.

Status Input

The address (Q format) for status input is the same equipment connect code that is used in the function output. The status bits are:

Status (A)



†FEATURE AVAILABLE ONLY WITH AT314-E (NOT AVAILABLE WITH AT314-C)

Bit 0 - Expansion bus connected to local CPU.

Bit 1 - Expansion bus connected to alternate CPU.

Bit 2 - Alternate unit demand connect.

Bit 3 - Manual override mode selected - Local extender unit switch is in override position and all function outputs are rejected.

Bit 4 - Alternate CPU override mode selected - Alternate CPU AQ extender (dual mode) is in override mode, and all function outputs are rejected.

Bit 5 - Local test loop enabled - Maintenance test loop for the local AQ extender PWA is enabled.

Bit 6 - Expansion test loop enabled - Maintenance test loop for the remote AQ extender PWA is enabled.

Reply/Reject

A reply is always sent to the CPU for all status input operations that contain the AQ extenders equipment/station number. A reply is sent for all function output operations, except when the unit is in override mode.

An external reject is sent to the CPU from the AQ extender when function output operations are requested and the unit is in override mode.

An internal reject occurs if the AQ extender is disconnected from the expansion bus and an I/O cycle to a peripheral is attempted.

Interrupts

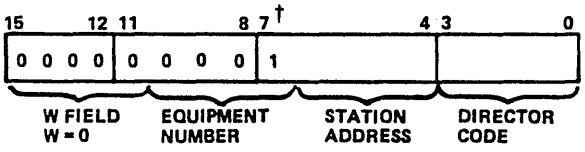
The local AQ extender PWA provides the CPU with a connect acknowledge interrupt, when enabled. This interrupt, CNT INT on pin 97 (J8 of the paddle board), is generated when the expansion bus connect sequence is complete. The interrupt is reset at the trailing edge of a status read operation. The interrupt is enabled/disabled by function output commands.

DMA EXTENDER

Although the DMA extender operates in a transparent mode (requires no program set up or control), it may be programmed via AQ commands for diagnostic testing. Both the remote and local extenders respond to the same basic commands described in the following subsections unless otherwise noted.

Director Codes

The Q register address format is:



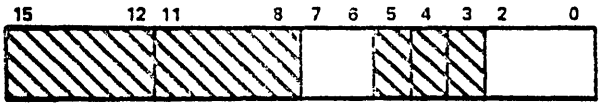
†BIT 7 IS HARDWIRED HIGH

Error Count Status (DIRC = 0 INPUT)

All transmission error retry attempts are counted and available as a status count, which is transferred to the A register. The count is cleared after each director status read or controller clear command. The count wraps around if its maximum count of 255 is reached. The error count is designed to provide some indication of transmission reliability at a level below the dual parity fault abort condition.

Director Function (DIRC = 1 OUTPUT)

For a director function, the output from the A register is:



UNDEFINED

Bit 7 - Equal to one sets the protect system in the DMA extender.

Bit 6 - Works with bit 7 to set or reset the extender protect feature. Bits 6 and 7 must be mutually exclusive or bit 7 takes precedence over bit 6. If bit 6 is equal to one the DMAX is made to be unprotected.

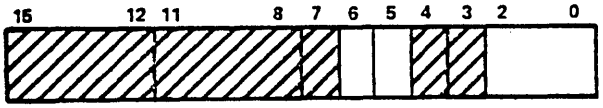
Bit 2 - Equal to one directs the micro-code to retry a parity failed expansion transmission until it is successfully accomplished.

Bit 1 - Equal to one conditions the remote extender to issue a hardware interrupt when even a single transmission parity error is detected.

Bit 0 - Equal to one directs the micro-code to execute the master clear and self-test portion of the program. This bit overrides all other function/control bits and sets the extender to its initial state.

Director Status (DIRC = 1 INPUT)

For a director status read operation, the A register has the following format:



UNDEFINED

Bit 6 - Equal to one if the DMAX is protected.

Bit 5 - Equal to one if the DMAX has attempted a resync operation.

Bit 2 - Equal to one if the DMAX has successfully completed resync operation.

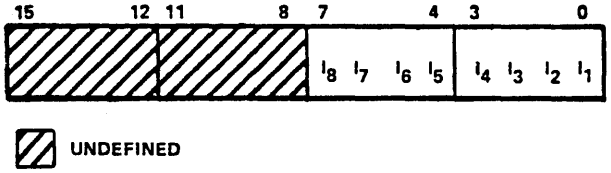
Bit 1 - Defined only for the remote extender and is equal to one if a DMA extender transfer has to be repeated due to a parity error detected by the local extender (remote to local transfer).

Bit 0 - Defined differently for local DMAX and remote DMAX. Local - Bit 0 is equal to one if the controller is awaiting completion of its initial DMA memory transfer, and is equal to zero if the transfer is complete. Remote - Bit 0 is equal to one if a DMA transfer was retried due to a parity error detected by the remote DMAX (local to remote transfer).

A status read clears temporary status bits 5, 1, and 0. Bit 6, protect, and bit 2, sync status bits remain set until changed by program control.

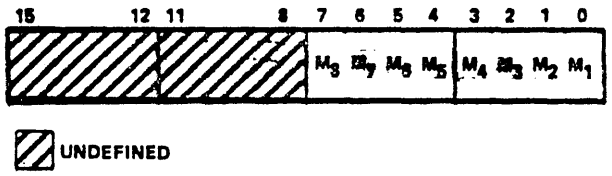
Interrupt Status (DIRC = 5 INPUT)

An input to the A register from the remote extender of the interrupt status words yields an 8-bit byte, giving the unmasked status of the eight multiplexed interrupt signal lines. A one in any bit position indicates an active interrupt.



Interrupt Mask (DIRC = 5 OUTPUT)

The remote extender may be directed to mask the expansion interrupt byte before issuing a multiplexed hardware interrupt. A one in the output mask word allows an interrupt from the multiplexed interrupts, when provided an active input interrupt on the corresponding interrupt input line.



Dummy Output (DIRC = 9 OUTPUT)

The dummy output is a reply response only and has no functional usage.

Reply/Reject

The extender responds with a reply or reject to an A/Q cycle when the W field equals 0, the equipment code equals 1, and the station number equals the number established by the PWA switch settings. The station code must be different for the local and remote DMAX PWAs. The response to all director codes is listed in table 2-3.

A further condition for a reply response requires the A/Q protect system be satisfied. Any I/O cycle may be protected or unprotected, as may the DMA extender. A reply is issued if the following holds true:

REPLY = I/O protected or DMAX unprotected.

A reject is the logical complement of the reply function as follows:

REJECT = I/O unprotected and DMAX protected.

Protect Programming

The extender is designed to be programmably protected or unprotected, rather than switch selectably protected. Basically, only a protected AQ instruction may unprotect the extender, whereas any accepted command may set protect.

TABLE 2-3. DMAX DIRECTOR CODE RESPONSE DEFINITIONS

Director Code	Input/ Output	Response		Definition
		Local	Remote	
0	In	Reject	Reply	Error count status
	Out	Reject	Reject	Not used
1	In	Reply	Reply	Director status
	Out	Reply	Reply	Director function
2 thru 4	I/O	Reject	Reject	Not used
5	In	Reject	Reply	Interrupt status
	Out	Reject	Reply	Interrupt Mask
6 thru 8	I/O	Reject	Reject	Not used
9	In	Reject	Reject	Not used
	Out	Reject	Reply	Dummy output
A thru F	I/O	Reject	Reject	Not used

This section provides the information necessary for installing and performing initial checkout of the I/O expansion subsystem that has the I/O expansion chassis, power supply, and RS232-C connector panel installed in a modified GH447 vertical cabinet.

UNCRATING

I/O EXPANSION UNIT

Expansion units shipped already installed in the vertical cabinet (figure 3-1) are uncrated as follows:

1. Cut the strapping and remove the corrugated top and cushioning pad.
2. Cut the fiber banding that secures the outer corrugated cover.
3. Remove the corrugated cover, cushioning material and plastic dust cover.
4. Using two roller lifts, insert the forks at the front and rear of the cabinet.
5. Carefully lift the cabinet. If cabinet is on a skid, remove the skid.
6. While the cabinet is on the roller lifts, position the cabinet at its intended installation location, and remove roller lifts.
7. Remove the banding and the tape securing the cabinet front and rear access doors.
8. Open the cabinet doors. Remove all wood block supports and cushioning material.

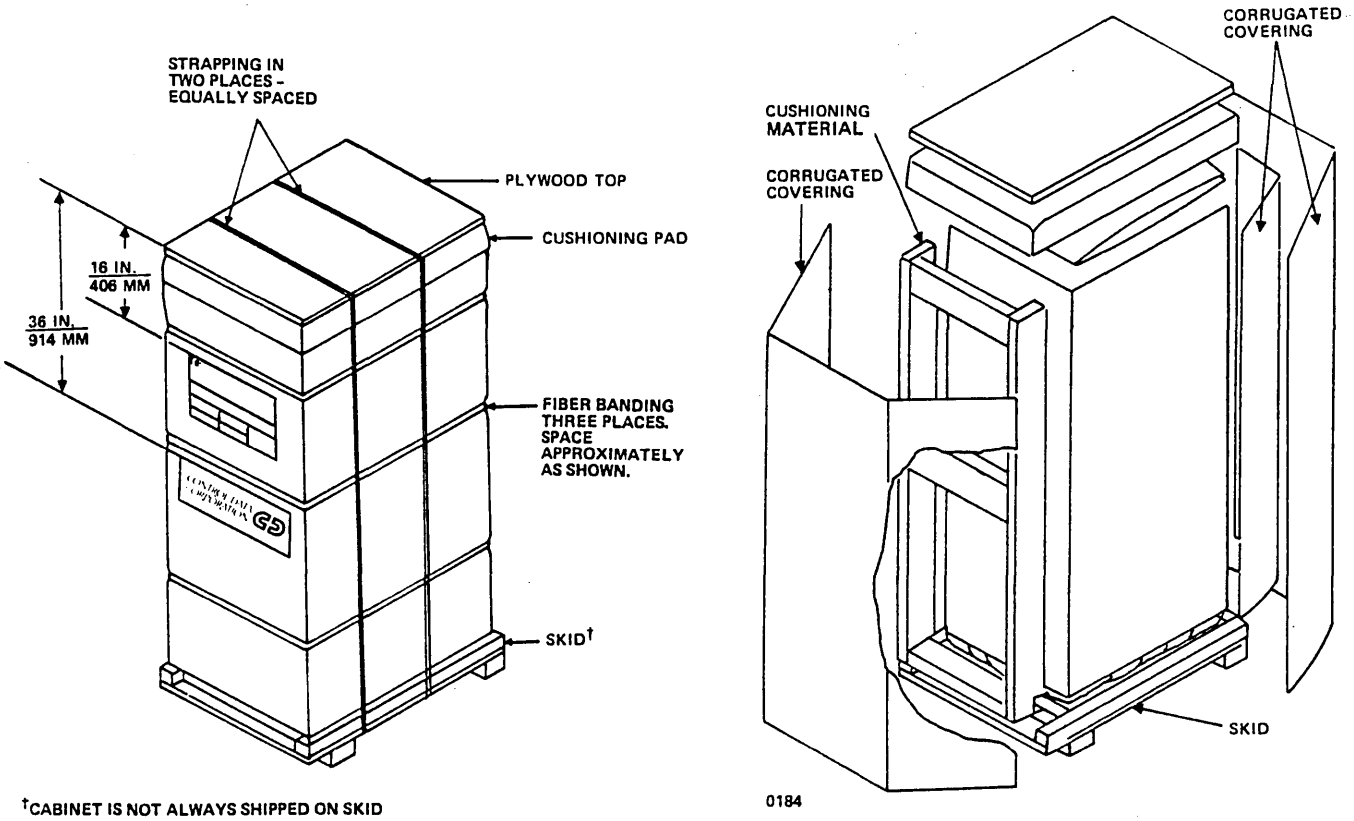


Figure 3-1. I/O Expansion Subsystem Vertical Cabinet Crating

AQ AND DMA EXTENDERS

The extender PWAs and paddle boards are shipped installed in the expansion unit or packed in a heavy-duty cardboard carton. All cables are packed in a cardboard carton. When packed in cartons, the items are buffered from shock and impact damage by an industrial filler. The PWAs are also inserted in antistatic or conductive bags. No special instructions are required to uncrate the extender PWAs.

INSPECTION

Upon receipt, inspect the items as follows:

1. Remove the items from the shipping container.
2. Check the contents of each container against the packing list.
3. Examine all connector plugs and the backpanel for possible bent, missing, or broken pieces.
4. Inspect all cables for damage to the insulation or shield braid and security of connectors.
5. Inspect PWAs and chassis assemblies for physical damage.
6. Check seating of all pluggable IC components.

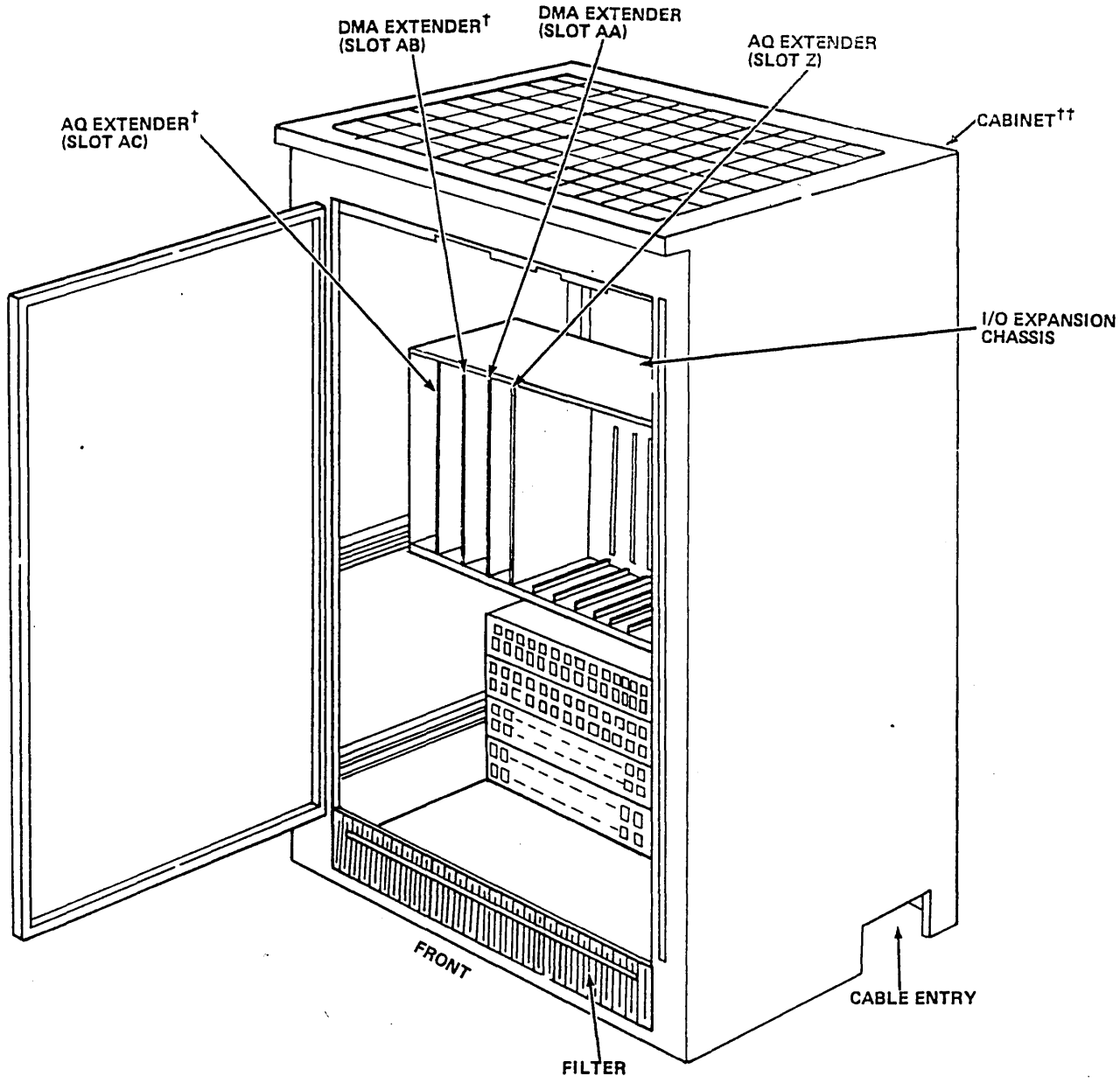
PARTS LIST

Table 3-1 lists the major components included in the I/O expansion subsystem. Figure 3-2 shows how these major components fit together.

TABLE 3-1. I/O EXPANSION SUBSYSTEM MAJOR COMPONENTS

Equipment Number	Name	Quantity Per System	
		Single	Dual
CW218	I/O Expansion Unit		
	Power Supply	1	1
	I/O Expansion Chassis	1	1
	Expansion Interrupt Cable	1	1
	Connector Mounting Panel	4	4
	Cable Retainer Panel	1	1
AT314	AQ Extender		
	AQ Extender PWA	2	4
	I/O Expansion Cables	3	6
	Local AQ Paddle Board	1	2
	Remote AQ Paddle Board	1	2
BU272	DMA Extender		
	DMA Extender PWA	2	4
	I/O Expansion Cables	2	4
	Local DMA Paddle Board	1	2
	Remote DMA Paddle Board	1	2
	Expansion Connect Cable†	1	2
AU115	IOX Dual Mode Access		
	Dual Access Switch Box Assembly	0	1
	Dual Mode Cable	0	1

†Cable used for dual-access mode only.



NOTE:

†REQUIRED ONLY FOR DUAL-MODE ACCESS (DUAL CPU) SYSTEMS

††ITEMS NOT PART OF I/O EXPANSION SUBSYSTEM

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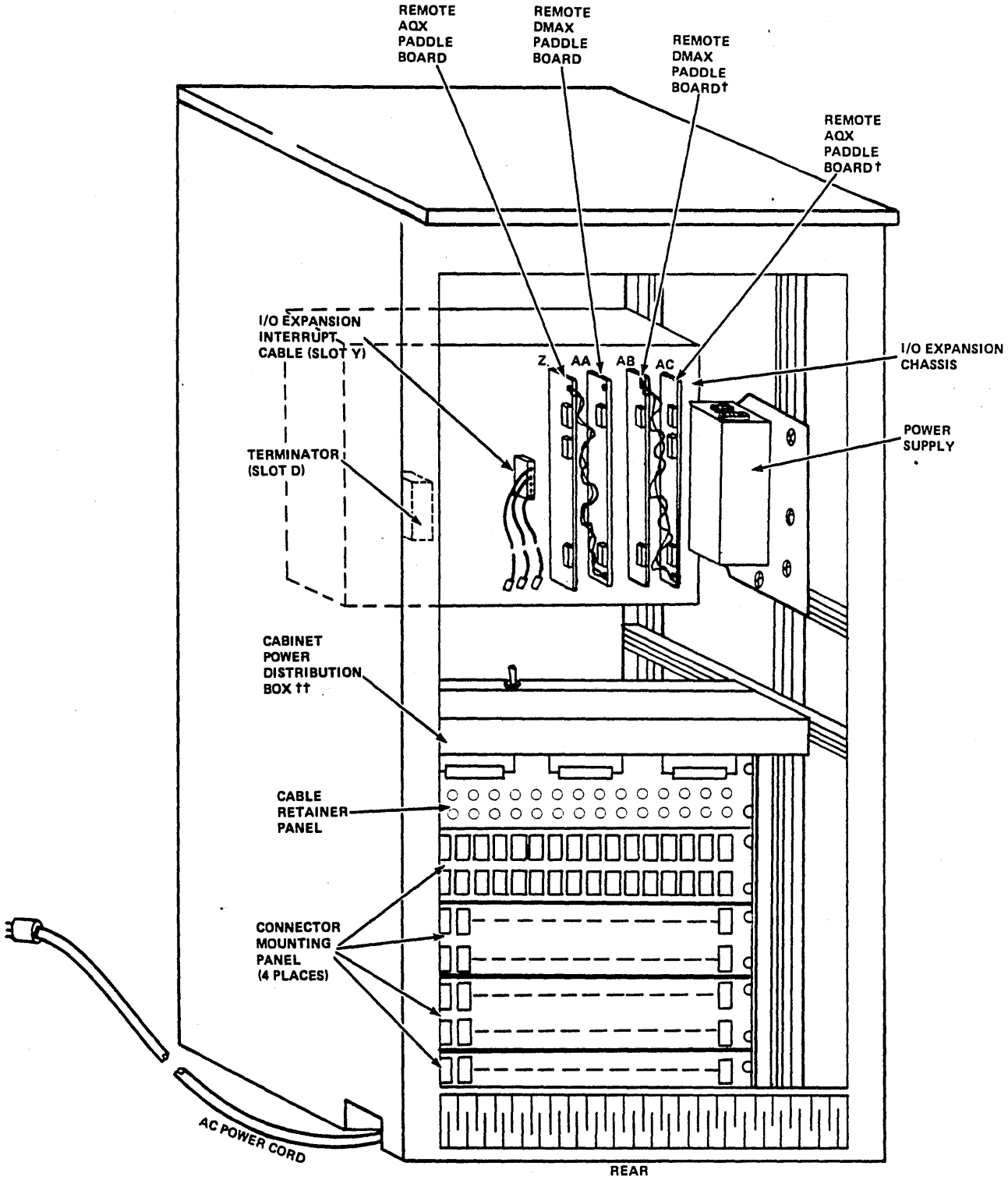
Figure 3-2. I/O Expansion Subsystem (Sheet 1 of 2)



†REQUIRED ONLY FOR DUAL-MODE ACCESS (DUAL CPU) SUBSYSTEMS.
††ITEMS NOT PART OF I/O EXPANSION SUBSYSTEM.

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Figure 3-2. I/O Expansion Subsystem (Sheet 2 of 2)

CRATING

Crating the I/O expansion subsystem is performed in the reverse order of each the uncrating instructions.

POWER REQUIREMENTS

POWER

The I/O expansion unit requires 120 V ac, 50/60 Hz, 12 ampere, single phase power for operation.

POWER CABLING

The I/O expansion unit is supplied with an attached power cord. Compare the unit nameplate power rating with the available site power source before making the connection to the power source. Route the cable from the power distribution box, out the rear or side access cutout to the power source. Do not make the connection to the power source until the installation requires power.

GROUNDING

SYSTEM GROUNDING

Connect the braided shield, with the insulation sleeve attached to the cabinet ground terminal (TB01) at the floor of the cabinet, to the site ground point.

SIGNAL CABLE GROUNDING

All signal cables entering the processor and expansion cabinets require the cable shield to be grounded at the cable entry (figure 3-3). The cable entry (cable access box) on the processor is located directly below the backplane signal pins. The cable entry (cable retainer panel, figure 3-2) for the expansion cabinet is located below the power distribution box. The ground point also provides strain relief for the signal cables. Ground is accomplished by clamping the signal cable braided shield to the entry panel with U-bolts. For dual mode access operation, two large U-bolts are required to ground additional cables. These U-bolts are supplied with the dual mode access equipment. Cables connected to the connector mounting panel of the I/O expansion unit do not require this grounding technique.

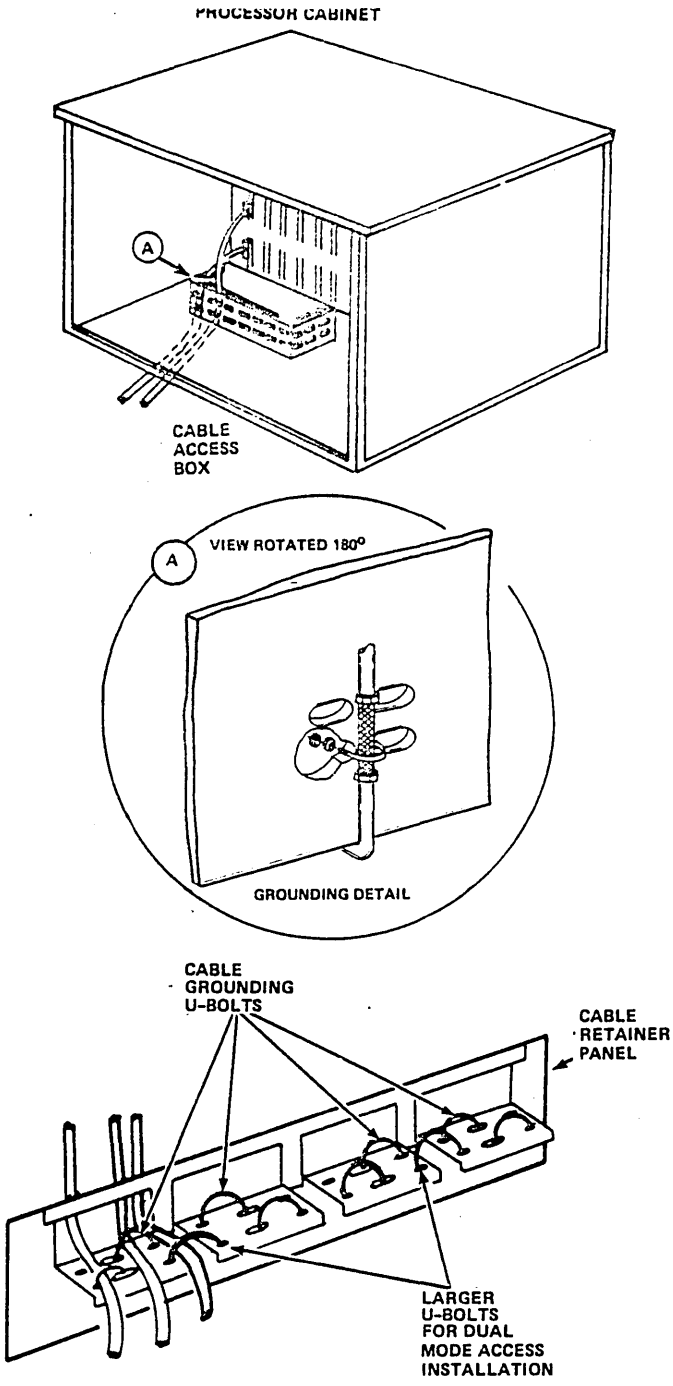


Figure 3-3. Cable Grounding

IOX AQX AND DMAX SLOT ASSIGNMENTS

CPU bus expansion is achieved by a total of four PWAs: two DMAX PWAs and two AQX PWAs. Dual CPU I/O expansion requires two sets of equipments or a total of eight PWAs. The IOX requires two dedicated slots in each host CPU: one AQ-DMA slot for the DMAX PWA and one AQ slot for the AQX PWA.

CYBER 18 CPU

Standard AQX and DMAX slot assignments in the CYBER 18 CPU are slot A for the DMA extender PWA (DMAX) and slot AA for the AQ extender PWA (AQX). If these slots are occupied any empty AQ-DMA slot may be used for the DMAX PWA and any empty AQ slot may be used for the AQX PWA.

SINGLE ACCESS

The DMAX PWA standard slot is AA of the I/O expansion chassis, and the AQX PWA standard slot is Z (figure 3-2).

DUAL ACCESS

The DMAX PWA standard slot is AA of the I/O expansion chassis, and the AQX PWA standard slot is Z for extenders associated with CPU1. The DMAX PWA standard slot is AB and the AQX PWA standard slot is AC for extenders associated with CPU2.

IOX PWA SWITCH SETTINGS

The paragraphs that follow specify controller switch settings that are used during manufacturing checkout, and that are required for diagnostic testing (table 2-1). The user is not restricted to using these switch/address assignments during data processing.

AQX SWITCHES

There are two DIP switch assemblies and one toggle switch on the AQX PWA (figure 2-1), station address switch, dual access priority switch, and override/normal toggle switch. The two DIP switches are not used when the AQX is installed in the expansion chassis.

DIP Switches

The station address switch is a four segment DIP package located at board position E4. The station address is a 3-bit field of the Q register (figure 2-1), therefore, the fourth switch position is not used. Refer to table 3-2 for standard equipment/station codes.

The priority DIP switch element is located at M3 and is not used, however all switches should be off.

Toggle Switch

The override/normal toggle switch can be used for three operating conditions:

- Single CPU transparent operation - Set to override
- Dual CPU transparent operation - Both local AQX switches set to normal (control is through the external dual-mode access switch).
- Single CPU test mode - Set to normal for AQX tests; override for DMAX tests

Dual CPU test mode is the same as single CPU test mode, with the dual-access switch box cable disconnected.

DMAX SWITCHES

The following switch and jumper configurations must be properly established before installing the DMA extender PWAs (figure 2-2) into their slot positions.

Equipment Code

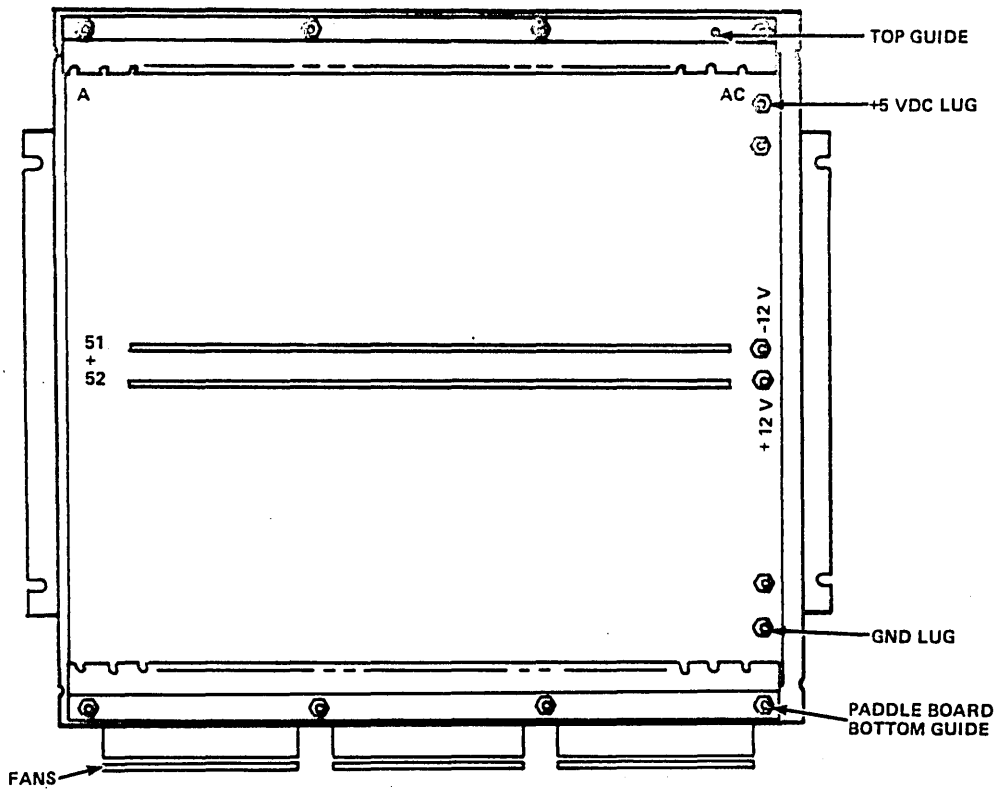
The unit is hardwired for equipment address code 0001 (Q10 through Q7) by one jumper between terminals E20 and E22 on 9MJT (E19 and E23 on 7GGT). Refer to table 3-2 for standard equipment/station codes.

TABLE 3-2. STANDARD IOX EQUIPMENT/STATION CODE ASSIGNMENT

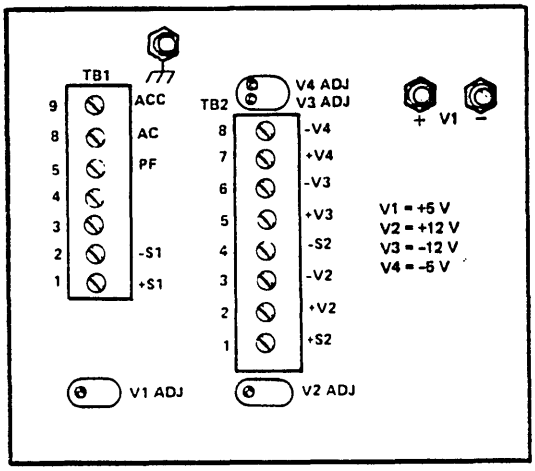
Processor	DMAX	AQX	AQX Normal/Override
CPU1 Local	008x	00Dx	Normal-Test† Override (Single)
CPU1 Remote	00Ax	00Dx††	Normal-Test
CPU2 Local	008x	00Dx	Normal-Test
CPU2 Remote	00Bx	00Dx††	Normal-Test

†If dual configuration

††AQX not addressable in expansion chassis



EXPANSION CHASSIS BACKPANEL



EXPANSION CHASSIS POWER SUPPLY

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Figure 3-4. Dc Power Supply and Backpanel Test Points

Station Address

Segments SB0, SB1, and SB2 of the DIP switch (location F4) is used to set a station address for the DMA extender. Each remote DMA extender PWA in a system must have a different station address selected. Refer to table 2-1 and establish the station address for each extender PWA to be installed.

POWER ON AND VOLTAGE TESTING

To apply power to the expansion chassis and to verify proper power supply voltages, perform the following steps. Refer to figure 3-4 for power supply test point and adjustment potentiometer locations.

+5 V, +12 V, AND -12 V DC POWER

1. Connect the expansion cabinet ac power cord to the site power source.
2. Verify that the power distribution box MAIN POWER circuit breaker (CB01) is on (figure 3-5).
3. Place the power distribution box power switch (S01) to ON (figure 3-5).
4. Verify that the expansion chassis cooling fans are rotating.
5. Using a volt-ohmmeter, measure the dc voltages between the ground terminal lug and each voltage terminal lug on the expansion chassis backpanel (figure 3-4). If the indicated voltages are not within one percent of the terminal lug labeled value, adjust the associated power supply voltage potentiometer accordingly. Clockwise rotation increases the output voltage. The potentiometers are located on the face of the power supply (figure 3-4).
6. After verification, remove power by setting the power switch (S01) to OFF.
7. After all peripheral equipments have been installed, apply power, recheck the dc voltages and proceed with diagnostic testing.

-5 V DC SUPPLY REQUIREMENTS

The -5 V dc supply voltage is not available to any slot in the standard backpanel configuration. The -5 V source is available only if added, as required, by wirewrapping or jumpering from the -5 V peripheral slot pin and the backpanel -5 V bus pins located between the slot pin rows near pins 102 and 302.

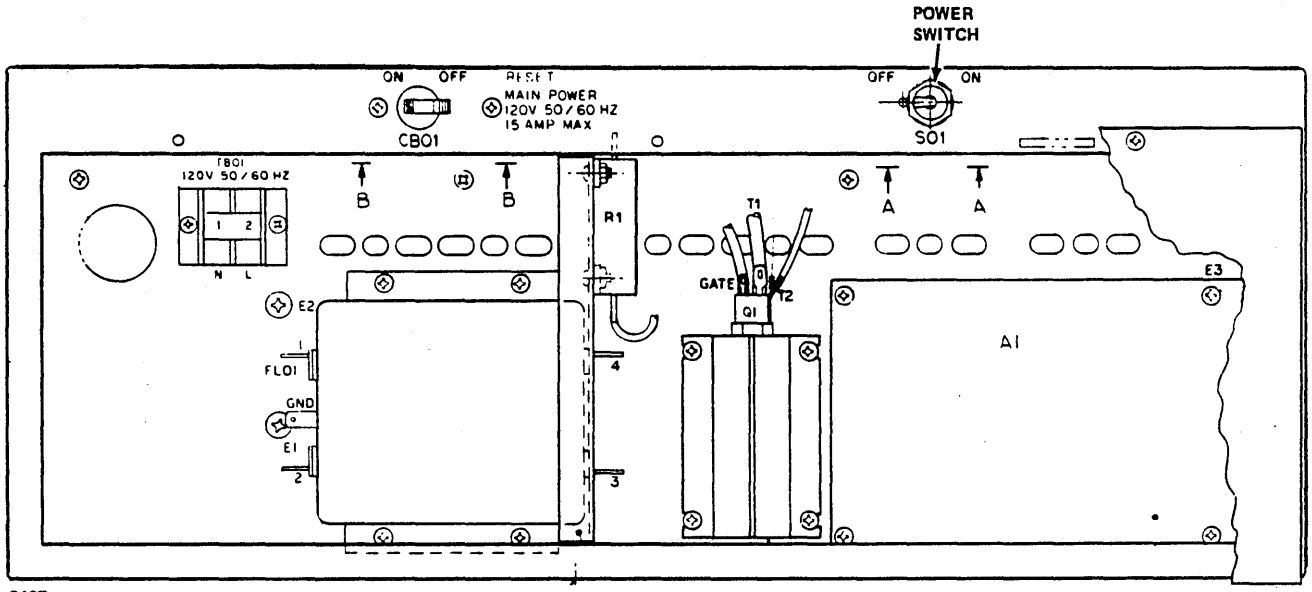


Figure 3-5. Power Distribution Box

AQ EXTENDER INSTALLATION

Follow this procedure to install and verify operation of a single AQ extender (AT314). If dual access is required, complete the single installation and checkout for one complete CPU first; then refer to the section on dual-mode access installation below.

1. Locate the following parts and components

2	AQX PWAs	(figure 1-8)
1	Remote AQ paddle board	(figure 1-9)
1	Local AQ paddle board	(figure 1-9)
3	I/O expansion cables	
1	Terminator	(figure 1-1)

2. Set the switches on all the AQX PWAs (figure 2-1 and table 2-1) for CPU1.

3. Remove power from the CPU and I/O expansion unit.

4. Insert one AQX PWA into CPU slot AA (figure 1-2).

5. Very carefully install the AQ local paddle board (figure 1-2) on the CPU backplane slot AA (components to the left).

CAUTION

All paddle boards must be installed with care as a single misaligned pin may cause irreparable damage to the paddle board or backpanel or both.

6. Install the AQX remote paddle board (figure 1-2) on the backpanel of the I/O expansion chassis corresponding to slot Z (components to the left).

7. One at a time label the three AQX I/O expansion cables (label at both ends of each cable). On the blank label on each connector write the following:

AQX-CPU1-TOP
AQX-CPU1-MIDDLE
AQX-CPU1-BOTTOM

At this point you are ready to verify AQX PWA operation prior to completing system test.

8. Apply power to the CPU.

9. Place the AQX toggle switch to NORMAL-TEST position (down).

10. Load the IOX ODS Level 1 diagnostic and execute the local loopback test. For diagnostic operation see section 6.

11. After successful execution of the local loopback diagnostic, remove the AQX PWA and replace it with the second AQX PWA.

Repeat steps 9 through 11 to include all AQX PWAs and spares.

The following steps complete the AQ extender installation:

12. Install a tested AQX PWA in the I/O expansion chassis slot Z (components to the left).

13. Referring to figure 1-2, install the three AQX I/O expansion cables as labeled. The cables are assembled to feed downward and keyed so that they cannot be reversed. The three cables connect one-to-one between the AQX remote and local paddle boards.

14. Ensure that terminator is installed at slot D over pins 52/252 through 66/266.

15. Set the local AQX toggle switch to NORMAL-TEST position (down).

16. Apply power to the I/O expansion unit.

17. Load the IOX ODS Level 1 diagnostic and re-execute the local loopback test; then execute the remote loopback test.

18. Set the local AQX toggle switch to its override position (up).

AQ extender installation is now complete.

DMA EXTENDER INSTALLATION

The DMAX equipment (BU272) does not have loopback test features. The ODS IOX test and internal self test verify a major portion of the DMA extender. Additional DMAX verification can be accomplished by installing any supported AQ-DMA controller/subsystem.

Follow this procedure to install and verify operation of a single DMA extender after its companion AQ extender installation is completed. If dual access is required, complete the single installation and checkout for both CPUs first and then refer to the dual mode access installation.

1. Locate the following parts and components:

2	DMAX PWAs	(figure 1-10)
1	DMA Remote paddle board	(figure 1-11)
1	DMA Local paddle board	(figure 1-11)
2	I/O expansion cables	
1	Expansion connect cable (used for dual mode only)	

2. Set the station address switches and option jumpers on the two DMAX PWAs as required for CPU1 (table 2-1 and figure 2-2) one for local and one for remote.

3. Remove power from the CPU and the I/O expansion unit.

4. Insert the local DMAX PWA (station address 0) into slot A of the CPU.

5. Insert the remote DMAX PWA (station address 2) into slot AA of the I/O expansion chassis.

NOTE

Local and remote DMA paddle boards are not identical. A quick visual key, other than PWA numbers, is that the remote paddle board has the greater number of single-in-line (SIP) resistor components.

6. Very carefully install the DMA local paddle board onto the CPU backpanel slot A (figure 1-2).

7. Very carefully install the DMA remote paddle board to the I/O expansion backpanel slot AA (figure 1-2).

8. One at a time label each of the two DMAX I/O expansion cables at both ends as follows:

   DMAX-CPU1-TOP
   DMAX-CPU1-BOTTOM

9. Referring to figure 1-2 install the two DMAX I/O expansion cables between the local and remote DMAX paddle boards, as marked.

10. Ensure that the local AQX toggle switch is set to OVERRIDE position (UP).

11. Apply power to the CPU and I/O expansion unit. Master clear the CPU.

NOTE

Always master clear the CPU after inserting a DMAX PWA or applying power to the I/O expansion unit. If master clear self-test was successfully completed, the LED displays of the local DMAX should indicate 7F and the remote DMAX should indicate FF.

Checkout can now be accomplished using ODS IOX diagnostics. Refer to section 6 of this manual for ODS procedures and DDLTs.

DUAL MODE ACCESS I/O EXPANSION INSTALLATION

Installation of the second CPU's I/O expansion subsystem is essentially identical to the first. The user should note that the IOX ODS Level 1 loopback tests run only in a single configuration. Therefore, installating and testing of CPU2's AQ and DMA extenders require temporary disconnection of CPU1's AQ and DMA extenders. The dual-access installation instructions augment the previous installation instructions pointing out only the variances required for CPU2.

CPU1 DISCONNECT

For purposes of CPU2 IOX installation and checkout prior to dual-access integration, disengage the I/O expansion chassis AQX and DMAX PWAs from slots Z and AA, respectively.

CPU2 AQX

Follow the AQ extender installation procedure and substitute the following steps as applicable:

6. Install the AQX remote paddle board (figure 1-3) in slot AC of the I/O expansion chassis backpanel (components to the left).

7. Label the I/O expansion cables as follows:

   AQX-CPU2-TOP
   AQX-CPU2-MIDDLE
   AQX-CPU2-BOTTOM

12. Install a tested AQX PWA in I/O expansion chassis slot AC (components to the left).

13. Referring to figure 1-3, install the three I/O expansion cables as labeled.

CPU2 DMAX

Follow the DMA extender installation procedure and substitute the following steps as applicable:

2. Set the station address switches and jumpers on the two DMAX boards as required for CPU2 (table 2-1, figure 2-2).

5. Insert the remote DMAX PWA (station address 3) into slot AB of the I/O expansion chassis

7. Very carefully install the DMA remote paddle board to the I/O expansion backpanel slot AB (figure 1-3).

8. Label the I/O expansion cables as follows:

   DMAX-CPU2-TOP
   DMAX-CPU2-BOTTOM

9. Referring to figure 1-3 install the two DMAX I/O expansion cables between the local and remote DMAX paddle boards as labeled.

Dual Checkout and Installation

When the two halves work properly, independently of one another, the task is to verify that they operate properly together.

1. Locate the following parts and components:

   1 Dual mode cable

   1 Dual access switch box assembly

   2 Expansion connect cables (one each supplied with DMA extender).

2. Install the two expansion connect cables (figure 1-3); one from J5 of the remote DMAX paddle board (slot AA) to J4 of the remote AQX paddle board (slot Z), the other from J5 of the remote DMAX paddle board (slot AB) to J4 of the remote AQX paddle board (slot AC).

NOTE

The black wire (of the red-black twisted pair combination) should be closest to the paddle board PWA.

3. Place all AQX toggle switches to the NORMAL/TEST position (down).

4. Insert the AQX and DMAX PWAs disengaged previously for CPU1 (master clear after insertion).

5. Install the dual-mode cable between connector J6 of the CPU1 AQX local paddle board and connector J6 of the CPU2 AQX local paddle board (figure 1-3). Be sure each connector end mates to all of the PWA header pins. The cable ends are interchangeable. The connector is not keyed but is labeled TOP for proper insertion.

6. Install the dual-mode access switch box assembly. Attach the cable end labeled CPU1 to connector J5 of the CPU1 AQX local paddle board. Attach the end labeled CPU2 to connector J5 of the CPU2 AQX local paddle board. The black wire of the cable pair should be closest to the paddle board PWA. Place the switch box assembly in any convenient position.

7. Set the dual-mode access switch box toggle switch to CPU 1. The toggle switch is a locking lever type to prevent accidental access switching. The toggle lever must be pulled out slightly to allow resetting.

8. Master clear CPU1 and CPU2.

9. Set the dual-mode access switch box toggle switch to CPU 2.

10. Master clear CPU1 and CPU2.

Dual mode I/O expansion is now complete.

PERIPHERAL EQUIPMENT

Refer to the CYBER 18 installation manual. Route all peripheral signal cables from the I/O expansion chassis backpanel pins or adapter paddle boards through cable retainer U-bolts located below the power distribution box, through the expansion cabinet side or rear cable entry panel, and to the peripheral equipments.

BCLA CABLING

The signal connection between the BCLA (buffered communication line adapters) and the 136-position RS232-C connector panels is provided by ribbon cables attached to the BCLA backplane adapter boards. One ribbon cable is provided for each channel of the BCLA. Each cable is terminated with a standard 25-pin (male) RS232-C connector. Mounting hardware for attaching the ribbon cable connectors to the connector panel is supplied with the BCLA.

Route each ribbon cable (if not previously installed) from the BCLA backpanel adapter boards to any unoccupied cutout of the connector panel (figure 3-2). Attach the ribbon cable connector to the front surface of the connector panel using two nuts and two washers on the front side of the panel (cabinet front), and two jackscrews on the rear side of the panel (cabinet rear).

The external signal cables to modems or terminals mate to the BCLA ribbon cable connectors at the rear side of the RS232-C connector panel. The external cables must be terminated with standard 25-pin (female) RS232-C connectors. Mate the external signal cables to the BCLA ribbon cable connectors at the rear of the RS232-C connector panel and attach the connector to the existing jack screws. Ensure that each external cable is mated to the desired channel ribbon cable of each BCLA. Route the external cables out the bottom of the cabinet to the external device. No strain relief clamp is required for these signal cables.

INTERRUPT WIRING

I/O EXPANSION INTERRUPTS

The interrupt wiring cable assembly is used for the expansion of the chassis-housed peripheral controller interrupt wiring. Install the I/O expansion interrupt cable assembly over the expansion chassis slot Y pins 52/252 through 64/264, as labeled on the connector. In general, systems only use the interrupt signal lines transmitted via the AQX, which are labeled INT1E through INT8E on the interrupt cable assembly jumpers and the local AQX paddle board.

To complete an I/O expansion interrupt connection between a controller and the CPU, perform the following steps:

1. In the I/O expansion chassis connect the interrupt cable assembly INT1E jumper wire to the selected controller slot Y interrupt pin (table 3-3).

2. At the CPU, use the desired interrupt jumper (may be micro or macro, as the user desires) to connect to the AQX paddle board expansion interrupt pin labeled INT1E (figure 3-6).

3. Repeat steps 1 and 2 for interrupt lines INT2E through INT8E as applicable.

MASKABLE INTERRUPT INPUTS

The interrupt cable assembly jumper wires labeled XINT1 through XINT8 are DMAX multiplexed/masked interrupt lines. These interrupts are multiplexed/masked at the remote DMA extender. The jumper wires from the interrupt cable assembly are connected to selected controller interrupt lines that are attached to slot Y connector pins. These interrupts are ORed by the remote DMA firmware to transfer one interrupt to the CPU. The software can then read interrupt status to determine which peripheral subsystem generated the interrupt.

To connect these maskable interrupts to the various DMA controllers and the CPU perform the following steps:

1. In the I/O expansion chassis connect the interrupt cable assembly jumper wires, XINT1 through XINT8, to the selected DMA controller interrupt pins at slot Y (table 3-3).

2. Select one of the unused INT1E through INT8E jumper wires of the interrupt cable assembly and attach it to pin 70 of slot Y.

3. At the CPU select the designated macro interrupt assembly jumper lead (INT00 through INT15). Connect it to the local AQX paddle board interrupt pin that corresponds to the jumper lead attached to pin 70 (step 2).

TABLE 3-3. EXPANSION CHASSIS INTERRUPT PIN ASSIGNMENTS

Signal Name	Slot	Pin	Comments
XINT1/	Y	59	Maskable interrupt inputs
XINT2/	Y	259	
XINT3/	Y	60	
XINT4/	Y	260	
XINT5/	Y	61	
XINT6/	Y	261	
XINT7/	Y	62	
XINT8/	Y	262	
RPINTXX/	Y	70	Maskable interrupt outputs
RPINTYY/	Y	270	Not used
MO5-INTP/	Y	87	MO5 interrupts (not used)
MO5-INTD/	Y	287	
INTP-F/	Y	71	Interrupts from all A/Q and DMA slots to slot Y are backplane wired.
INTD-F/	Y	271	
INTP-G/	Y	72	
INTD-G/	Y	272	
INTP-H/	Y	73	
INTD-H/	Y	273	
INTP-J/	Y	74	
INTD-J/	Y	274	
INTP-K/	Y	75	
INTD-K/	Y	275	
INTP-L/	Y	76	
INTD-L/	Y	276	
INTP-M/	Y	77	
INTD-M	Y	277	
INTP-N/	Y	78	
INTD-N/	Y	278	
INTP-P/	Y	79	
INTD-P/	Y	279	
INTP-R/	Y	80	
INTD-R/	Y	280	
INTP-S/	Y	81	
INTD-S/	Y	281	
INTP-T/	Y	82	
INTD-T/	Y	282	
INTP-U/	Y	83	
INTD-U/	Y	283	
INTP-V/	Y	84	
INTD-V/	Y	284	
INTP-W/	Y	85	
INTD-W/	Y	285	
INTP-X/	Y	86	
INTD-X/	Y	286	
INT1E/	Y	53	I/O expansion interrupts
INT2E/	Y	253	
INT3E/	Y	54	
INT4E/	Y	254	
INT5E/	Y	55	
INT6E/	Y	255	
INT7E/	Y	56	
INT8E/	Y	256	
MO5-SSEL/	Y	88	Special MO5 signals (not used)
MO5-SPT/	Y	288	
SSEL01/	Y	57	
SPT01/	Y	257	

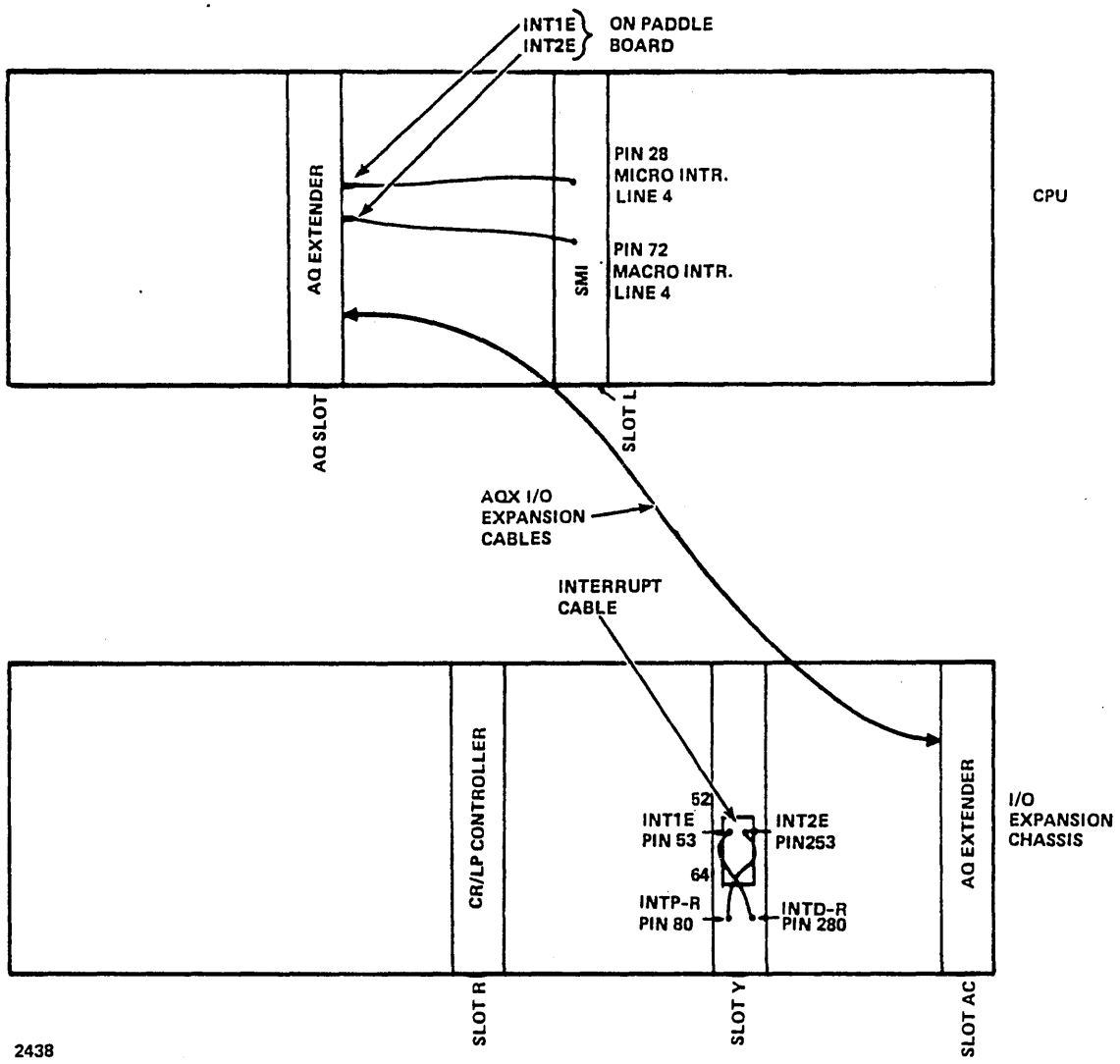


Figure 3-6. Interrupt Cable Jumper Installation

THEORY OF OPERATION 4

This section describes the block diagram theory of operation of the I/O expansion subsystem. The tables list and define the signal application. The text describes the block diagrams that represent the operation of the logic diagrams. The block diagrams contain blocks that represent functional groups of logic. The number appearing in the upper right corner of each block indicates the logic diagram sheet that contains the functional logic group. Refer to section 5 for the block diagram and all logic diagrams.

OVERALL FUNCTIONAL DESCRIPTION

I/O EXPANSION UNIT

The I/O expansion chassis contains no active elements other than the dc power supply. Therefore, there is no theory of operation for the chassis.

AQ Extender

The AQ extender provides the expansion of the CPU AQ-I/O bus to an expansion chassis. The signal pin-outs in the expansion chassis permit use of all AQ devices, with the exception of deadstart capability. Tables 4-1 through 4-3 tabulate the source and termination points of data and control signals for the AQX in the CPU and expansion printed wiring assemblies.

The AQ extender operates in the override mode. In single CPU operation the override mode is controlled by the toggle switch located on the local AQX.

- Override mode (switch up) automatically connects the extender unit to the expansion bus and disables any function control.
- Normal/test mode (switch down) enables test program control.

During dual-CPU operation the override/normal toggle switch must be in the normal position (switch down). The override mode is then controlled by the dual access switch box.

The remote AQX PWA toggle switch must be left in the NORMAL/TEST position (down).

TABLE 4-1. A/Q INTERFACE SIGNALS

Signal	Pin	Direction	True Level	Function
RD01/	204	To CPU	Low	LSB (A00)
RD02/	206			
RD03/	208			
RD04/	210			
RD05/	214			
RD06/	218			
RD07/	221			A data bits from the peripheral controller. In a read operation the 16-bit data word is transferred from the controller to the A register.
RD08/	224			
RD09/	226			
RD10/	229			
RD11/	231			
RD12/	234			
RD13/	236			
RD14/	239			
RD15/	241			
RD16/	244	To CPU	Low	MSB (A15)

TABLE 4-1. A/Q INTERFACE SIGNALS (Contd)

Signal	Pin	Direction	True Level	Function
SD01/	203	From CPU	Low	LSB (A00)
SD02/	205			
SD03/	207			
SD04/	209			
SD05/	211			
SD06/	215			
SD07/	219			
SD08/	223			A data bits to the peripheral controller. In a write operation, the 16-bit word is transferred from the A register to the controller.
SD09/	225			
SD10/	228			
SD11/	230			
SD12/	233			
SD13/	235			
SD14/	238			
SD15/	240			
SD16/	243	From CPU	Low	MSB (A15)
ADR01/	280	From CPU	Low	LSB (Q00)
ADR02/	247			
ADR03/	246			
ADR04/	245			
ADR05/	212			
ADR06/	217			
ADR07/	222			
ADR08/	281			Q address bits to the peripheral controller. The 9 highest order bits uniquely specify the device. The lower 7 bits specify the station/ function.
ADR09/	282			
ADR10/	283			
ADR11/	284			
ADR12	285			
ADR13/	286			
ADR14/	287			
ADR15/	288			
ADR16/	289	From CPU	Low	MSB (Q15)

TABLE 4-1. A/Q INTERFACE SIGNALS (Contd)

Signal	Pin	Direction	True Level	Function
SSTB-(READ)/	248	From CPU	Low	Initiates an input transfer of one data word (READ).
WRITE/	290	From CPU	Low	Initiates an output transfer of one data word (WRITE).
REPLY	216	To CPU	Low	Indicates controller acceptance of a computer read or write. The reply drops after the read or write drops (REPLY).
REJECT	220	To CPU	Low	Indicates controller response to a computer read or write when the operation cannot be performed (REJECT).
MR/	46	From CPU	Low	Clears the peripheral controller and the external equipment (MASTER CLEAR).
PROG PROT/	291	From CPU	Low	Indicates that this data transfer was initiated by an I/O instruction whose program protect bit is set.
WEO/	292	From CPU	Low	Indicates that bits 11, 12, 13, 14, and 15 of the address in the Q register are all zero (W=0).
RTERM/	213	To CPU	Low	Positions address 01
STERM/	48	From CPU	Low	Terminate signal for auto-data transfer
EX STOP/	293	To CPU	Low	External signal to stop CPU
EX MC/	294	To CPU	Low	External signal to clear CPU
EX GO/ (SET SM215/)	295	To CPU	Low	External signal to start CPU
SPT01/†††	227	From CPU	Low	Port address line 01
SSEL01/†††	251	From CPU	Low	Select line 01
RDINT01/†	250	To CPU	Low	Data interrupt 01††
RDINT02/†	50			
RDINT03/†	61			
RDINT04/†	62	To CPU	Low	Data interrupt 04††
RPINT01/†	249	To CPU	Low	Program interrupt 01††
RPINT02/†	49			
RPINT03/†	256			
RPINT04/†	257	To CPU	Low	Program interrupt 04††

†Wired or jumpered as required for peripheral devices

††The terms data and program are for reference only since the expanded interrupts are transparent. A data (or micro) interrupt line could be a program (or macro) interrupt and vice versa, as required.

†††SPT01 and SSEL01 signal lines (as well as unused interrupt expansion lines) may be used for special-purpose signal lines other than these so labeled. Example: MP CLA may use SSEL01 to expand the CPU baud rate clock.

TABLE 4-2. I/O EXPANSION CABLE INTERFACE SIGNALS (AQX)

Expanded Signal	Pin	Direction	True Level	Expanded Signal Function
ERD01/	4	From Remote AQX	Low	LSB (A00)
ERD02/	6			
ERD03/	8			
ERD04/	23			
ERD05/	27			
ERD06/	31			
ERD07/	34			A data bits from the peripheral controller. In a read operation, the 16-bit data word is transferred from the controller to the CPU via the extender unit.
ERD08/	54			
ERD09/	56			
ERD10/	59			
ERD11/	258			
ERD12/	63			
ERD13/	65			
ERD14/	67			
ERD15/	69			
ERD16/	71	From Remote AQX	Low	MSB (A00)
ESD01/	3	To Remote AQX	Low	LSB (A00)
ESD02/	5			
ESD03/	7			
ESD04/	9			
ESD05/	24			
ESD06/	28			
ESD07/	32			
ESD08/	53			A data bits to the peripheral controller. In a write operation the 16-bit data word is transferred from the CPU via the extender unit to the controller.
ESD09/	55			
ESD10/	58			
ESD11/	60			
ESD12/	259			
ESD13/	64			
ESD14/	66			
ESD15/	68			
ESD16/	70	To Remote AQX	Low	MSB (A15)

TABLE 4-2. I/O EXPANSION CABLE INTERFACE SIGNALS (AQX) (Contd)

Expanded Signal	Pin	Direction	True Level	Expanded Signal Function
EADR01/	80	To Remove AQX	Low	LSB (Q00)
EADR02/	74			
EADR03/	73			
EADR04/	72			
EADR05/	25			
EADR06/	30			
EADR07/	35			Q address bits to the peripheral controller. The 9 highest order bits uniquely specify the device. The lower 7 bits specify the station/ function.
EADR08/	81			
EADR09/	82			
EADR10/	83			
EADR11/	84			
EADR12/	85			
EADR13/	86			
EADR14/	87			
EADR15/	88			
EADR16/	89	To Remote AQX	Low	MSB (Q15)
ESSTB-READ/	75	To Remote AQX	Low	Initiates an input transfer of one data word (READ).
EWRITE/	90	To Remote AQX	Low	Intitates an output transfer of one data word (WRITE).
EREPLY/	29	From Remote AQX	Low	Indicates controller acceptance of a computer read or write. The reply drops after the read or write drops (REPLY).
EREJECT/	33	From Remote AQX	Low	Indicates controller response to a computer word or write when the operation cannot be performed (REJECT).
EMR/	253	To Remote AQX	Low	Clears the peripheral controller and the external equipment (MASTER CLEAR).
EPROG-PROT/	91	To Remote AQX	Low	Indicates that this data transfer was initiated by an I/O instruction whose program protect bit is set.
EWEO/	92	To Remote AQX	Low	Indicates that bits 11, 12, 13, 14 and 15 of the address in the Q register are all zero (W=0).
ERPOS01/	26	From Remote AQX	Low	Positions address 01
ESTERM/	255	To Remote AQX	Low	Terminate signal for auto-data transfer
EEXSTOP/	93	From Remote AQX	Low	External signal to stop CPU
EEXMC/ (MC-S/)	94	From Remote AQX	Low	External signal to clear CPU

TABLE 4-2. I/O EXPANSION CABLE INTERFACE SIGNALS (AQX) (Contd)

Expanded Signal	Pin	Direction	True Level	Expanded Signal Function
EEXGO/ (Set SM215/)	95	From Remote AQX	Low	External signal to start CPU
ESPT01†	57	To Remote AQX	Low	Port address line 01
ESSEL01†	78	To Remote AQX	Low	Select line 01
ERDINT01/†	77	From Remote AQX	Low	Data interrupt 01
ERDINT02/†	263	↕	↕	↕
ERDINT03/†	264	↕	↕	↕
ERDINT04/†	265	From Remote AQX	Low	Data interrupt 04
ERPINT01/†	76	From Remote AQX	Low	Program interrupt 01
ERPINT02/†	260	↕	↕	↕
ERPINT03/†	261	↕	↕	↕
ERPINT04†	262	From Remote AQX	Low	Program interrupt 04

†Wired as required for peripheral device

TABLE 4-3. MISCELLANEOUS AQX I/O SIGNALS

Name	Pin	Direction	True Level	Function
ALCNCTIN	271			Not used
ALORIDEIN	272			Not used
ALRQSTIN	266			Not used
ALTDEMAND	270			Not used
AQCNCT†	279	To Remote DMAX	High	AQ connect from remote AQX to remote DMAX
CNCTIN/†	242	From Alternate Local AQX	Low	Connect in from alternate local AQX
CNCTINT/†	97			Not used
CNCTOUT	273			Not used
CNCTOUT/†	252	To Alternate Local AQX	Low	Connect out to alternate local AQX
DEMANDOUT	275			Not used
OVERRIDEOUT	274			Not used
MANORIDE/	269	To Local AQXs	Low	Provides external operation from dual-access switch box
RQSTOUT/	276			Not used

†These signals used only during dual-access mode.

DMA Extender

The DMA extender provides the expansion of the CYBER 18 DMA control and data buses to an I/O expansion unit. The DMA extender can only be used in conjunction with an AQ extender in an expansion chassis. Tables 4-4 through 4-6 tabulate the source and termination points of data for the DMAX. As a component of the I/O expansion, DMA expansion to a maximum of eight DMA interfaces is possible. The DMA extender supports all CYBER 18 DMA devices, conforming to I/O specifications and operating within the transfer rate restriction of 350K words/second. The module drive subsystem has a transfer rate of 605K words/second, so it is not supported. The DMA extender units provide the capability for two separate CPUs to communicate with peripheral devices in the expansion chassis. Only one DMA extender may be active at a time. The AQ-CNCT signal from the AQ extender is used to enable or disable the DMA bus. All dual-access protocol and control is handled by the AQ extender and the DMA extender simply follows under control of the AQ-CNCT signal line. A detailed description of the bus control is discussed in the AQ extender portion of this section.

The DMA extender unit is designed to be a transparent DMA bus extender. Therefore, to the CPU the local DMAX looks like the DMA peripheral, and to the peripherals the remote DMAX looks like the CPU memory interface bus. The local DMAX and remote DMAX can be individually addressed and accept AQ functions. For this purpose the local DMAX has a fully compatible AQ interface; however, the remote DMAX uses only eight bits of the A-register interface. Only the low order eight bits of the SD bus are sampled and only the low order eight bits of the RD bus are driven. This restriction is due to pin limitations that force dual usage of the upper eight bits of the A/Q data lines for DMA request/accept signal processing. In all other respects the DMAX responds like any other A/Q device. Due to the microprogrammed architecture the response time for reply or reject may vary according to the amount of processing required prior to committing to a response. This delay is transparent to the software.

The DMAX is a microprogrammed controller and operates on the data as a path controller and checker. The control within the DMAX is implemented by an internally stored microprogram residing in read-only memory (PROM). The microcode (firmware) is not alterable and is considered to be an integral part of the hardware. The PROM resident microcode consists of 512 instruction words of 32 bits each. The microinstruction controls a 16-bit wide microprocessor comprised of four 4-bit bipolar slices. The microprocessor contains a two-port 16-by-16 addressable RAM and a high-speed ALU. The microinstruction also controls 12-bit microprogram sequencers that perform sequence, return jump, memory access, and branch operations.

The five internal buses listed below provide the data paths and control lines for the DMAX.

- A 16-bit data in three-state bus
- A 16-bit data out three-state bus
- A 16-bit bidirectional memory data bus
- A 24-bit memory address, control, and parity bus
- A 32-bit microinstruction register (MIR) bus

DETAILED FUNCTIONAL DESCRIPTION

AQ EXTENDER

When the override mode of operation is selected it automatically sets the connect flip-flop and connects the CPU AQ extender to the expansion bus. All function output operations are disabled, and an external reject is generated when function outputs are attempted. A status input indicates that the bus is connected and the unit is in the override mode.

The unit remains connected to the expansion bus as long as override mode is selected. Only one CPU extender is to be placed in the override mode when configured in the dual mode of operation.

All transmitters that drive the CPU I/O bus interface between the CPU and expansion chassis, and the expanded I/O bus in the expansion chassis, are open-collector inverting buffer drivers. An active pull-up resistor of 1000 ohms is provided for the interface to the expansion chassis and the expanded bus in the expansion chassis. The CPU provides the pull-up resistor for the CPU I/O bus.

The transmitters on the AQ extender PWA, located in the CPU, are enabled automatically for data transfers and the A/Q extender unit is connected to an expansion bus when manual override mode is selected.

The AQ extender PWA in the expansion chassis is always enabled for I/O transfers. A signal ground connected on backplane pin 99 provides an enable that allows the local AQX to enable all of the transmitters.

All signal receivers on the extender units are level-sensing Schmitt-trigger inverter gates. Line termination networks are provided for each signal line on the paddle board at the receiving end for the interface between the CPU and the expansion chassis. Connection of each receiver to a terminating network is completed when the I/O expansion cable assembly is connected between the paddle boards.

TABLE 4-4. DMA INTERFACE SIGNALS

Signal	Pin	Direction	True Level	Function
DMA-DTM16/	79	To CPU	Low	MSB
DMA-DTM15/	78			
DMA-DTM14/	77			
DMA-DTM13/	76			
DMA-DTM12/	75			
DMA-DTM11/	74			DMA data lines to memory
DMA-DTM10/	73			
DMA-DTM09/	72			
DMA-DTM08/	71			
DMA-DTM07/	70			
DMA-DTM06/	69			
DMA-DTM05/	68			
DMA-DTM04/	67			
DMA-DTM03/	66			
DMA-DTM02/	65			
DMA-DTM01/	64	To CPU	Low	LSB
DFM16	279	From CPU	High	MSB
DFM15	278			
DFM14	277			
DFM13	276			
DFM12	275			
DFM11	274			
DFM09	273			DMA data lines from memory
DFM08	271			
DFM07	270			
DFM06	269			
DFM05	268			
DFM04	267			
DFM03	266			
DFM02	265			
DFM01	264	From CPU	High	LSB

TABLE 4-4. DMA INTERFACE SIGNALS (Contd)

Signal	Pin	Direction	True Level	Function
DMA-MAB20/	259	To CPU	Low	MSB
DMA-MAB19/	47			
DMA-MAB18/	36			
DMA-MAB17/	35			
DMA-MAB16/	258			
DMA-MAB15/	257			
DMA-MAB14/	256			
DMA-MAB13/	255			DMA memory address bits
DMA-MAB12/	254			
DMA-MAB11/	253			
DMA-MAB10/	62			
DMA-MAB09/	61			
DMA-MAB08/	60			
DMA-MAB07/	59			
DMA-MAB06/	58			
DMA-MAB05/	57			
DMA-MAB04/	56			
DMA-MAB03/	55			
DMA-MAB02/	54			
DMA-MAB01/	53	To CPU	Low	LSB
DMAX-MR/	260	To CPU	Low	Priority selected memory cycle request
DMAX-RA/	261	From CPU	Low	Memory cycle request accept
DMA-MDS/	262	From CPU	Low	Memory data strobe
DMA-WRITE	63	To CPU	High	DMA write cycle
DMA-PROT/	232	To CPU	Low	Program protect line
DMA-PFLT/	237	From CPU	Low	Memory protect fault
DMA-MPE/	252	From CPU	Low	Memory parity error
DMA-MAE/	263	From CPU	Low	Memory addressing error
MR/	46	From CPU	Low	Master reset
SLOW-DMA	39	To CPU	High	Slow DMA cycle

TABLE 4-5. I/O EXPANSION CABLE INTERFACE SIGNALS (DMAX)

Signal	Pin	Direction	True Level	Function
DMND-RELEASE/	297	Bi-directional	Low	Unconditionally disables the DMA extender external bus
EXT-ALARM/	299	To Remote DMAX	Low	Indicates external bus parity error, local DMA parity error, protect fault, and/or memory addressing error.
EXT-ADRPAR	10	From Remote DMAX	High	Parity signal for external memory address transmission
EXT-CB6/	295	Bidirectional	Low	DMAX intercontrol bit 6
EXT-CB7/	296	Bidirectional	Low	DMAX intercontrol bit 7
EXT-CTLPAR	9	From Remote DMAX	High	Parity signal for external control line transmission.
EXT-D01	82	Bi-directional	High	LSB
EXT-D02	83			
EXT-D03	84			
EXT-D04	85			
EXT-D05	86			
EXT-D06	87			
EXT-D07	88			16 bit bidirectional data bus. Transfers data to memory from the remote DMAX and data from memory to the remote DMAX
EXT-D08	89			
EXT-D09	90			
EXT-D10	91			
EXT-D11	92			
EXT-D12	93			
EXT-D13	94			
EXT-D14	95			
EXT-D15	96			
EXT-D16	97	Bi-directional	High	MSB
EXT-DATA PAR	98	Bi-directional	High	Parity signal for external data bus transmission.

TABLE 4-5. I/O EXPANSION CABLE INTERFACE SIGNALS (DMAX) (Contd)

Signal	Pin	Direction	True Level	Function
EXT-MAB01/	11	From Remote DMAX	Low	LSB
EXT-MAB02	12			
EXT-MAB03/	13			
EXT-MAB04/	14			
EXT-MAB05/	15			
EXT-MAB06/	16			
EXT-MAB07/	17			
EXT-MAB08/	18			External DMA memory address bits
EXT-MAB09/	19			
EXT-MAB10/	20			
EXT-MAB11/	21			
EXT-MAB12/	22			
EXT-MAB13/	23			
EXT-MAB14/	24			
EXT-MAB15/	25			
EXT-MAB16/	26			
EXT-MAB17/	27			
EXT-MAB18/	28			
EXT-MAB19/	29			
EXT-MAB20/	30	From Remote DMAX	Low	MSB
(EXT-MAE/)†	29	To Remote DMAX	Low	External DMA memory address error
(EXT-MPE/)†	28	To Remote DMAX	Low	External DMA memory parity error
(EXT PFLT/)†	27	To Remote DMAX	Low	External DMA memory protect fault.
EXT-PROT/	31	From Remote DMAX	Low	External program protect line.
EXT-REQUEST/	99	To remote DMAX	Low	Request for synchronization to the remote DMAX.
EXT-STROBE/	298	Bidirectional	Low	Used by the remote DMAX to notify the local DMAX that a DMA request has been made. Used by the local DMAX to notify the remote DMAX that the DMA memory cycle is complete.
EXT-WRITE	32	From Remote DMAX	High	External DMA write signal

†Signal names applicable to remote DMAX only

TABLE 4-6. MISCELLANEOUS DMAX I/O SIGNALS

Signal	Pin	Direction	True Level	Function
DMA1-INT	285	From controllers to remote DMAX	High	Highest priority
DMA2-INT	286			
DMA3-INT	287			
DMA4-INT	288			DMA memory address bit 20 from each I/O expansion chassis DMA controller slot.
DMA5-INT	289			
DMA6-INT	293			
DMA7-INT	294			
DMA8-INT	81		High	Lowest priority
DMA1-MAB18/	80		Low	Highest priority
DMA2-MAB18/	250			
DMA3-MAB18/	242			
DMA4-MAB18/	38			
DMA5-MAB18/	3			DMA memory address bit 18 from each I/O expansion chassis DMA controller slot.
DMA6-MAB18/	213			
DMA7-MAB18/	37			
DMA8-MAB18/	48		Low	Lowest priority
(DMA1-MR/)†	225		Low	Highest priority
(DMA2-MR/)†	228			
(DMA3-MR/)†	230			
(DMA4-MR/)†	233			DMA memory request from each I/O expansion chassis DMA controller slot
(DMA5-MR/)†	235			
(DMA6-MR/)†	238			
(DMA7-MR/)†	240			
(DMA8-MR/)†	243	From controller to remote DMAX	Low	Lowest priority
DMA1-RA/	226	To controller from remote DMAX	Low	Highest priority
DMA2-RA/	229			
DMA3-RA/	231			DMA memory request accept to each I/O expansion chassis DMA controller slot.
DMA4-RA/	234			
DMA5-RA/	236			
DMA6-RA/	239			
DMA7-RA/	241			
DMA8-RA/	244	To controller from remote DMAX	Low	Lowest priority

†Signal names applicable to remote DMAX only

TABLE 4-6. MISCELLANEOUS DMAX I/O SIGNALS (Contd)

Signal	Pin	Direction	True Level	Function
REMOTE/	227	From I/O expansion backplane (wired to ground) to remote DMAX	Low	Indicates to the DMAX that it is plugged into the I/O expansion chassis.
XINT1/	4	From controller to remote DMAX	Low	Interrupts from each I/O expansion chassis DMA controller via slot Y and interrupt jumpers
XINT2/	5			
XINT3/	6			
XINT4/	7			
XINT5/	41			
XINT6/	42			
XINT7/	43			
XINT8/	44	From controller to remote DMAX	Low	

Active high three-state buffer devices are used to provide faster rise-times on the READ-SSTB/ and WRITE/ signal lines. These devices are turned off at the expansion bus by the local extender AQ-CNCT signal line. The pull-up required during the three-state transition times of high-impedence output (no drive) is provided by the termination assembly (resistor block) on slot D of the expansion chassis backplane.

The AQ extender unit has the capability to echo back data/address patterns for maintenance testing. The test feature is enabled/disabled by program control for either the local extender unit, located in the CPU, or the unit located in the expansion chassis. The data/address values that are echoed back to the CPU are the output values sent to the extender unit.

When echo test is selected, the two-input multiplexer and data holding register are enabled. The first write operation to any address, other than the AQ extender device address, transfers the data value through the multiplexer and loads it into the holding register. The first read operation gates the contents of the holding register to the CPU. The test cycle flip-flop toggles to its opposite state, ready to select address echo. The interrupt lines are set to an active state at completion of the read operation.

The second write operation to any address, other than the AQ extender device address, transfers the address through the multiplexer and loads the address value into the holding register. The second read operation gates the address in the holding register to the CPU data read lines. At the end of the read operation, the test cycle flip-flop is toggled to its opposite state, selecting data echo for the next sequence. The interrupt lines are set to their off state.

Succeeding cycles of read/write operations alternately echo back data values, then address values with interrupt lines on/off. When the echo test feature is disabled, the multiplexer and data holding register are disabled, and the test cycle flip-flop is set to the data position.

DMA EXTENDER

Figure 5-2 contains a block diagram of the DMA extender including the major function blocks and data flow of the two DMAX PWAs. The following discussion refers to figure 5-2.

The interface signals between the CPU and the local DMAX are shown on the left margin of the block diagram.

The right margin shows the interface signals between the remote DMAX and the I/O expansion chassis. For clarity, not all of the interface signals are shown in the block diagram. The local DMAX and the remote DMAX PWAs are physically identical and interchangeable; however, they display some different functional characteristics depending on their location. The presence of a ground at backpanel pin 227 of the I/O expansion chassis and the absence of a ground at pin 227 of the CPU slot directs the PWA's logic and firmware to determine the appropriate functional characteristics. These function differences are shown in the block diagram.

Interconnection between the two PWAs is accomplished by two identical I/O expansion cables plugged into the two paddle boards connected to the backplanes of the respective chassis (shown in the center of the diagram).

Address Compare

The address compare logic used in both PWAs compares WE0 and ADR05 through ADR11 to equipment address 1 (hardwired on the PWA) and the station address selected by the station address select switches. An equal compare selects the DMAX PWA to receive diagnostic functions. The station addresses of the two PWAs must not be equal. WE0 and ADR05 through ADR11 are supplied to the I/O expansion chassis through the AQ extender.

A Transmitters and Receivers

The A-register transmitters transmit RD01/ through RD16/ and the A-register receivers receive SD01/ through SD16/ on the local DMAX PWA. Only RD01/ through RD08/ and SD01/ through SD08/ are transmitted and received on the remote DMAX PWA. The RD transmitters and SD receivers are active only during diagnostic AQ functions. RD01/ through RD08/ and SD01/ through SD08/ are supplied to the I/O expansion chassis through the AQ extender.

DMA-MR Latch and DMA-RA Demultiplexer

The remote DMAX receives eight DMA memory request lines (DMA1-MR/ through DMA8-MR/) from eight DMA controller slots in the I/O expansion chassis. These lines are wired in place of SD09/ through SD16/, which are not used in the remote DMAX. The eight DMA-MR lines are sent to a priority encoder and demultiplexed as eight DMA request accept lines (DMA1-RA/ through DMA8-RA/) that are wired back to their respective eight DMA controller slots in the I/O expansion chassis.

By this process a memory request from one of the DMA controllers results in an immediate request accept from the remote DMAX. The firmware senses that a memory request has been made and the data transfer process is initiated.

Function Receivers

The four function lines, ADR01/ through ADR04/, are received when the firmware detects the SELECTED signal from the address compare logic. The firmware then gates these lines into the DIN (data input) bus to be processed.

Microprocessor (ALU + RAM)

The microprocessor block in the local and remote DMAX PWAs consists of four 4-bit slices connected to produce a 16-bit wide ALU with a two-port 16-by-16 RAM. It performs the arithmetic and logical functions required by the firmware. Nine lines from the microinstruction register control the functions of the microprocessor.

Microsequencer + Stack

The microsequencer is 12 bits wide, consisting of three 4-bit microprogram sequencers. The microsequencer controls the firmware program addressing to provide sequence and jump capability. It also is capable of stacking up to four return addresses to facilitate subroutine nesting.

Micromemory

Each DMAX PWA contains the same microcode in four 512 x 8-bit PROMs, making a 512 x 32 bit word micromemory. Twelve lines from the microsequencer address the memory to select 32 data bits (MM00 through MM31) that are presented to the microinstruction register.

Multiplexer

The 2-to-1 multiplexer multiplexes the upper 16 bits of the micromemory word with the lower 16 bits of the micromemory word to the 16-bit wide data in bus (DIN01 through DIN16).

Microinstruction Register

The microinstruction register is a 32-bit latch with 32 standard TTL outputs (MIR00 through MIR31) and 16 three-state outputs (DIN01 through DIN16) tied to the DIN (data input) bus.

Strobes and Enables

Twentythree strobes and enables are used in data path and other control.

Memory Address and Control Path

The DMA memory address lines are driven by the controllers in the I/O expansion chassis and are received and latched by the remote DMAX. The 16 least significant memory address lines are fed into the parity generator/checker where odd parity is generated for these 16 lines (OPAR MABUS) The four most significant memory address lines, DMA-WRITE, and DMA PROT/ are fed into the parity generator/checker and an odd parity control (OPAR CTL) signal is generated.

The 24 bits of memory address, control, and parity are transmitted from the remote DMAX through the remote DMAX paddle board, I/O expansion cable, local DMAX paddle board, and received and latched at the local DMAX.

The memory address lines and control lines are fed through the local DMAX parity generator/checker. The result is compared to the parity lines generated at the remote DMAX and parity status is sent to the DIN bus through the parity status buffer to be analysed by the firmware.

The DMA memory address lines, DMA-PROT/, and DMA-WRITE are passed on to the CPU memory interface through the DMA memory address and control transmitters.

Bidirectional Memory Data Path

Data from memory (DFM01/ through DFM16/) is received and latched on the local DMAX. The 16 data lines are fed into the parity generator/checker and odd parity (OPAR BUS) is generated. The outputs from the latches are tied to the bidirectional data bus and the 16 data signals plus OPAR BUS are presented to the EXT D01 through D16 transmitters, where they are transmitted through the I/O expansion cable and paddle boards to the EXT D01 through D16 and control latches on the remote DMAX. The 16 data signals are fed into the remote DMAX parity generator/checker and the result is compared with the transmitted parity signal and presented to the DIN bus through the parity status buffer. The 16 data lines are then transmitted to the DMA controller in the I/O expansion chassis.

Data to memory (DTM01/ through DTM16/) is received and latched on the remote DMAX. The 16 data lines are fed into the parity generator/checker and odd parity (OPAR BUS) is generated. The outputs from the latches are tied to the bidirectional data bus and the 16 data signal plus OPAR BUS are presented to the EXT D01 through D16 transmitters, where they are transmitted through the I/O expansion cable and paddle boards to the EXT D01 through D16 and control latches on the local DMAX. The 16 data signals are fed into the local DMAX parity generator/checker and the result is compared with the transmitted parity signal and presented to the DIN bus through the parity status buffer. The 16 data lines are then transmitted to the CPU memory.

DMAX FIRMWARE FLOWCHART

The generalized flowchart (figure 4-1) illustrates the normal firmware sequence of events. The sequence is initiated by a master reset from the CPU and continues through the transparent operating mode of the local and remote DMAX PWAs during normal DMA data transfer. The solid connecting lines illustrate the flow of events and the dotted lines indicate DMA interface control signals.

The master reset initiates self test in both the local and remote DMAX PWAs. If an error occurs during self test the firmware halts at the location of the failure and causes the DMAX to become inoperable. If no error occurs during self test the DMAX in the CPU (local DMAX) and the DMAX in the expansion chassis (remote DMAX) are initialized and synchronized. To synchronize the two DMAX PWAs the local DMAX sends an external request (EXT-REQUEST/) to the remote DMAX and the remote DMAX sends an external alarm (EXT-ALARM). When the external alarm is received by the local DMAX it removes the external request. This signals the remote DMAX to remove the external alarm signal. When these signals are removed the two DMAX PWAs begin to idle. The DMAX PWAs are now in the transparent mode and ready to accept data transfer requests from the controllers.

The remote DMAX idle loop constantly tests for a memory request from one of the DMA controllers in the I/O expansion chasis. When a memory request (DMAX-MR/) is received from the controller, the hardware generates a pseudo request accept (DMAX-RA/) to answer the controller. The remote DMAX firmware then generates an EXT-STROBE/ that notifies the idling local DMAX that a memory data transfer is requested by a controller in the I/O expansion chassis. The remote DMAX firmware then sets the direction of the data bus determined by the WRITE/ signal from the controller. The local DMAX firmware responds to EXT-STROBE/ by sending a memory request (DMAX-MR/) to the CPU memory interface.

The local DMAX firmware then sets the direction of the data bus as determined by the EXT-WRITE/ sent by the remote DMAX. When DMAX-RA/ and DMA memory data strobe (DMA-MDS/) are returned from the CPU memory interface, the local DMAX firmware generates an EXT-STROBE. This EXT-STROBE notifies the remote DMAX to send a DMA-MDS/ to the controller. At the completion of the DMA data transfer each DMAX firmware returns to idle and awaits initiation of the next DMA data transfer.

DUAL-MODE ACCESS

The dual-mode access contains no active elements. Therefore, there is no theory of operation for this unit.

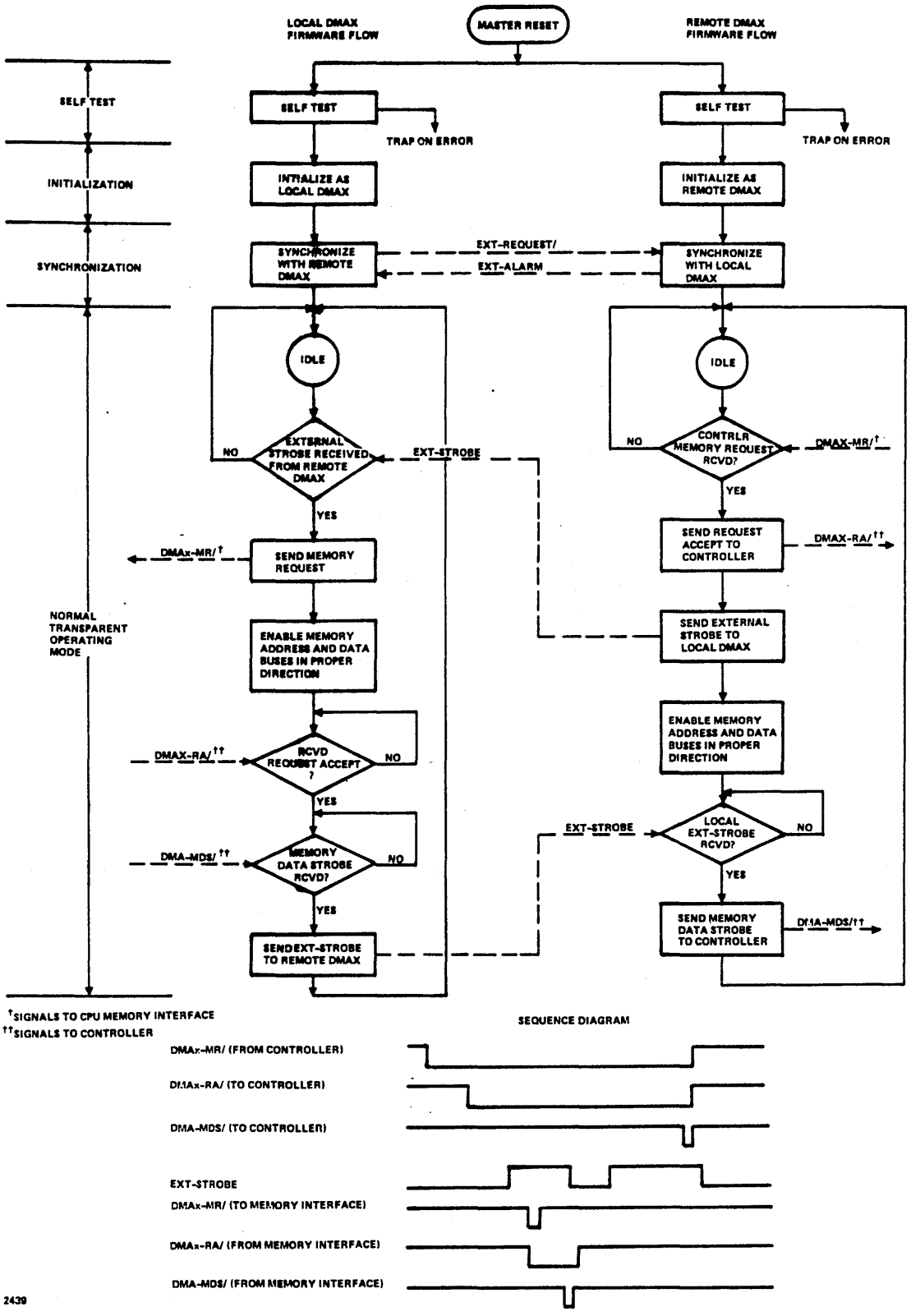


Figure 4-1. DMAX Firmware Flowchart

DIAGRAMS 5

This section contains the logic diagrams for the AQ and DMA printed wiring assemblies of the I/O expansion subsystems and schematic diagrams applicable to associated assemblies. Table 5-1 provides an index of drawings applicable to the IOX equipments.

TABLE 5-1. IOX SUBSYSTEM DIAGRAMS

Equipment	Part Number	Description	Page
AT314-A	88929800	AQX Logic Diagram, 5WAT	†
AT314-B	88929801	AQX Logic Diagram, 8HYT	†
	96870520	Local Paddle Board Logic Diagram, 8HST	†
	96870550	Remote Paddle Board Logic Diagram, 8HWT	†
AT314-C/D	96720465	AQX Logic Diagram, 9LHT	5-3
AT314-E	96890790	AQX Logic Diagram, 9MKT	5-13
AT314-C/D/E	96720469	Local Paddle Board Logic Diagram, 9LKT	5-23
	96720467	Remote Paddle Board Logic Diagram, 9LJT	5-29
BU272-A	96752134	DMAX Logic Diagram, 7GGT	5-35
	96890780	DMAX Logic Diagram, 9MJT	5-59
	96870541	Local Paddle Board Logic Diagram, 8HVT	5-81
	96870540	Remote Paddle Board Logic Diagram, 8HUT	5-83

†Refer to the field print package for this equipment.

1(TD)

		TITLE LOGIC - AQ - MOS, I/O EXTENDER 9LHT	PREFIX DR	DOCUMENT NO. 96720465	REV. 01
	CODE IDENT 88132	FIRST USED ON CYBER 18		SHEET 1 OF 1	

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS21719	CL B. PRC RELEASED				

NOTES:

DETACHED LISTS

Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 1 of 9)

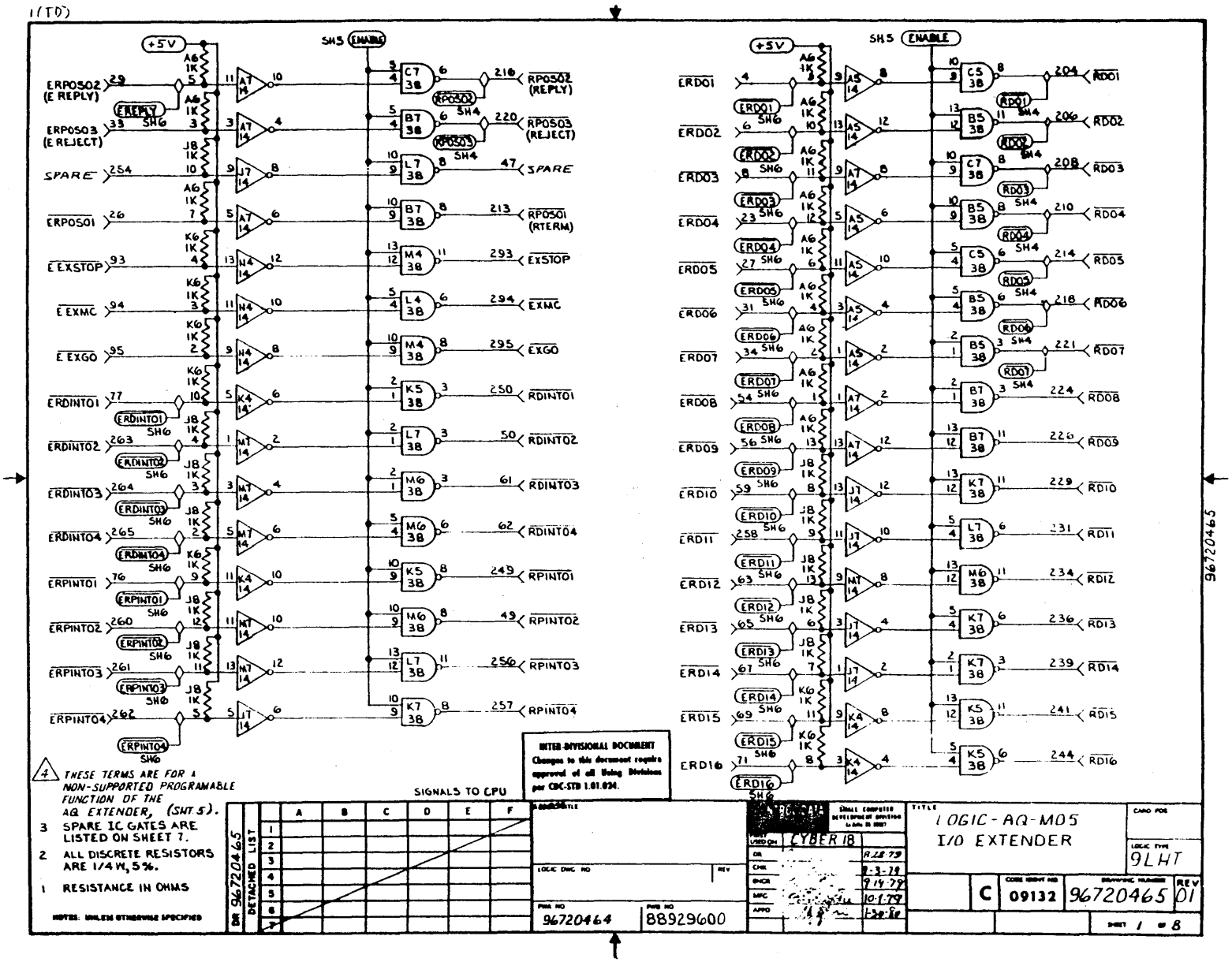


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 2 of 9)

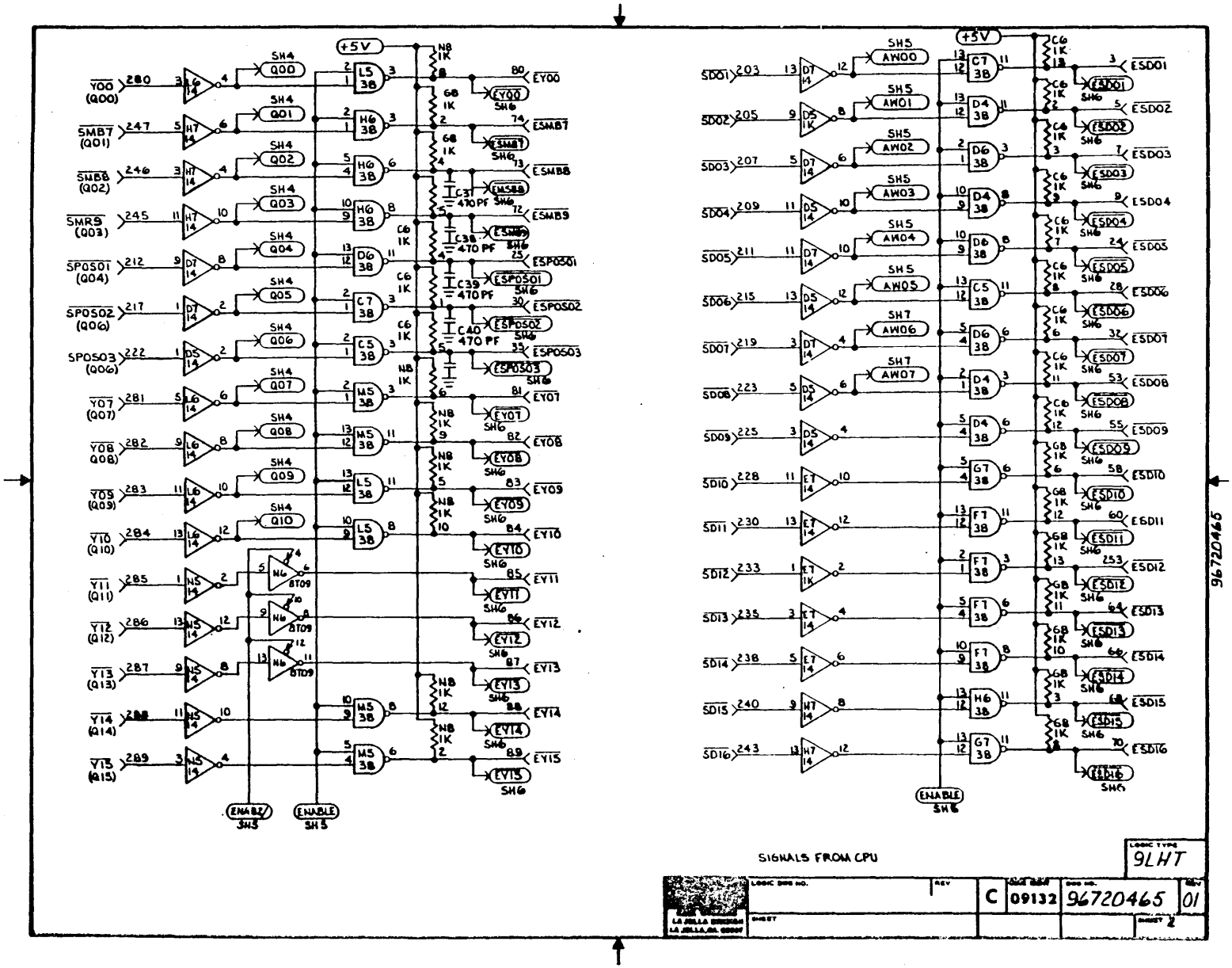


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 3 of 9)

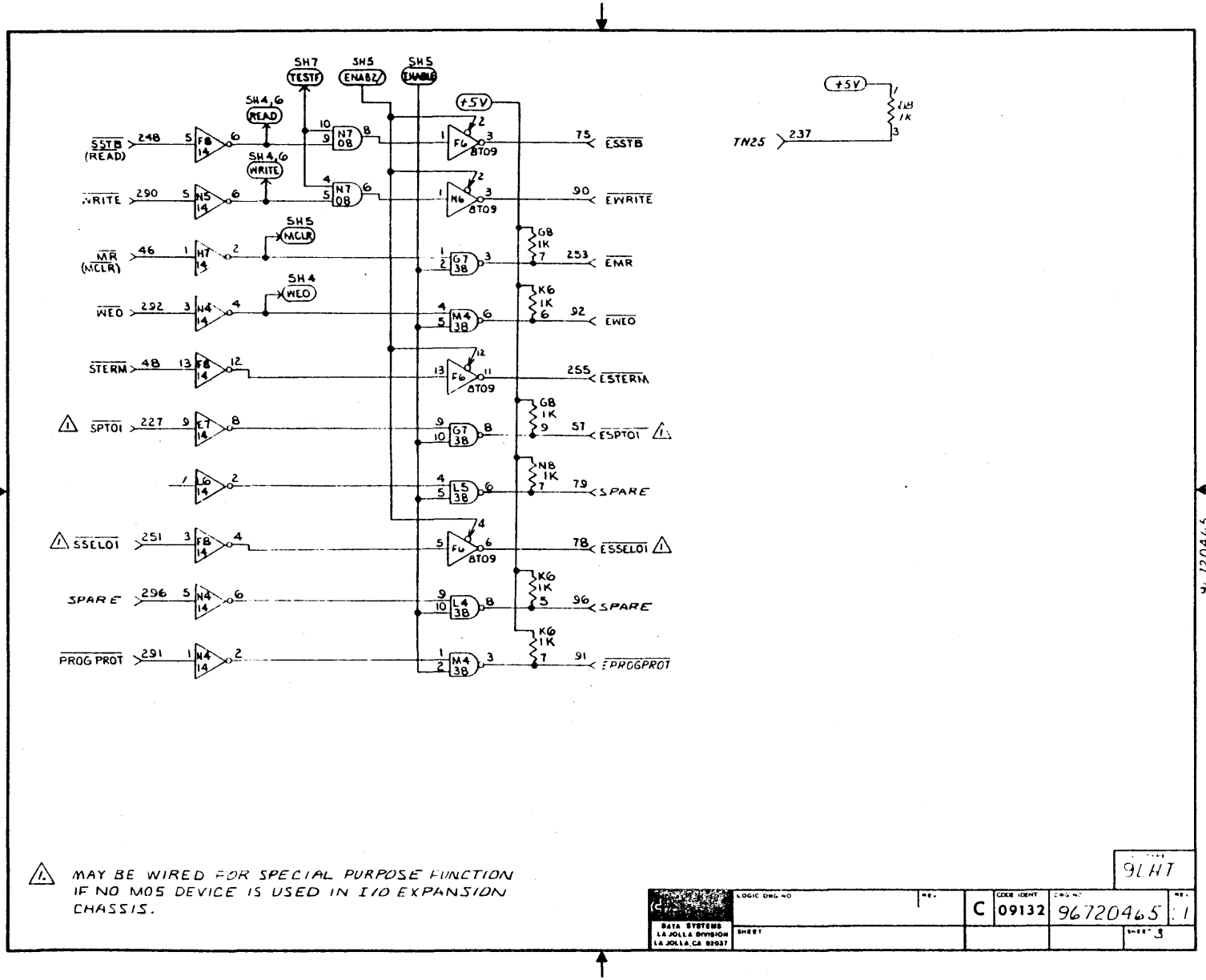


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 4 of 9)

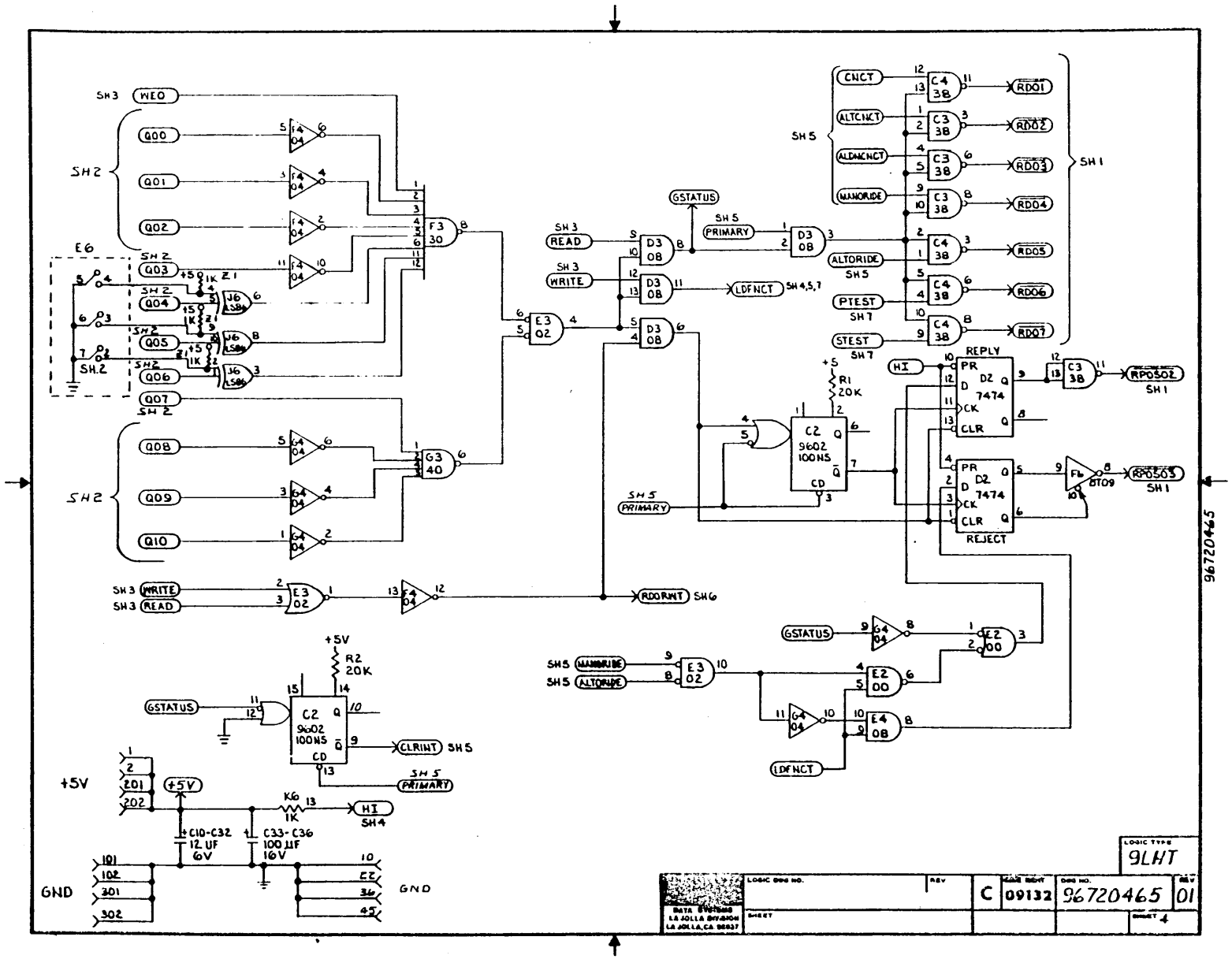


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 5 of 9)

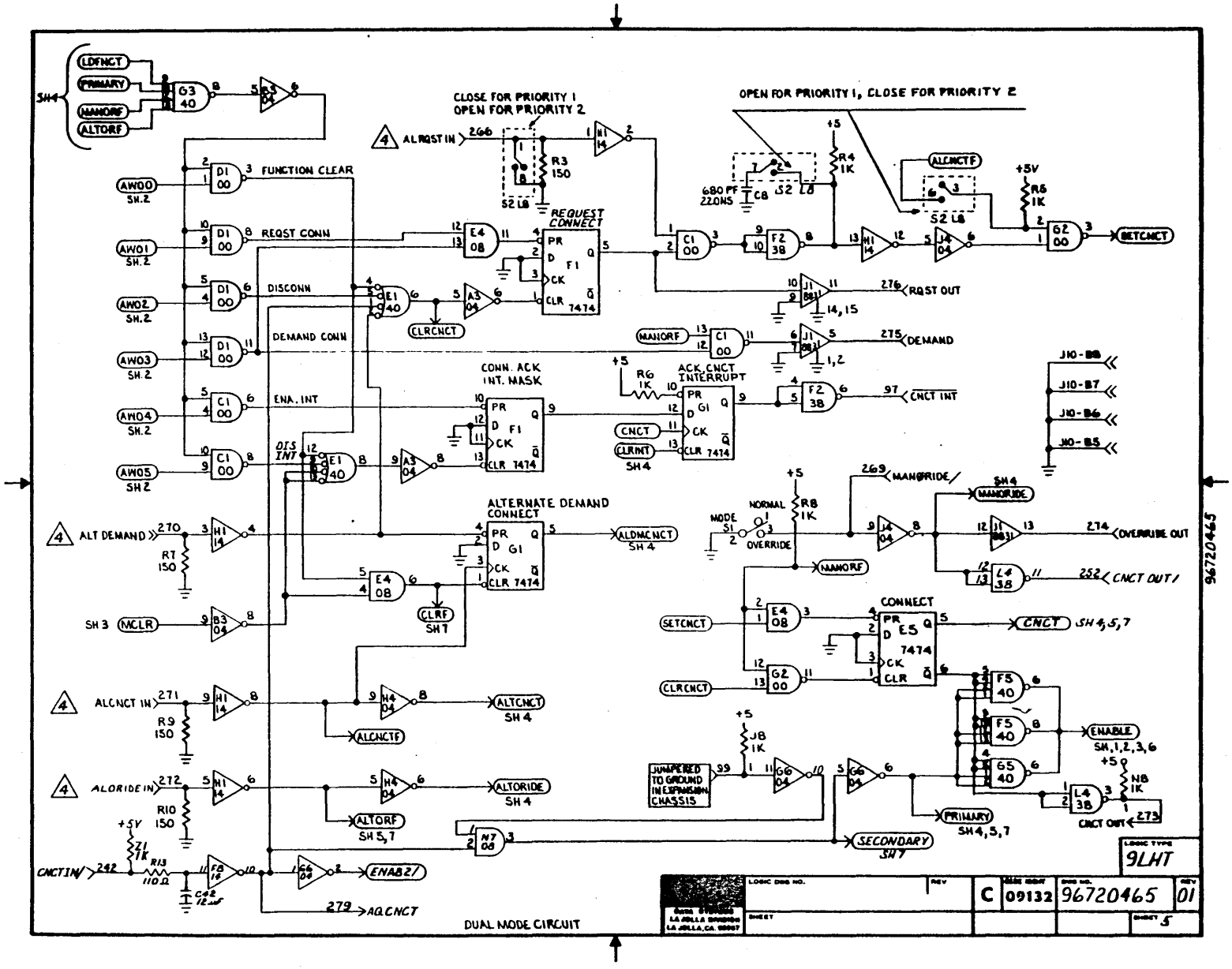


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 6 of 9)

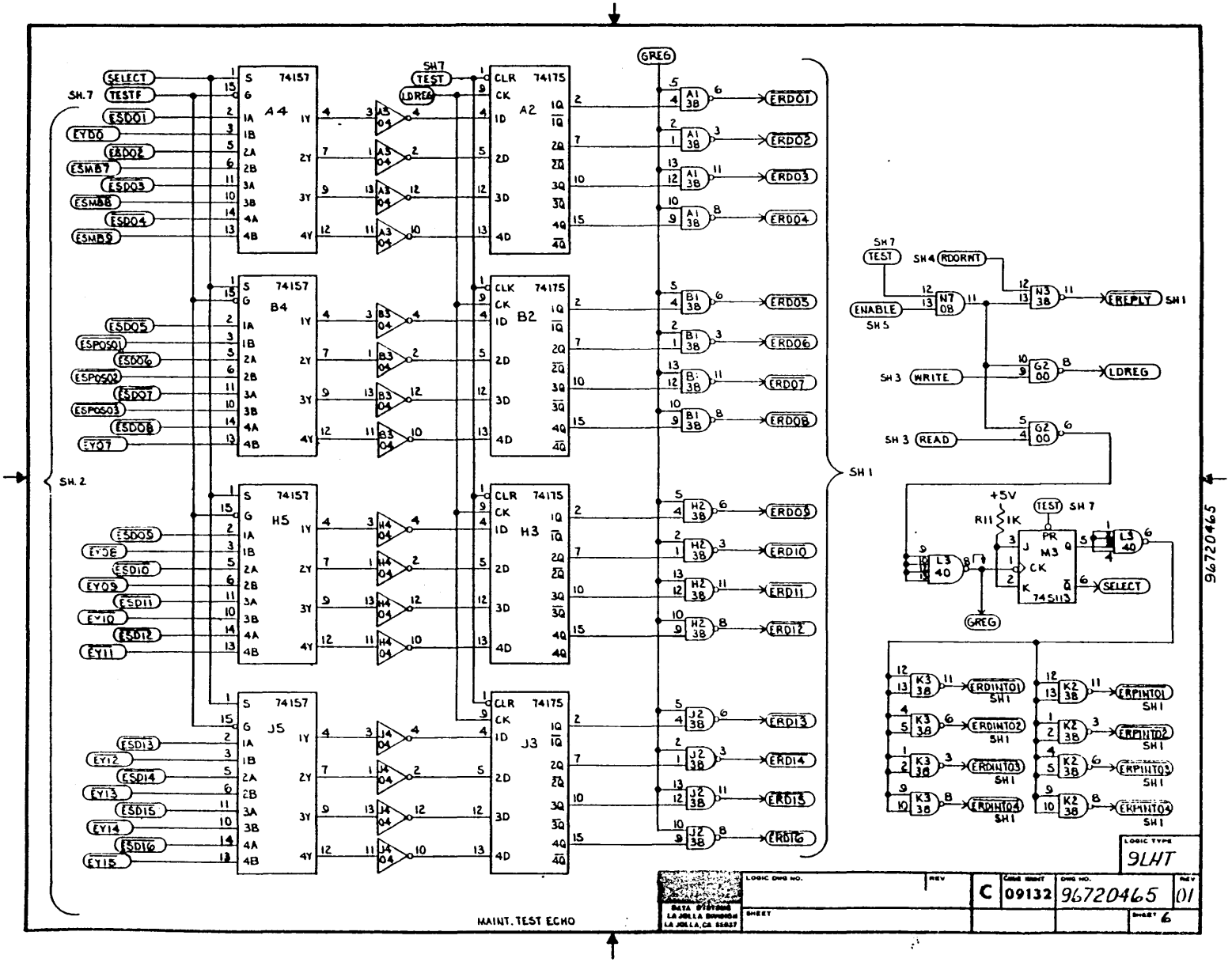


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 7 of 9)

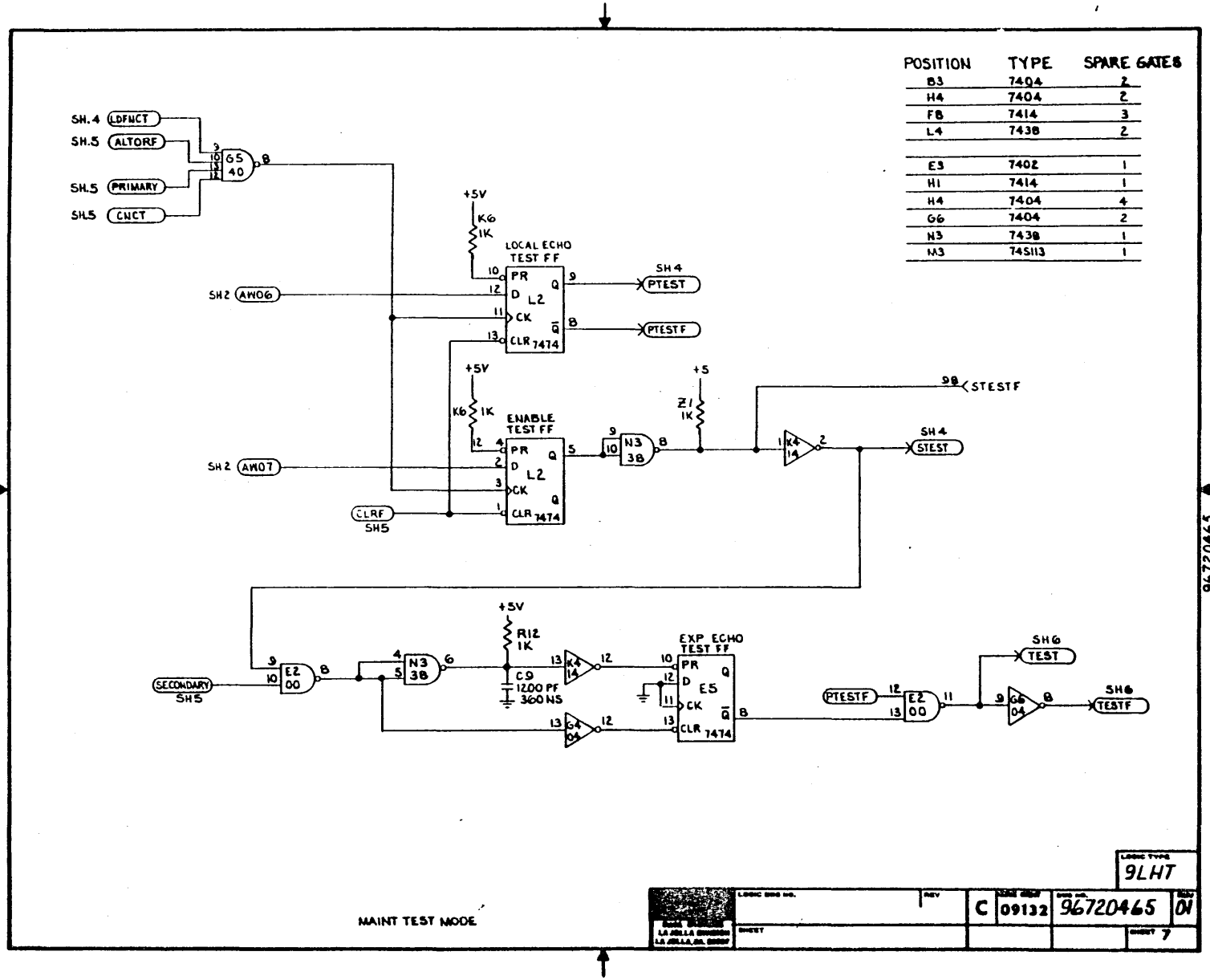
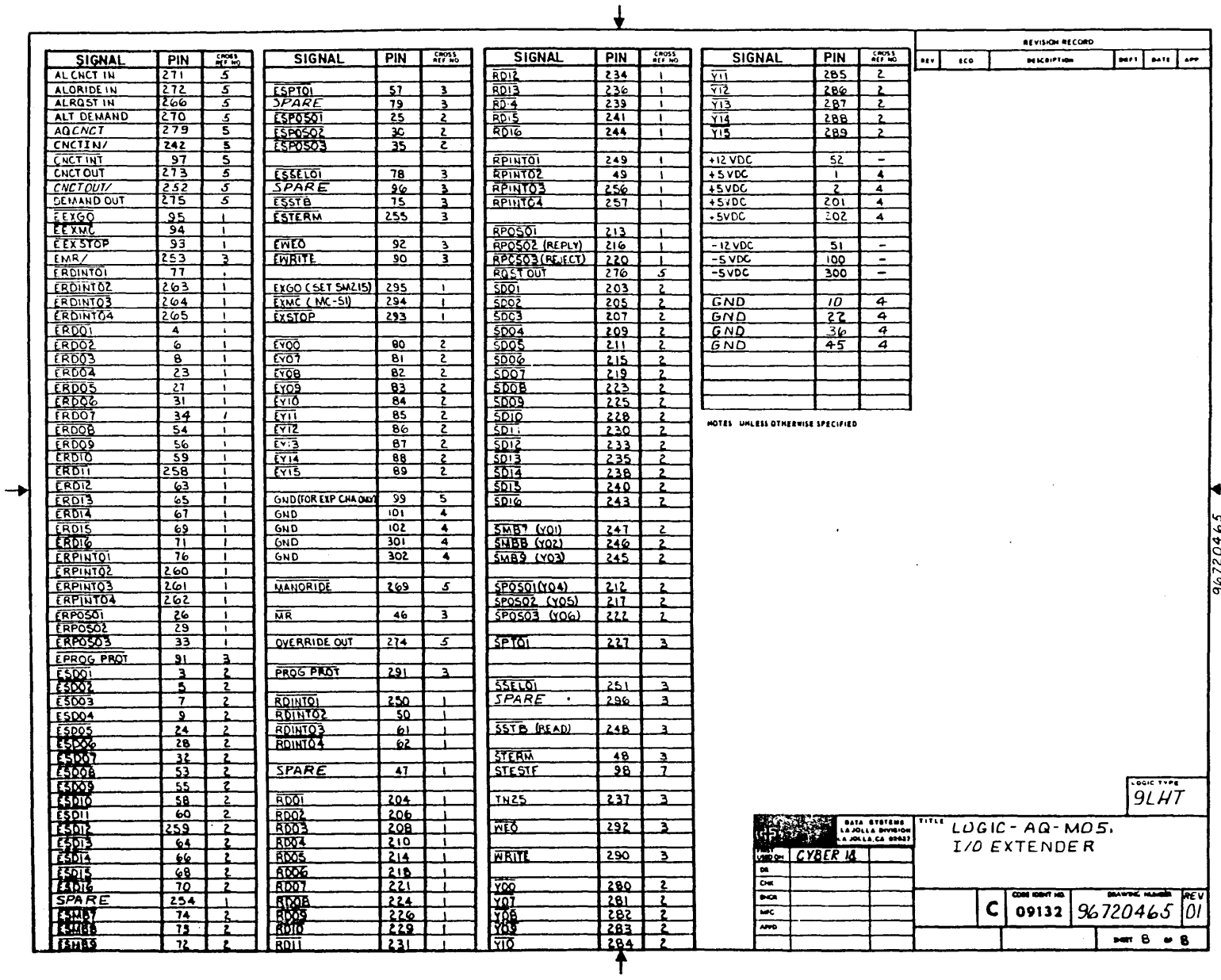


Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 8 of 9)



SIGNAL	PIN	CROSS REF NO
AL CNCT IN	271	5
ALORIDE IN	272	5
ALRQST IN	266	5
ALT DEMAND	270	5
AQCNCT	279	5
CNCTIN/	242	5
CNCT INT	97	5
CNCT OUT	273	5
CNCTOUT/	252	5
DEMAND OUT	275	5
EEXGO	95	1
EEXMC	94	1
EEXSTOP	93	1
EMR/	253	3
ERDINTO1	77	1
ERDINTO2	263	1
ERDINTO3	264	1
ERDINTO4	265	1
ERDO1	4	1
ERDO2	6	1
ERDO3	8	1
ERDO4	23	1
ERDO5	27	1
ERDO6	31	1
ERDO7	34	1
ERDO8	54	1
ERDO9	56	1
ERDIO	59	1
ERDI1	258	1
ERDI2	63	1
ERDI3	65	1
ERDI4	67	1
ERDI5	69	1
ERDI6	71	1
ERPINTO1	76	1
ERPINTO2	260	1
ERPINTO3	261	1
ERPINTO4	262	1
ERPOSO1	26	1
ERPOSO2	29	1
ERPOSO3	33	1
EPROG PROT	91	3
ESDO1	3	2
ESDO2	5	2
ESDO3	7	2
ESDO4	9	2
ESDO5	24	2
ESDO6	28	2
ESDO7	32	2
ESDO8	53	2
ESDO9	55	2
ESDIO	58	2
ESDI1	60	2
ESDI2	259	2
ESDI3	64	2
ESDI4	66	2
ESDI5	68	2
ESDI6	70	2
SPARE	254	1
ESMB7	74	2
ESMB8	73	2
ESMB9	72	2

SIGNAL	PIN	CROSS REF NO
ESPTO1	57	3
SPARE	79	3
ESPOSO1	25	2
ESPOSO2	30	2
ESPOSO3	35	2
ESSELO1	78	3
SPARE	96	3
ESSTB	75	3
ESTERM	255	3
EWEO	92	3
EWRITE	90	3
EXGO (SET SMZ15)	295	1
EXMC (MC-SI)	294	1
EXSTOP	293	1
EYOO	80	2
EYO7	81	2
EYO8	82	2
EYO9	83	2
EYIO	84	2
EYII	85	2
EYI2	86	2
EYI3	87	2
EYI4	88	2
EYI5	89	2
GND (FOR EXP CHA ONLY)	99	5
GND	101	4
GND	102	4
GND	301	4
GND	302	4
MANORIDE	269	5
MR	46	3
OVERRIDE OUT	274	5
PROG PROT	291	3
RDINTO1	250	1
RDINTO2	50	1
RDINTO3	61	1
RDINTO4	62	1
SPARE	47	1
RDO1	204	1
RDO2	206	1
RDO3	208	1
RDO4	210	1
RDO5	214	1
RDO6	218	1
RDO7	221	1
RDO8	224	1
RDO9	226	1
RDIO	229	1
RDII	231	1

SIGNAL	PIN	CROSS REF NO
RDI2	234	1
RDI3	236	1
RDI4	239	1
RDI5	241	1
RDI6	244	1
RPINTO1	249	1
RPINTO2	49	1
RPINTO3	256	1
RPINTO4	257	1
RPOSO1	213	1
RPOSO2 (REPLY)	216	1
RPOSO3 (REJECT)	220	1
RQST OUT	276	5
SDO1	203	2
SDO2	205	2
SDO3	207	2
SDO4	209	2
SDO5	211	2
SDO6	215	2
SDO7	219	2
SDO8	223	2
SDO9	225	2
SDIO	228	2
SDI1	230	2
SDI2	233	2
SDI3	235	2
SDI4	238	2
SDI5	240	2
SDI6	243	2
SMB7 (YO1)	247	2
SMB8 (YO2)	246	2
SMB9 (YO3)	245	2
SPOSO1 (YO4)	212	2
SPOSO2 (YO5)	217	2
SPOSO3 (YO6)	222	2
SPTO1	227	3
SSELO1	251	3
SPARE	296	3
SSTB (READ)	248	3
STERM	48	3
STESTF	98	7
TN25	237	3
WEO	292	3
WRITE	290	3
YOO	280	2
YO7	281	2
YO8	282	2
YO9	283	2
YIO	284	2

SIGNAL	PIN	CROSS REF NO
YII	285	2
YI2	286	2
YI3	287	2
YI4	288	2
YI5	289	2
+12 VDC	52	-
+5 VDC	1	4
+5 VDC	2	4
+5 VDC	201	4
+5 VDC	202	4
-12 VDC	51	-
-5 VDC	100	-
-5 VDC	300	-
GND	10	4
GND	22	4
GND	36	4
GND	45	4

NOTES UNLESS OTHERWISE SPECIFIED

REVISION RECORD					
REV	ECO	DESCRIPTION	DRFT	DATE	APP

DR	CYBER 18
CHK	
ENGR	
MFG	
APPD	

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037

TITLE: LOGIC - AQ - MOS I/O EXTENDER

LOGIC TYPE: 9LHT

SIZE	CODE IDENT NO	DRAWING NUMBER	REV
C	09132	96720465	01

SHEET 8 OF 8

96720465

Figure 5-1. AQ Extender (AQX) Logic Diagram, 9LHT (Sheet 9 of 9)

119201-2

SIGNAL	PIN	CROSS REF NO.	SIGNAL	PIN	CROSS REF NO.	SIGNAL	PIN	CROSS REF NO.	SIGNAL	PIN	CROSS REF NO.
ALCNCT IN	271	0105				RD12/	234	0101	ADR12/	285	0102
ALØRIDE IN	272	0105	ESPT01/	57	0103	RD13/	236	0101	ADR13/	286	0102
ALRQST IN	266	0105	SPARE	79	0103	RD14/	239	0101	ADR14/	287	0102
ALT DEMAND	270	0105	EADR05/	25	0102	RD15/	241	0101	ADR15/	288	0102
AQCNCT	279	0105	EADR06/	30	0102	RD16/	244	0101	ADR16/	289	0102
CNCTIN/	242	0105	EADR07/	35	0102						
CNCTINT/	97	0105				RPINT01/	249	0101	+12VDC	52	----
CNCTØUT	273	0105	ESSEL01/	78	0103	RPINT02/	49	0101	+5VDC	1	0100
CNCTØUT/	252	0105	SPARE	96	0103	RPINT03/	256	0101	+5VDC	2	0100
DEMANDØUT	275	0105	ESSTB/	75	0103	RPINT04/	257	0101	+5VDC	201	0100
EEXGØ/	95	0101	ESTERM/	255	0103				+5VDC	202	0100
EEXMC/	94	0101				RTERM/	213	0101			
EEXSTØP/	93	0101	EWEO/	92	0103	REPLY/	216	0101	-12VDC	51	----
EMR/	253	0103	EWRITE/	90	0103	REJECT/	220	0101	-5VDC	100	----
ERDINT01/	77	0101				RQSTØUT	276	0105	-5VDC	300	----
ERDINT02/	263	0101	EXGØ (SET SM215)	295	0101	SD01/	203	0102			
ERDINT03/	264	0101	EXMC/(MC-S/)	294	0101	SD02/	205	0102	GND	10	0100
ERDINT04/	265	0101	EXSTØP	293	0101	SD03/	207	0102	GND	22	0100
ERD01/	4	0101				SD04/	209	0102	GND	36	0100
ERD02/	6	0101	EADR01/	80	0102	SD05/	211	0102	GND	45	0100
ERD03/	8	0101	EADR09/	81	0102	SD06/	215	0102			
ERD04/	23	0101	EADR09/	82	0102	SD07/	219	0102			
ERD05/	27	0101	EADR10/	83	0102	SD08/	223	0102			
ERD06/	31	0101	EADR11/	84	0102	SD09/	225	0102			
ERD07/	34	0101	EADR12/	85	0102	SD10/	228	0102			
ERD08/	54	0101	EADR13/	86	0102	SD11/	230	0102			
ERD09/	56	0101	EADR14/	87	0102	SD12/	233	0102			
ERD10/	59	0101	EADR15/	88	0102	SD13/	235	0102			
ERD11/	258	0101	EADR16/	89	0102	SD14/	238	0102			
ERD12/	63	0101				SD15/	240	0102			
ERD13/	65	0101	GND(FØR EXP CHA ØNLY)	99	0105	SD16/	243	0102			
ERD14/	67	0101	GND	101	0104						
ERD15/	69	0101	GND	102	0104	ADR02/	247	0102			
ERD16/	71	0101	GND	301	0104	ADR03/	246	0102			
ERPINT01/	76	0101	GND	302	0104	ADR04/	245	0102			
ERPINT02/	260	0101									
ERPINT03/	261	0101	MANØRIDE/	269	0105	ADR05/	212	0102			
ERPINT04/	262	0101				ADR06/	217	0102			
ERPØS01/	26	0101	MR/	46	0103	ADR07/	222	0102			
ERPØS02/	29	0101									
ERPØS03/	33	0101	ØVERRIDE ØUT	274	0105	SPT01/	227	0103			
EPRØGPRØT/	91	0103									
ESD01/	3	0102	PRØG PRØT/	291	0103						
ESD02/	5	0102				SSEL01/	251	0103			
ESD03/	7	0102	RDINT01/	250	0101	SPARE	296	0103			
ESD04/	9	0102	RDINT02/	50	0101						
ESD05/	24	0102	RDINT03/	61	0101	READ-SSTB/	248	0103			
ESD06/	28	0102	RDINT04/	62	0101						
ESD07/	32	0102				STERM/	48	0103			
ESD08/	53	0102	SPARE	47	0101	STEST/	98	0107			
ESD09/	55	0102									
ESD10/	58	0102	RD01/	204	0101	TN25	237	0103			
ESD11/	60	0102	RD02/	206	0101						
ESD12/	259	0102	RD03/	208	0101	WEO/	292	0103			
ESD13/	64	0102	RD04/	210	0101						
ESD14/	66	0102	RD05/	214	0101	WRITE/	290	0103			
ESD15/	68	0102	RD06/	218	0101						
ESD16/	70	0102	RD07/	221	0101	ADR01/	280	0102			
SPARE	264	0101	RD08/	224	0101	ADR08/	281	0102			
EADR02/	74	0102	RD09/	226	0101	ADR09/	282	0102			
EADR03/	73	0102	RD10/	229	0101	ADR10/	283	0102			
EADR04/	72	0102	RD11/	231	0101	ADR11/	284	0102			

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	APP
A	DS22036	CL A RELEASE	[illegible]	[illegible]	[illegible]
B	DS22050	SEE ECO	KB	[illegible]	[illegible]

NØTES: UNLESS ØTHERWISE SPECIFIED

1. RESISTANCE IN ØHMS.
2. ALL DISCRETE RESISTØRS ARE 1/4W,5%.
3. SPARE I.C. GATES ARE LISTED ØN SHEET 3.
4. (△) THESE TERMS ARE FØR A NØN-SUPPØRTED PRØGRAMMABLE FUNCTION OF THE AQ EXTENDER (SHEET 8).
5. (△) MAY BE WIRED FØR SPECIAL PURPØSE FUNCTIØN IF NØ M05 DEVICE IS USED IN I/Ø EXPANSIØN CHASSIS (SHEET 6).
6. INT. CKT. STANDARD +5V & GND PINS ARE AS FØLLØWS:

	+5V	GND
14 PIN DIP	14	7
16 PIN DIP	16	8
8 PIN SIP	8	--

7. NAMES ØF EXTERNAL PINS IN PARENTHESIS REFER TO I/Ø EXPANSIØN BACKPLANE PØINTS WHEN THIS PWA IS IN THE I/Ø EXPANSIØN CHASSIS.

INTER DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1 01.024.

AAL030

LØGIC TYPE: 9MK1

CONTROL DATA CORPORATION — DATA SYSTEMS, LA JOLLA, CA

FIRST USED ON	AT314	
DR		5-9-80
CHK		7-9-80
ENGR		7-9-80
MFG		
APPD		7-10-80

TITLE: LØGIC DIAGRAM- AQ EXTENDER

SIZE: C | CODE IDENT: 09132 | DWG NO.: 96890790

N/A96890490 | SHEET 1 ØF 10

96890790

Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 1 of 10)

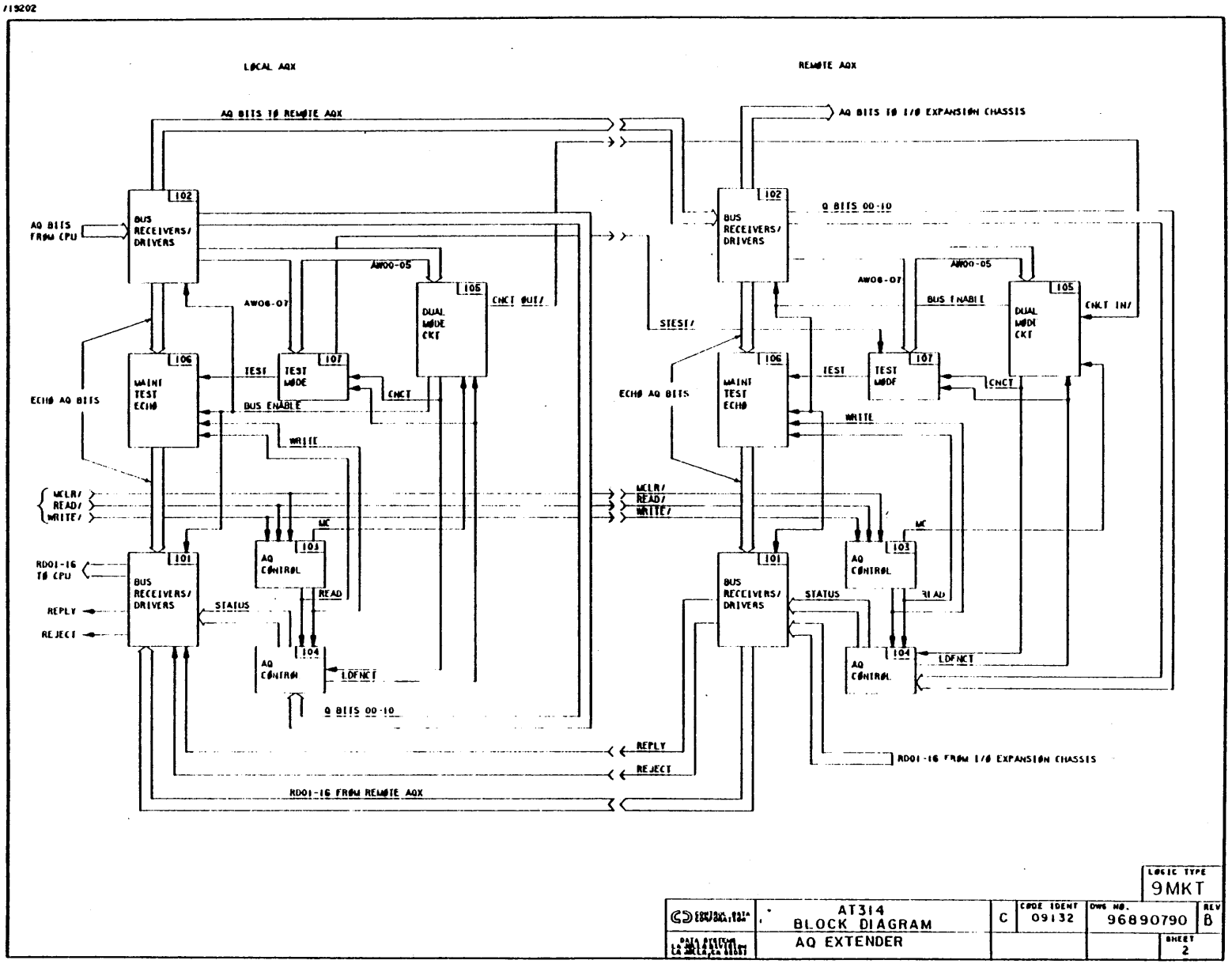
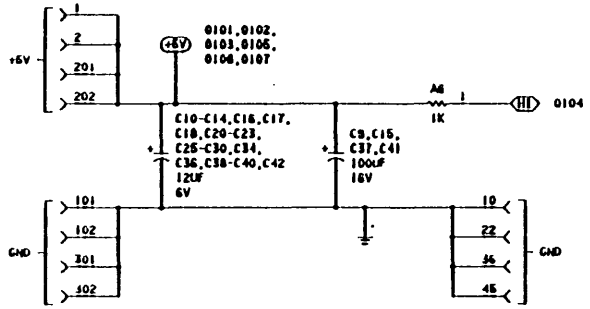


Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 2 of 10)



REFERENCE DESIGNATOR CHART		
DESC	HIGHEST NO. USED	NUMBERS NOT USED
CAPS	C43	—
RES	R11	—
SWITCH	SW3	—

SPARE GATES		
TYPE	LOCATION	NO.
7404	A3	2
7404	D4	2
7404	H3	1
7404	N2	4
7414	A5	1
7414	B6	1
7414	J5	2
7414	K4	1
7414	L6	1
7414	M7	1
7414	N4	2
7438	D5	2
7438	L4	1
7402	E3	1
745113	M2	1
74532	M1	2

SPARE RESISTORS		
VALUE	LOCATION	NO.
1K	C6	1
1K	D8	2
1K	K6	0
1K	K8	1
1K	M4	4
1K	M8	1
1K	N8	1

LOGIC TYPE 9MKT

	POWER/GROUND,SPARE GATES	C	CODE IDENT 09132	DWG NO. 96890790	REV B
	AQ EXTENDER		0100		SHEET 3

Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 3 of 10)

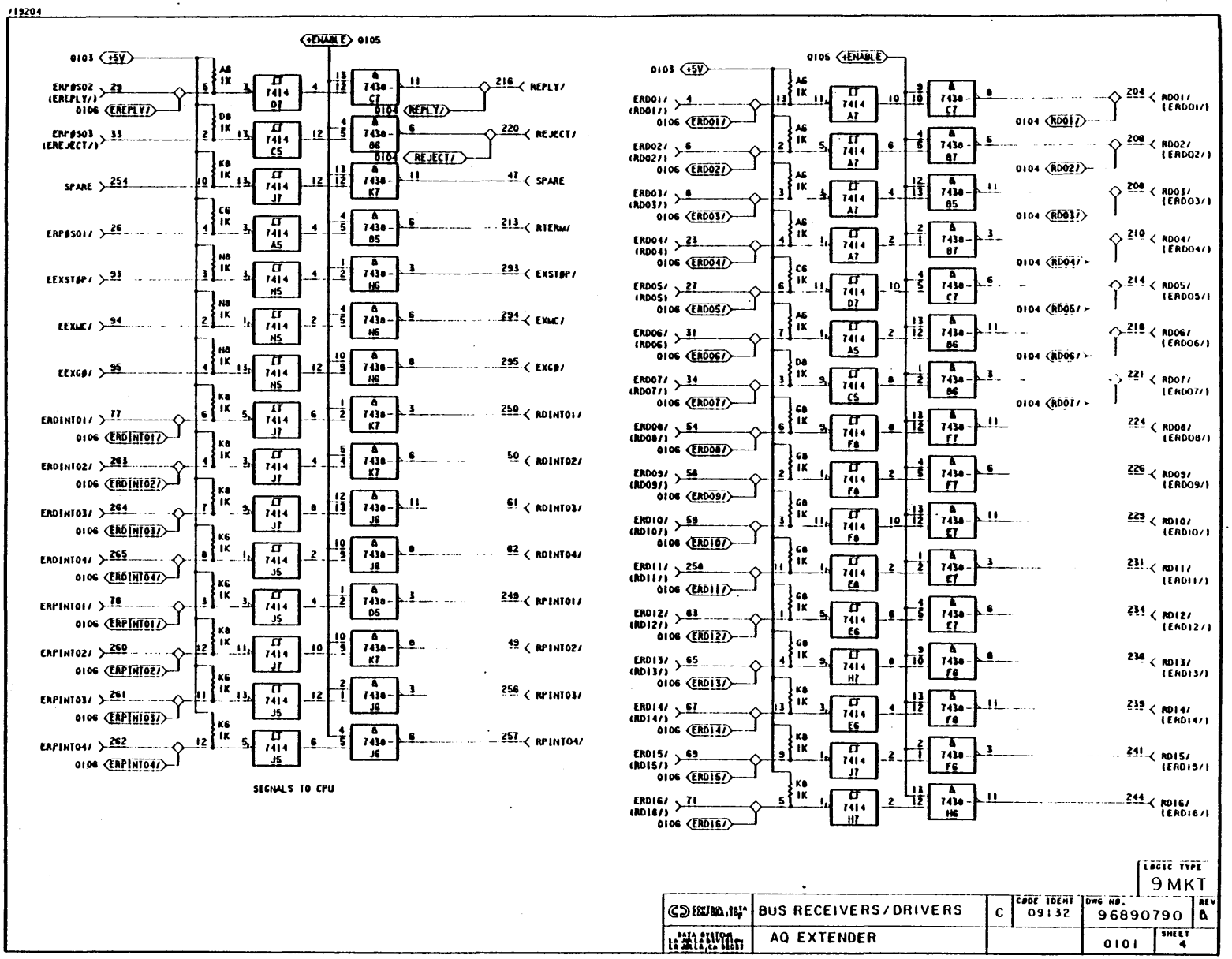


Figure 5-2 AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 4 of 10)

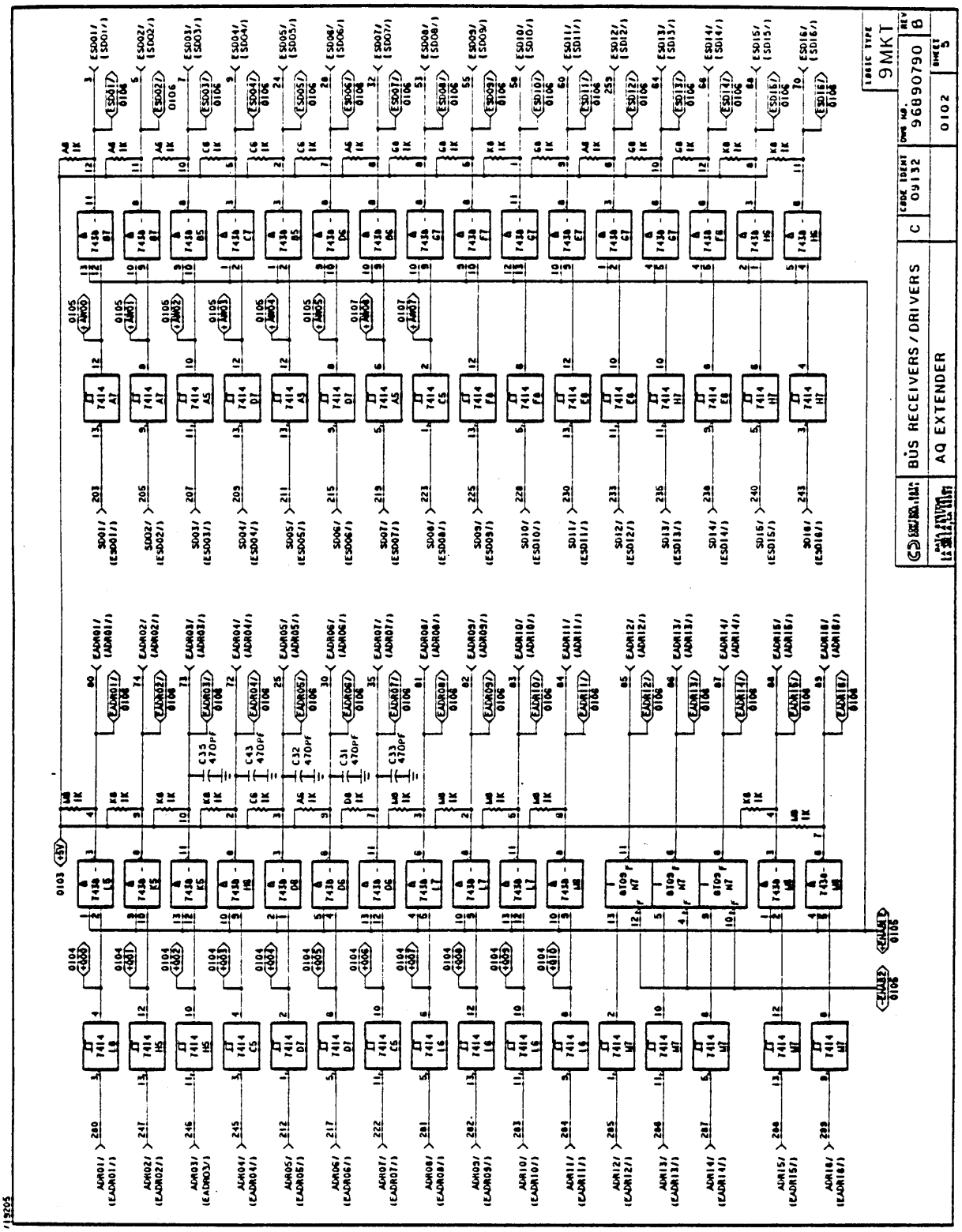
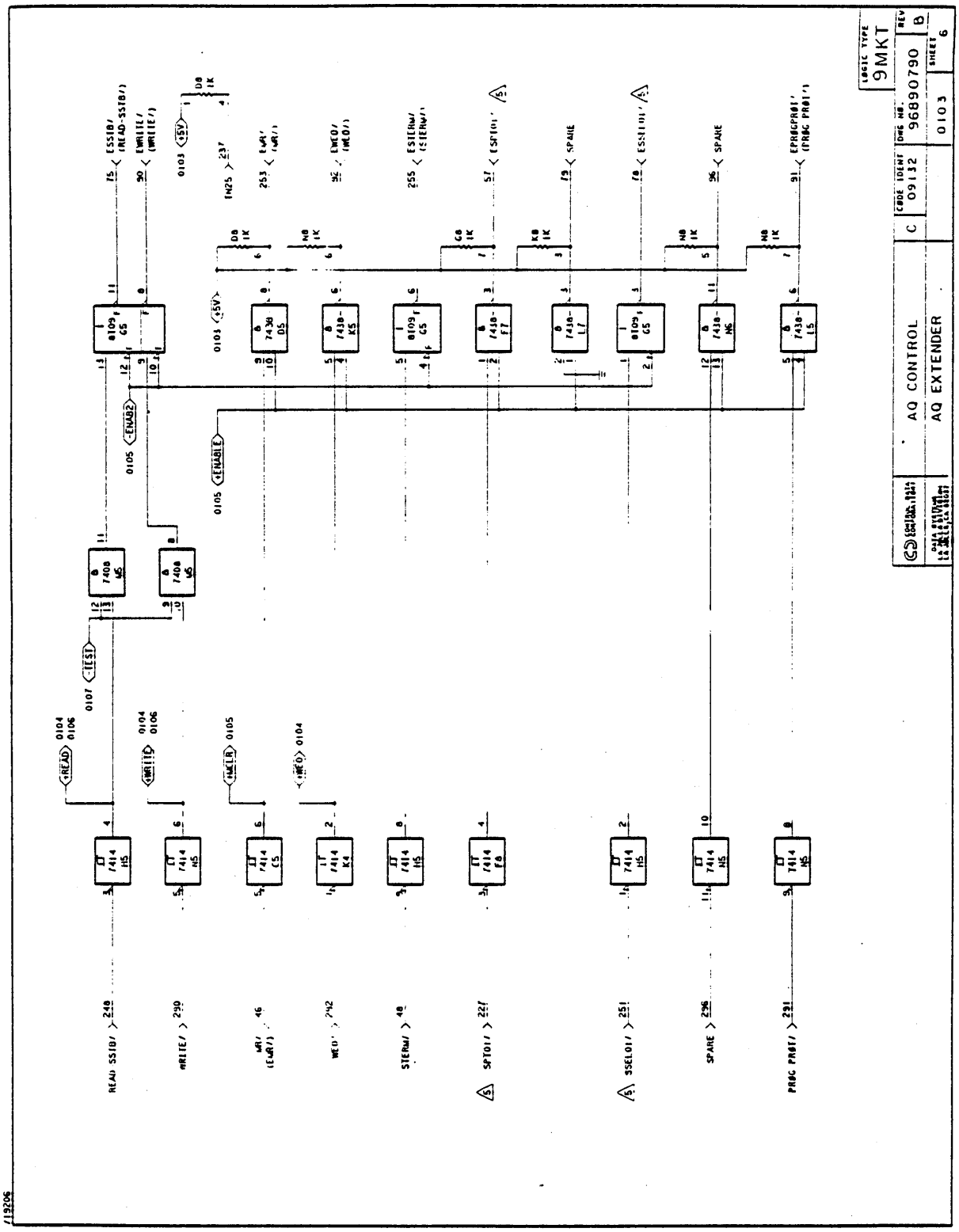


Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 5 of 10)


AQ CONTROL
AQ EXTENDER
9MKT
96890790
0103
09132
READ SSIB/
WRITE/
SPARE
PROG PROT/
SSELOI/
SPTOII
SIENW/
WEO/
ENABLE
ENAB2
TEST
READ
WRITE
MCLR
WEO
SPARE
EPROGPROT/
(PROG PROT)
(WRITE/)
(READ-SSIB/)

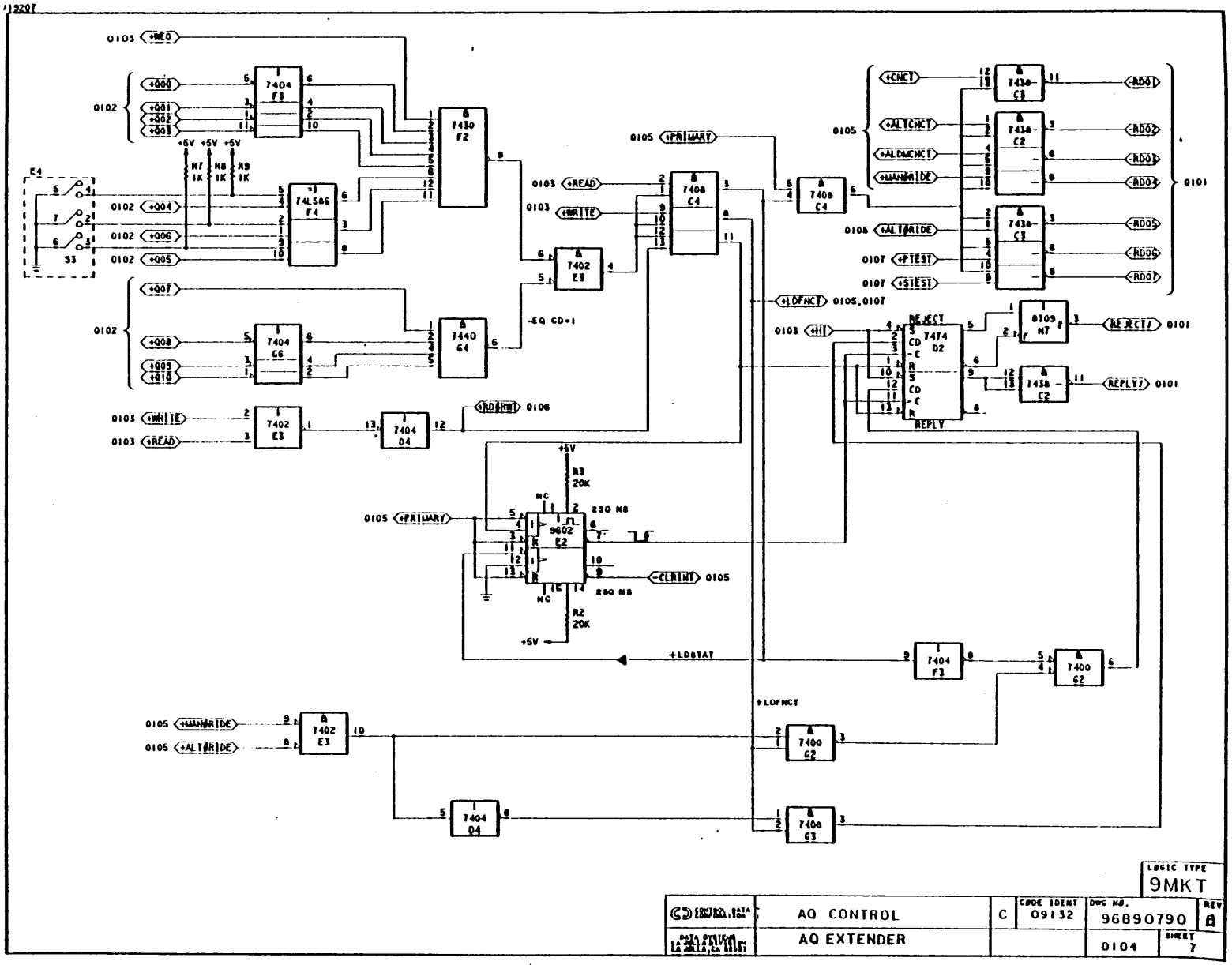


Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 7 of 10)

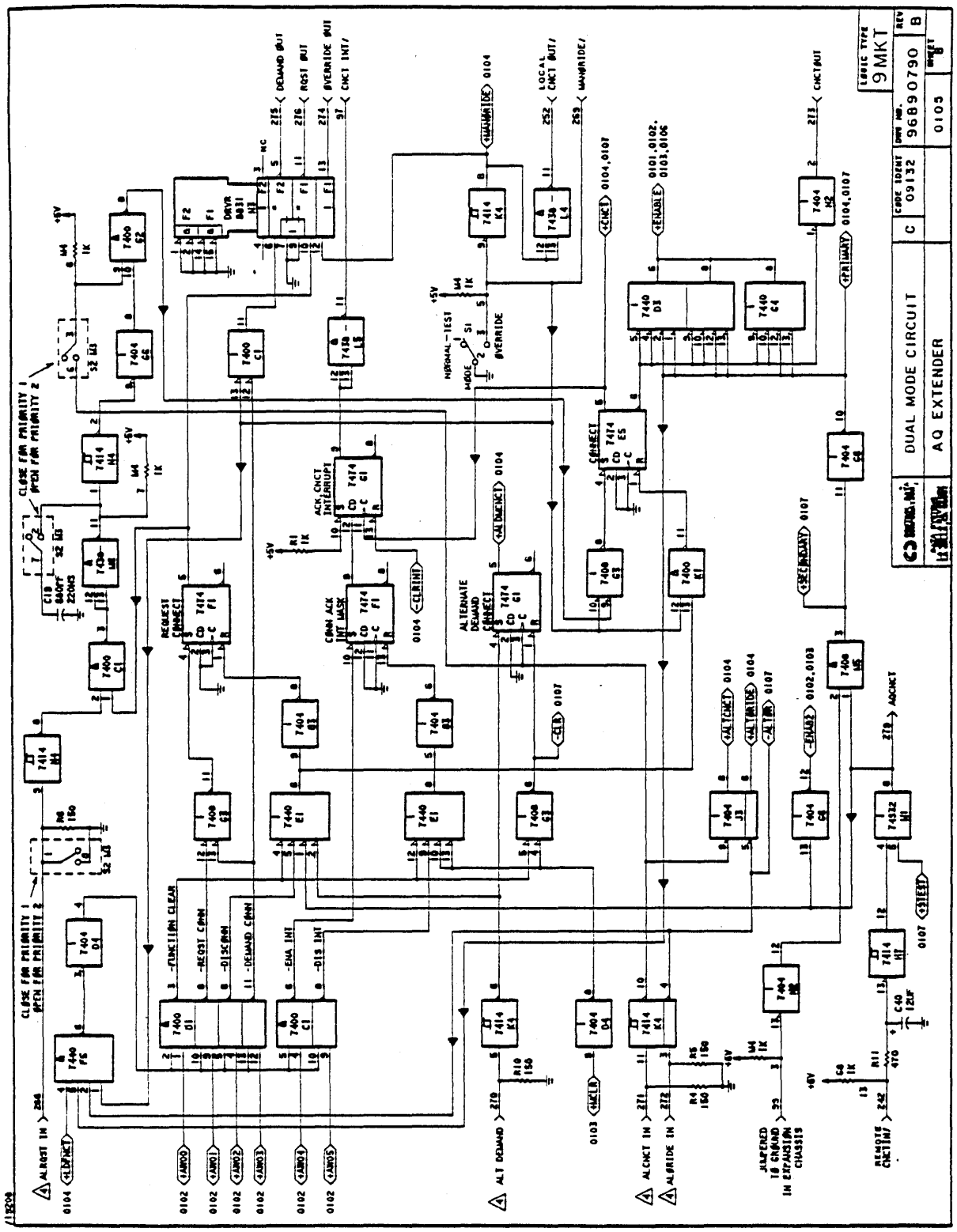


Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 8 of 10)

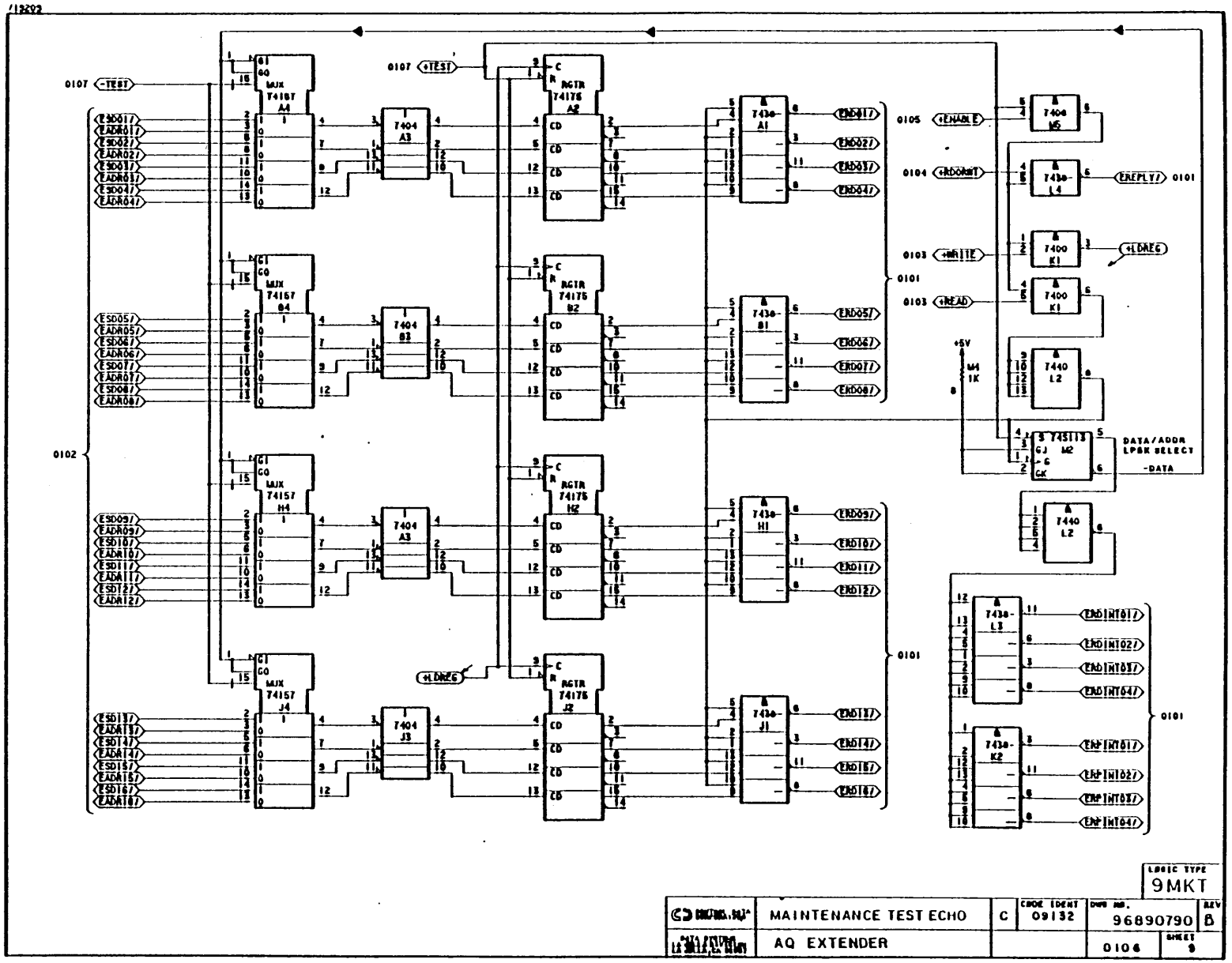
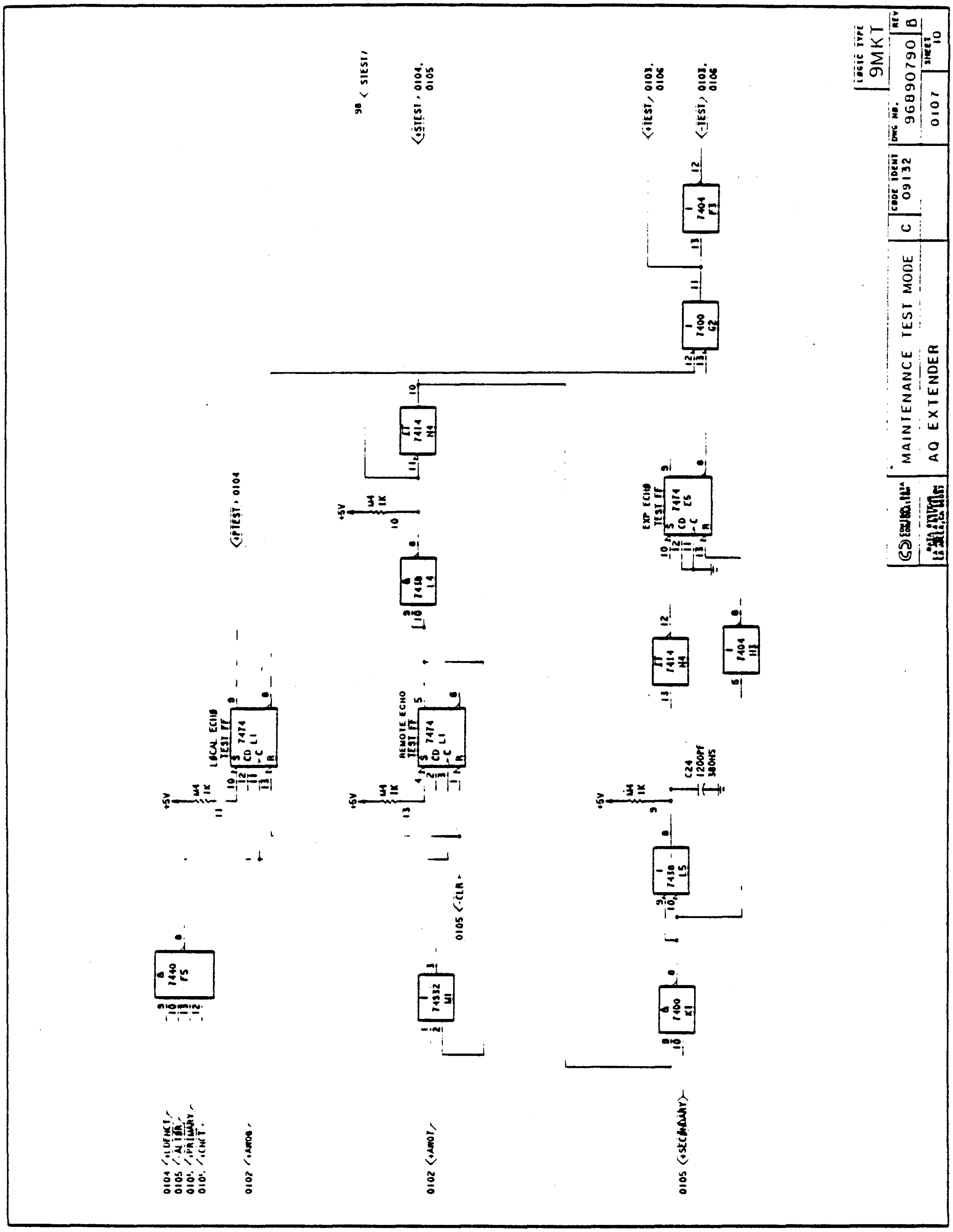


Figure 5-2. AQ Extender (AQX) Logic Diagram, 9MKT (Sheet 9 of 10)


LOGIC TYPE
9MKT
DWG NO.
96890790
REV
B
SHEET
10
0107
CODE IDENT
09132
C
MAINTENANCE TEST MODE
AQ EXTENDER
LOCAL ECHO TEST FF
REMOTE ECHO TEST FF
EXP ECHO TEST FF

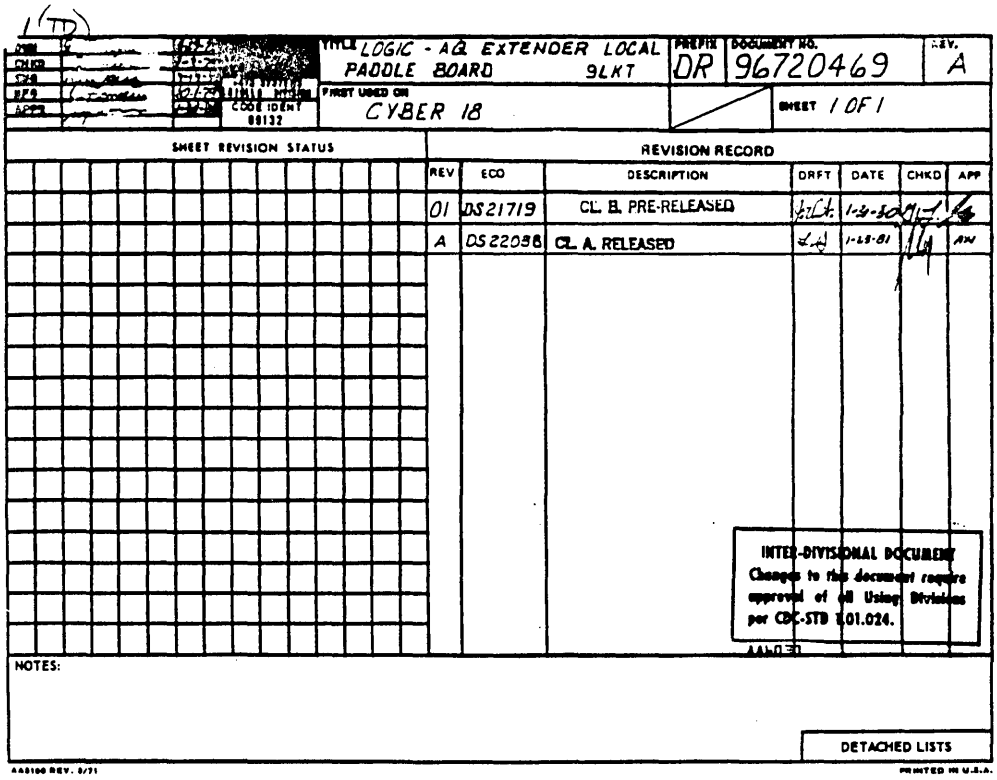


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 1 of 6)

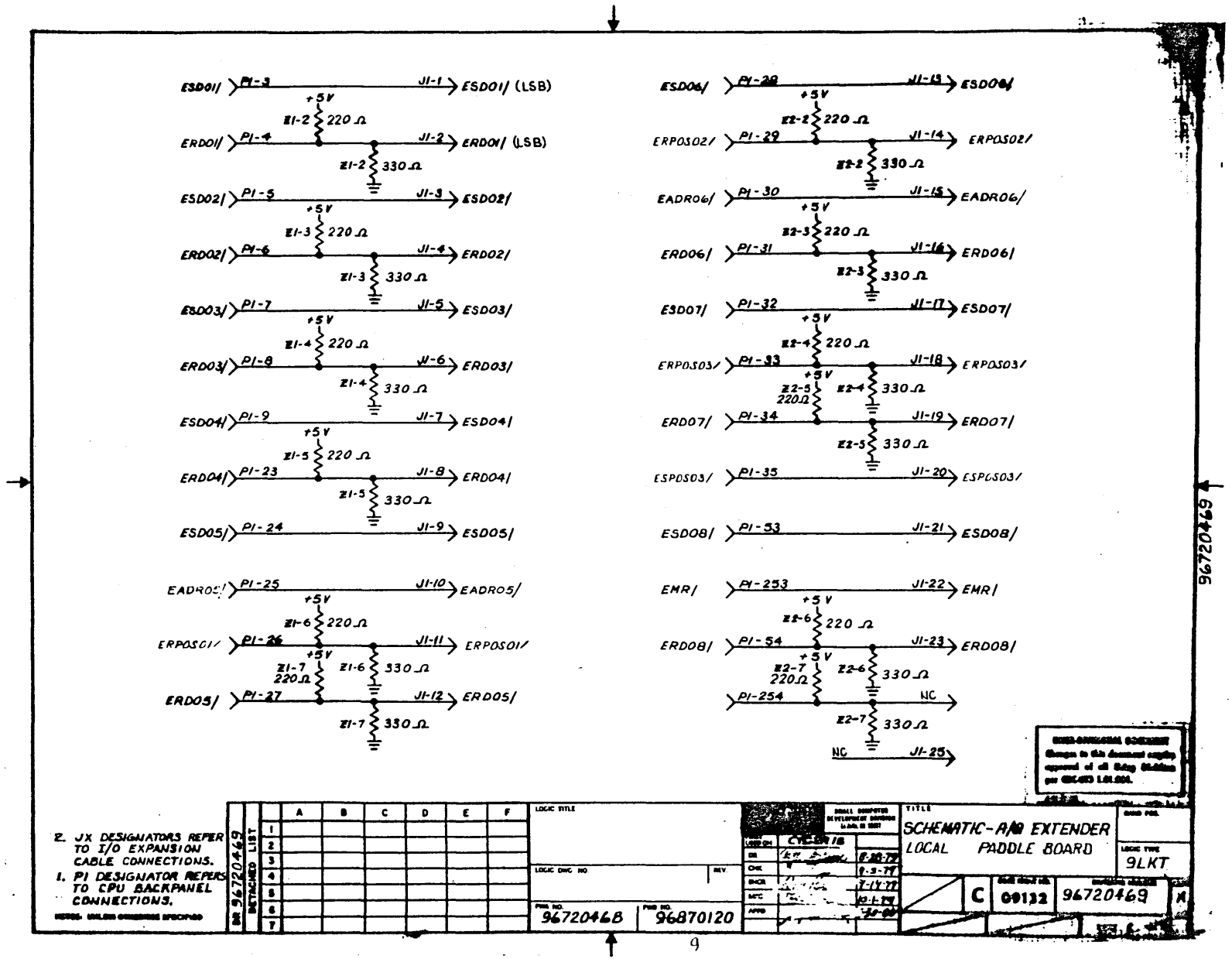


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 2 of 6)

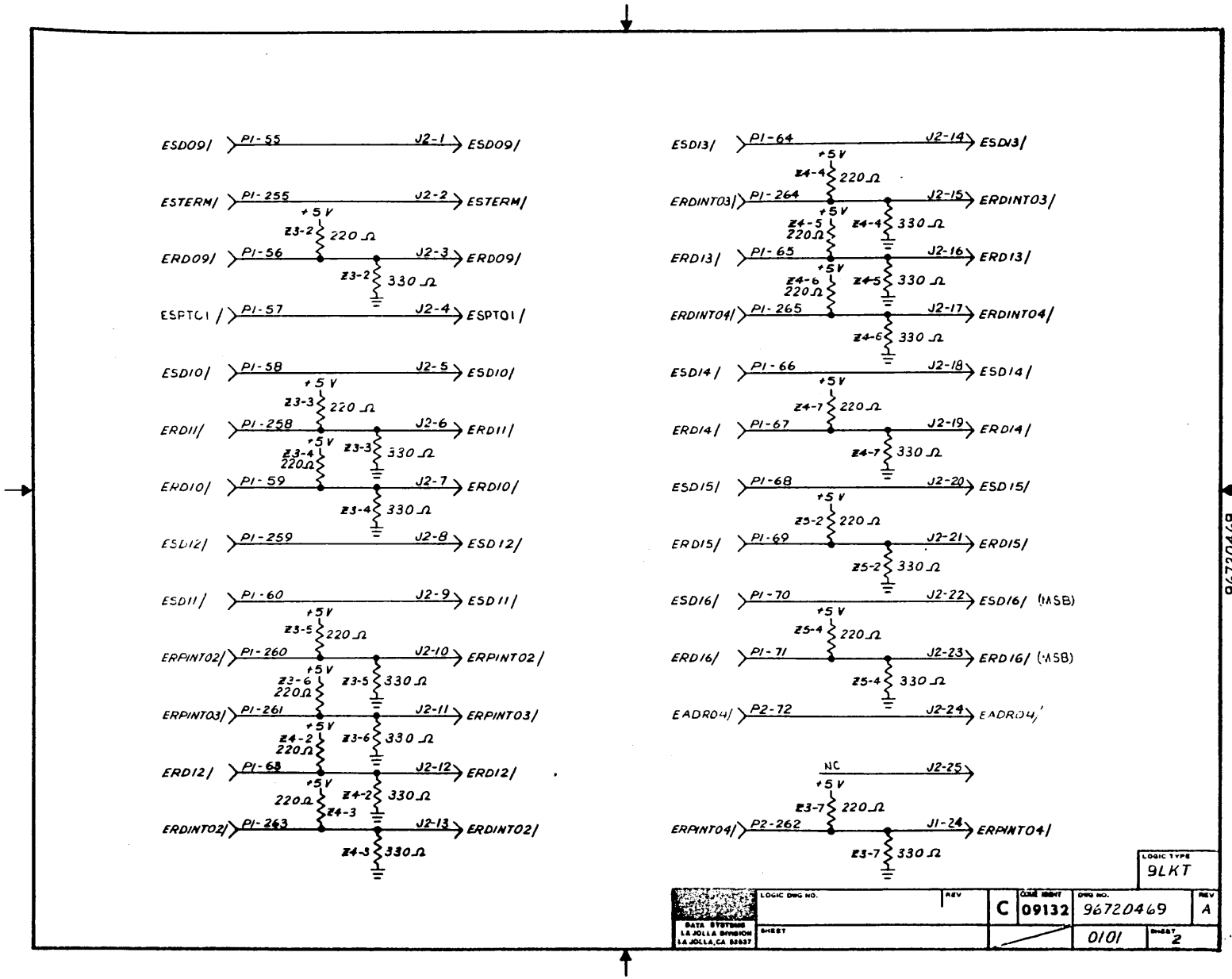


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 3 of 6)

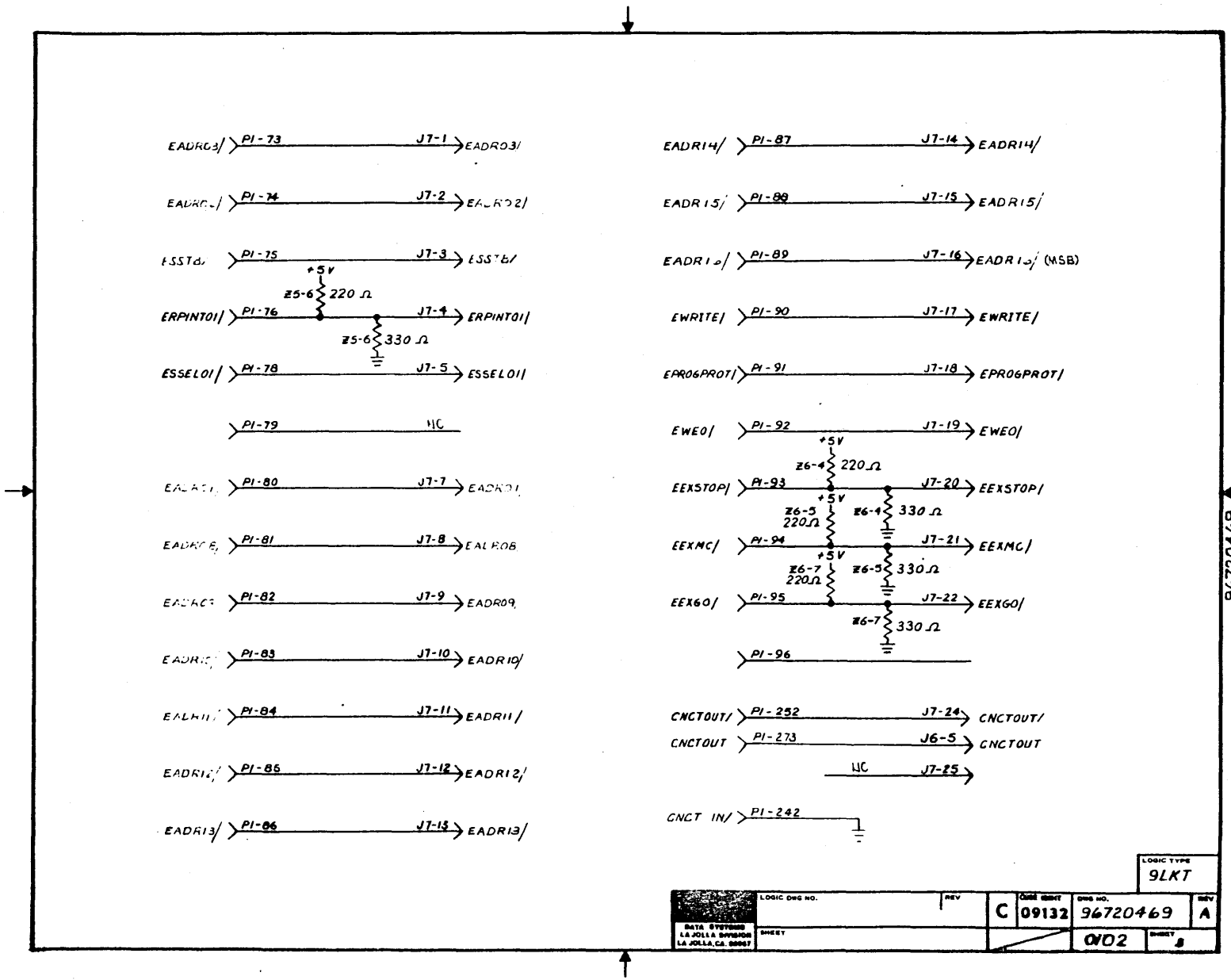


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 4 of 6)

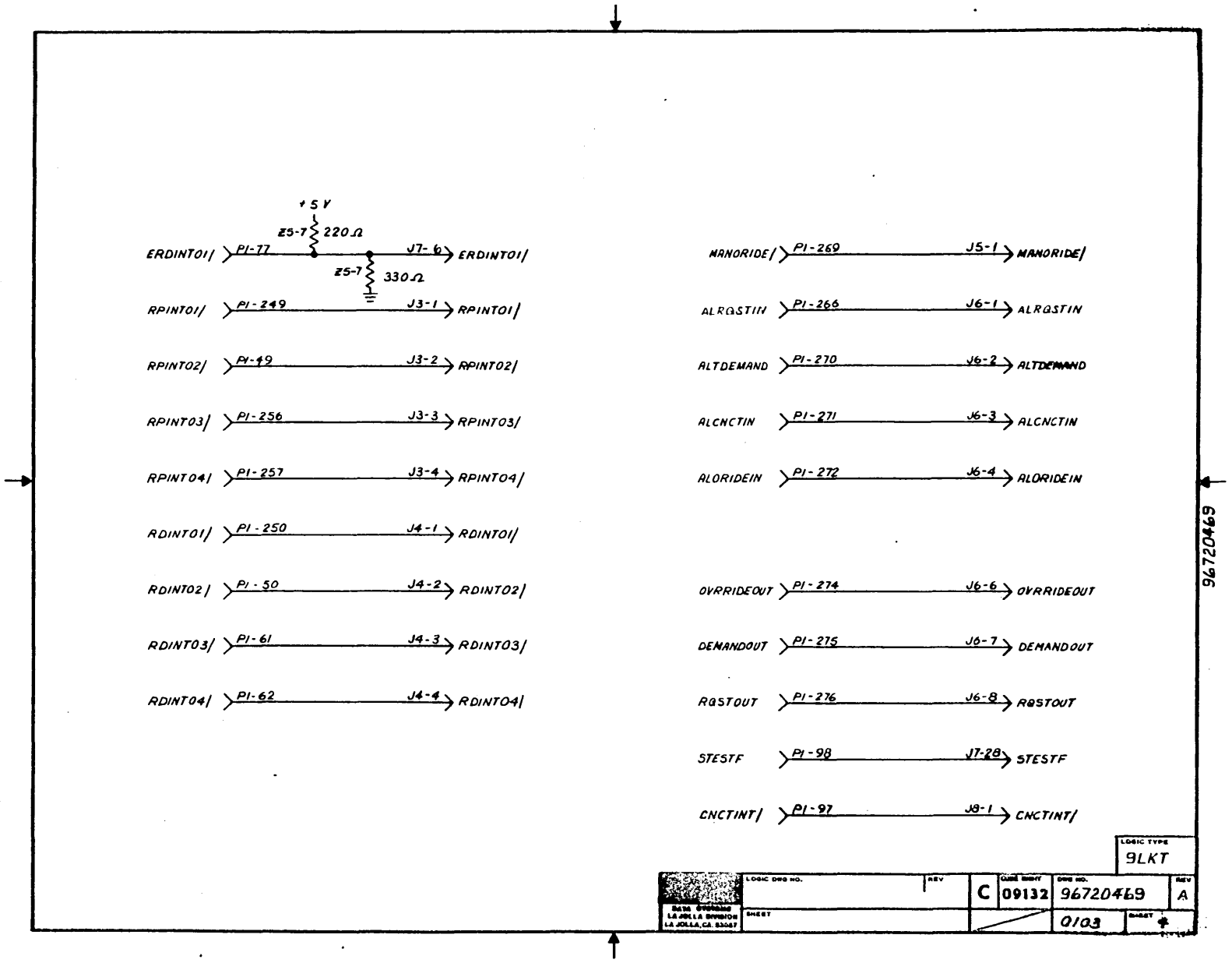


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 5 of 6)

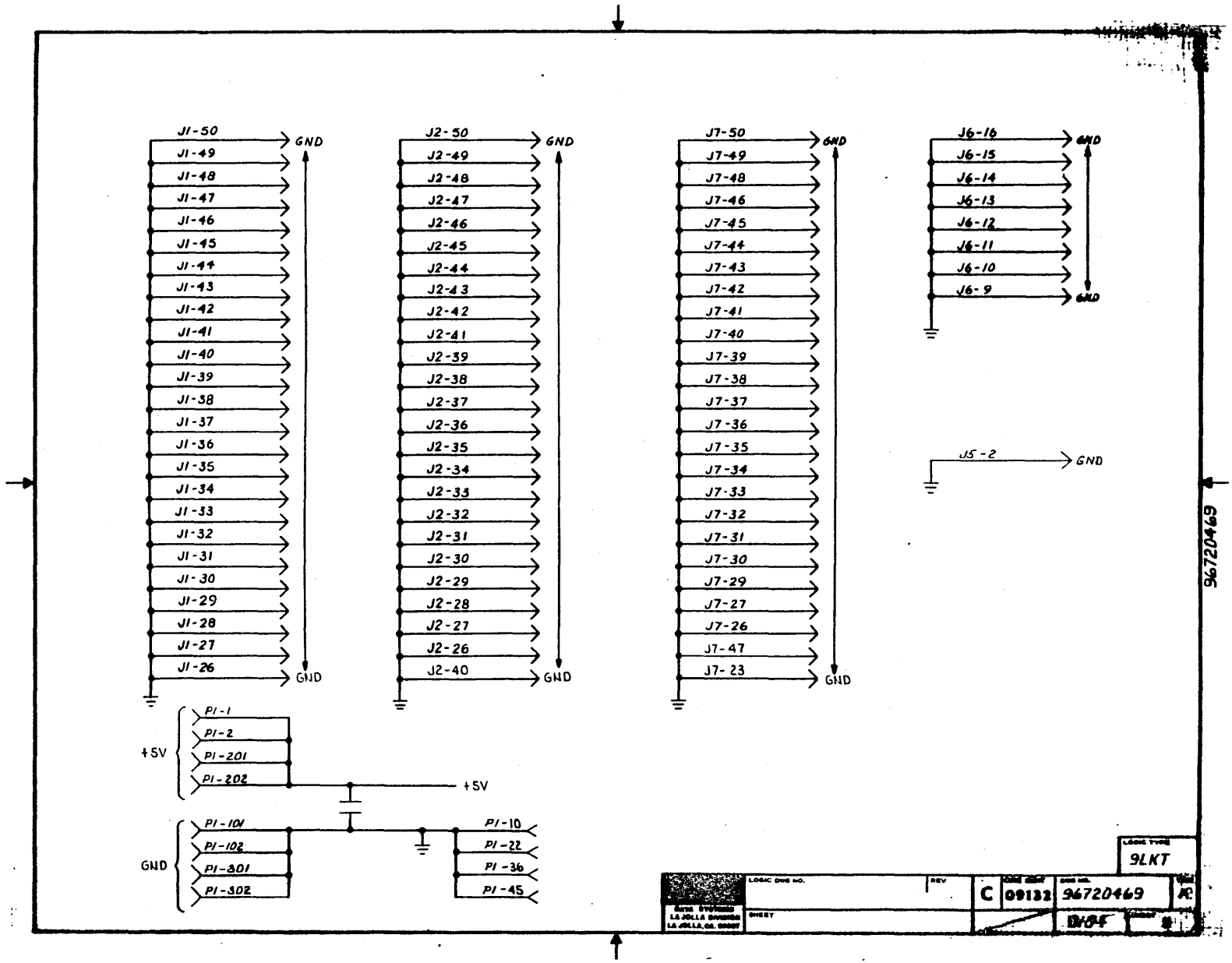


Figure 5-3. Local (AQX) Paddle Board Logic Diagram, 9LKT (Sheet 6 of 6)

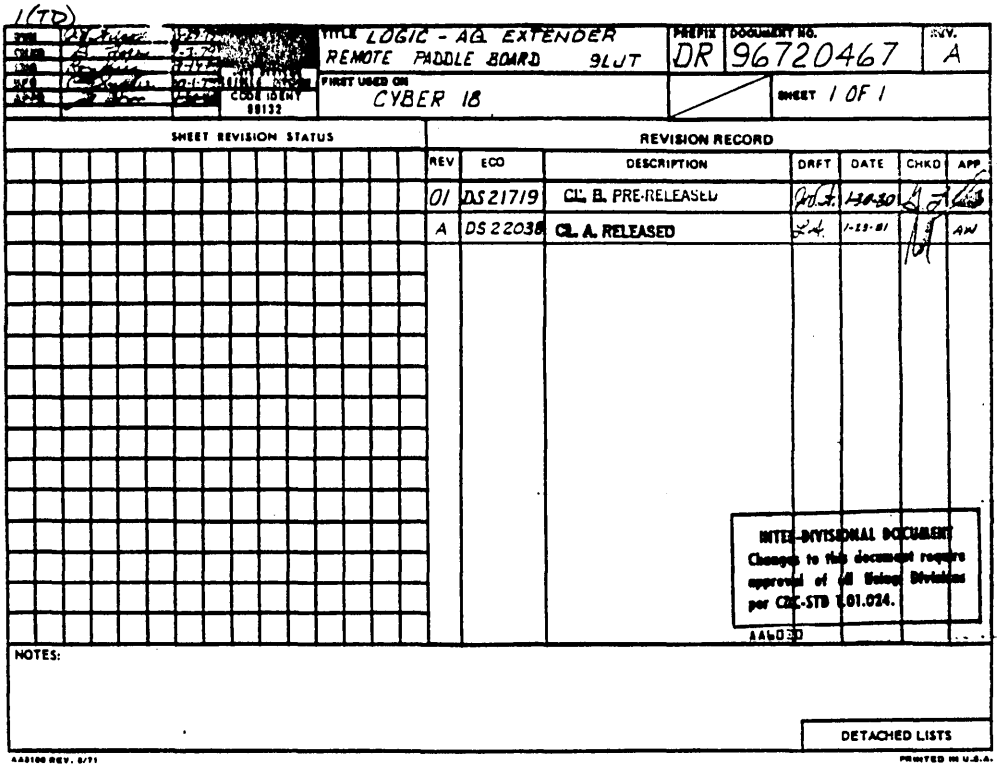


Figure 5-4. Remote (AQX) Paddle Board Logic Diagram, 9LJT (Sheet 1 of 5)

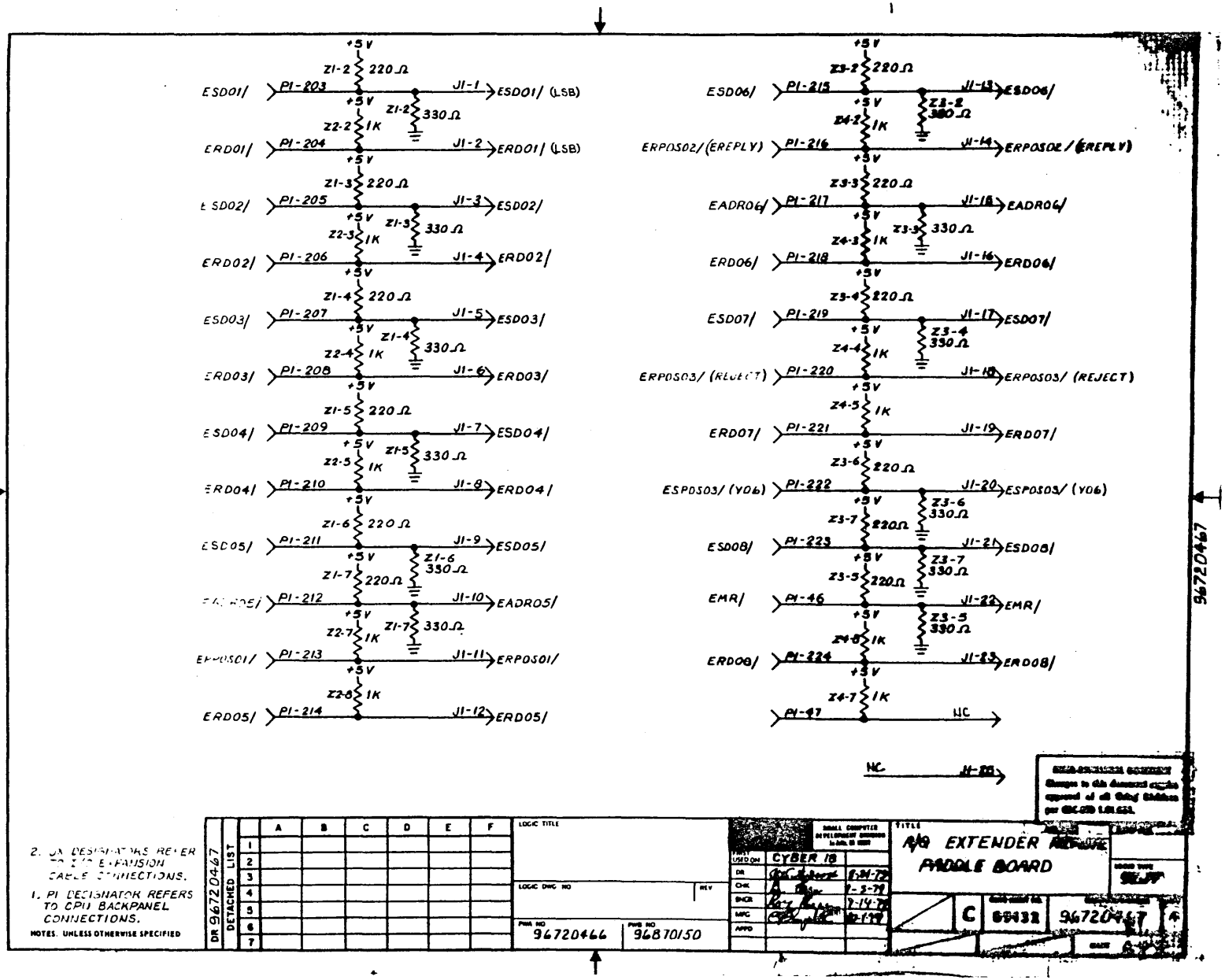


Figure 5-4. Remote (AQX) Paddle Board Logic Diagram, 9LJT (Sheet 2 of 5)

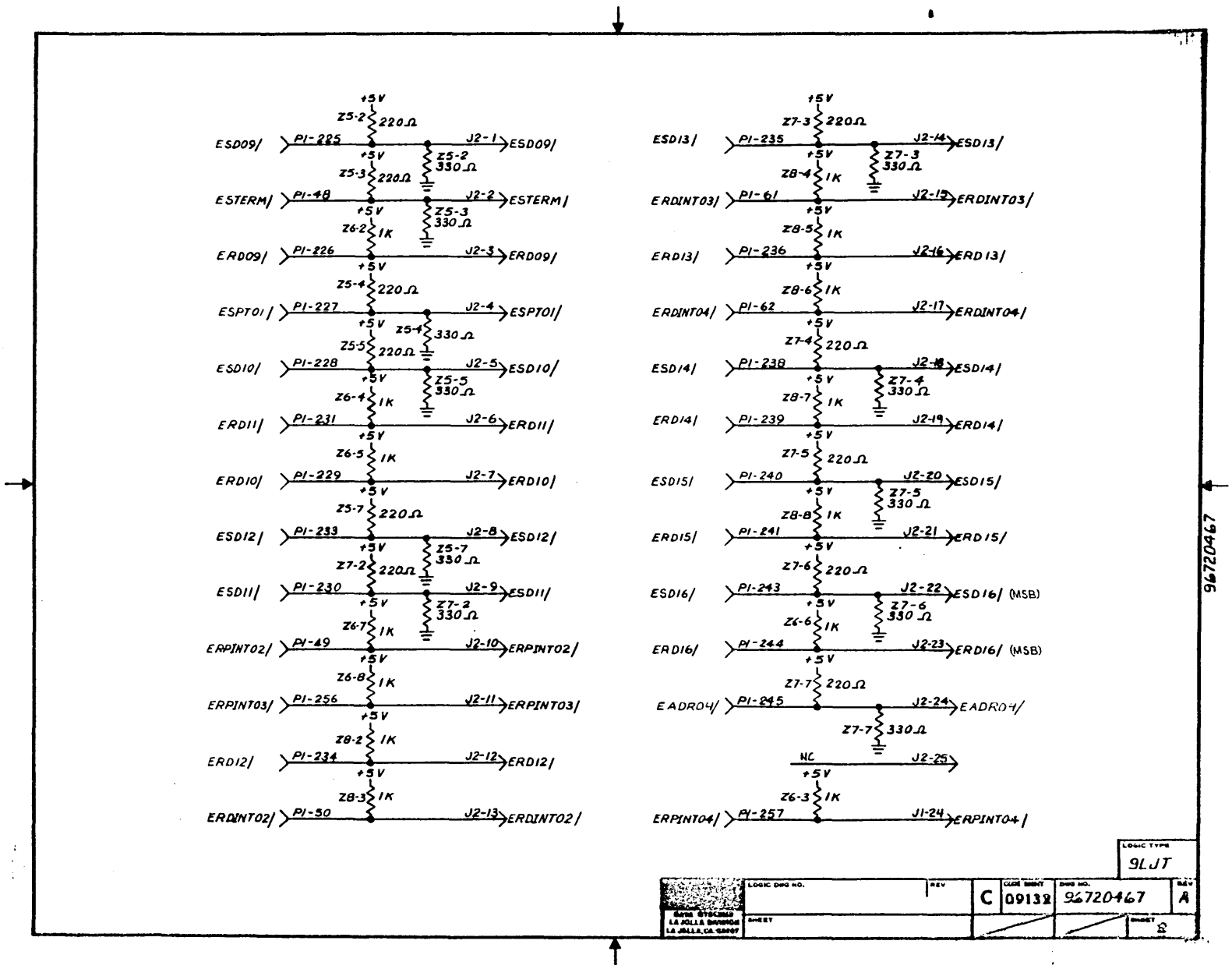


Figure 5-4. Remote (AQX) Paddle Board Logic Diagram, 9LJT (Sheet 3 of 5)

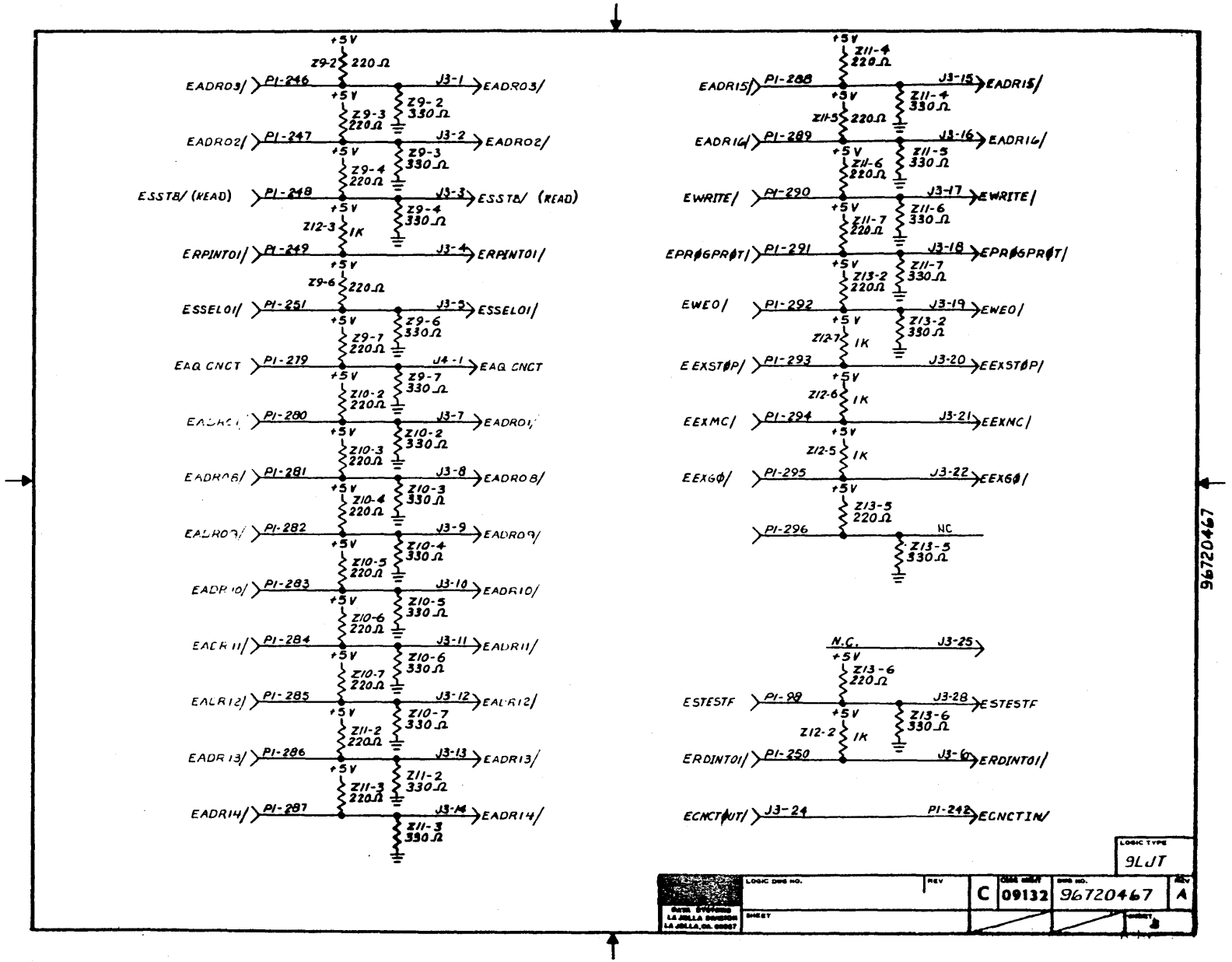


Figure 5-4. Remote (AQX) Paddle Board Logic Diagram, 9LJT (Sheet 4 of 5)

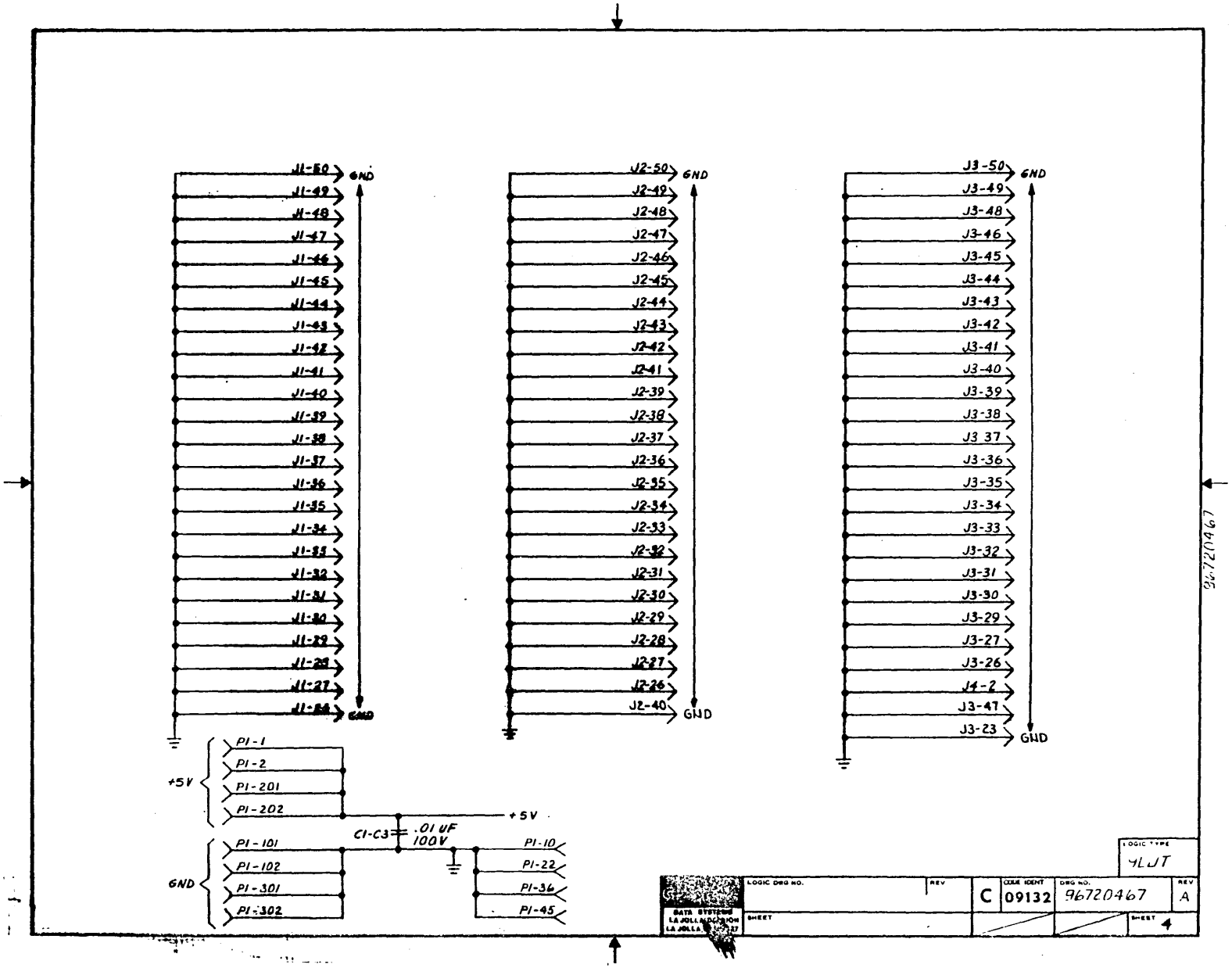


Figure 5-4. Remote (AQX) Paddle Board Logic Diagram, 9LJT (Sheet 5 of 5)

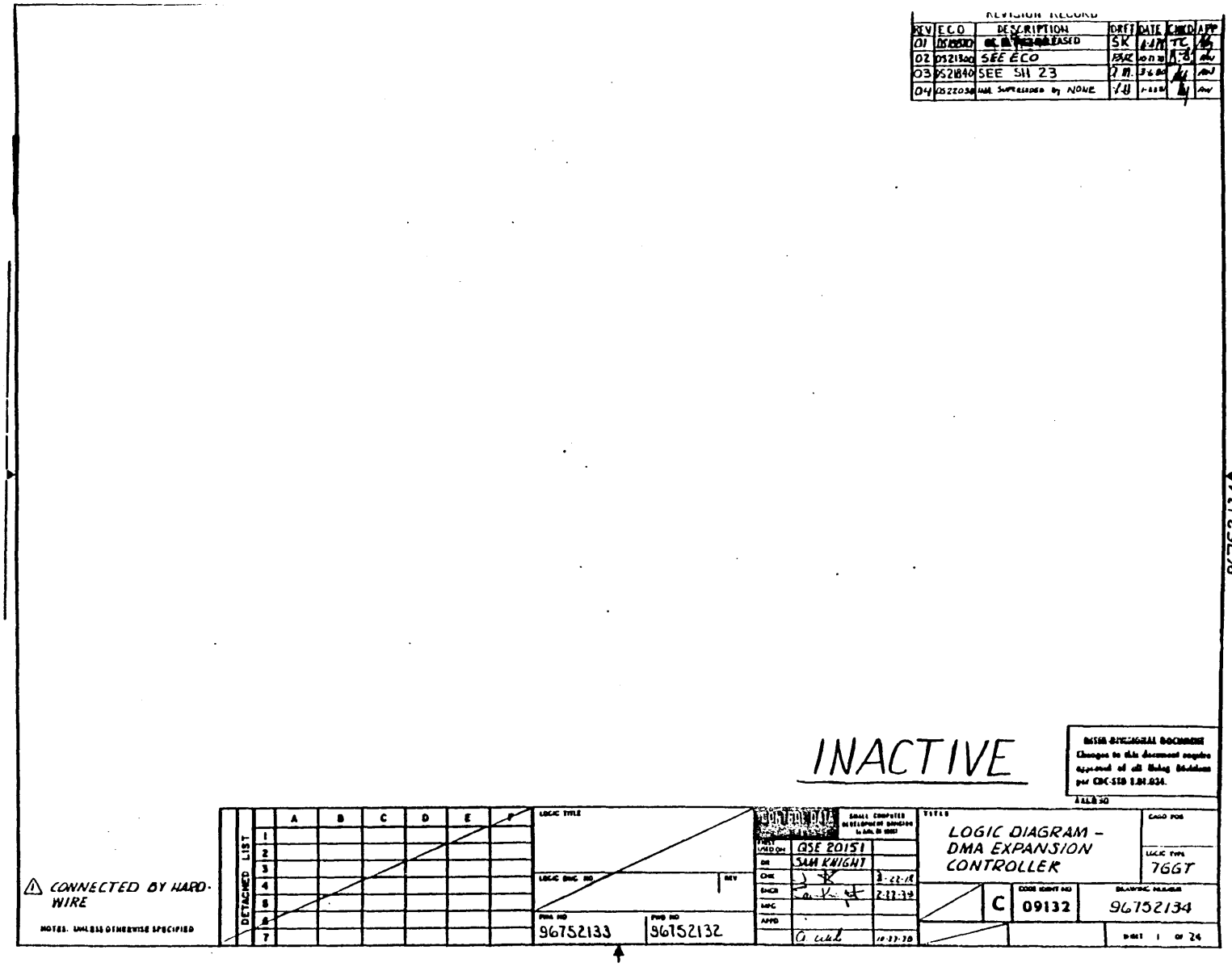


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 1 of 24)

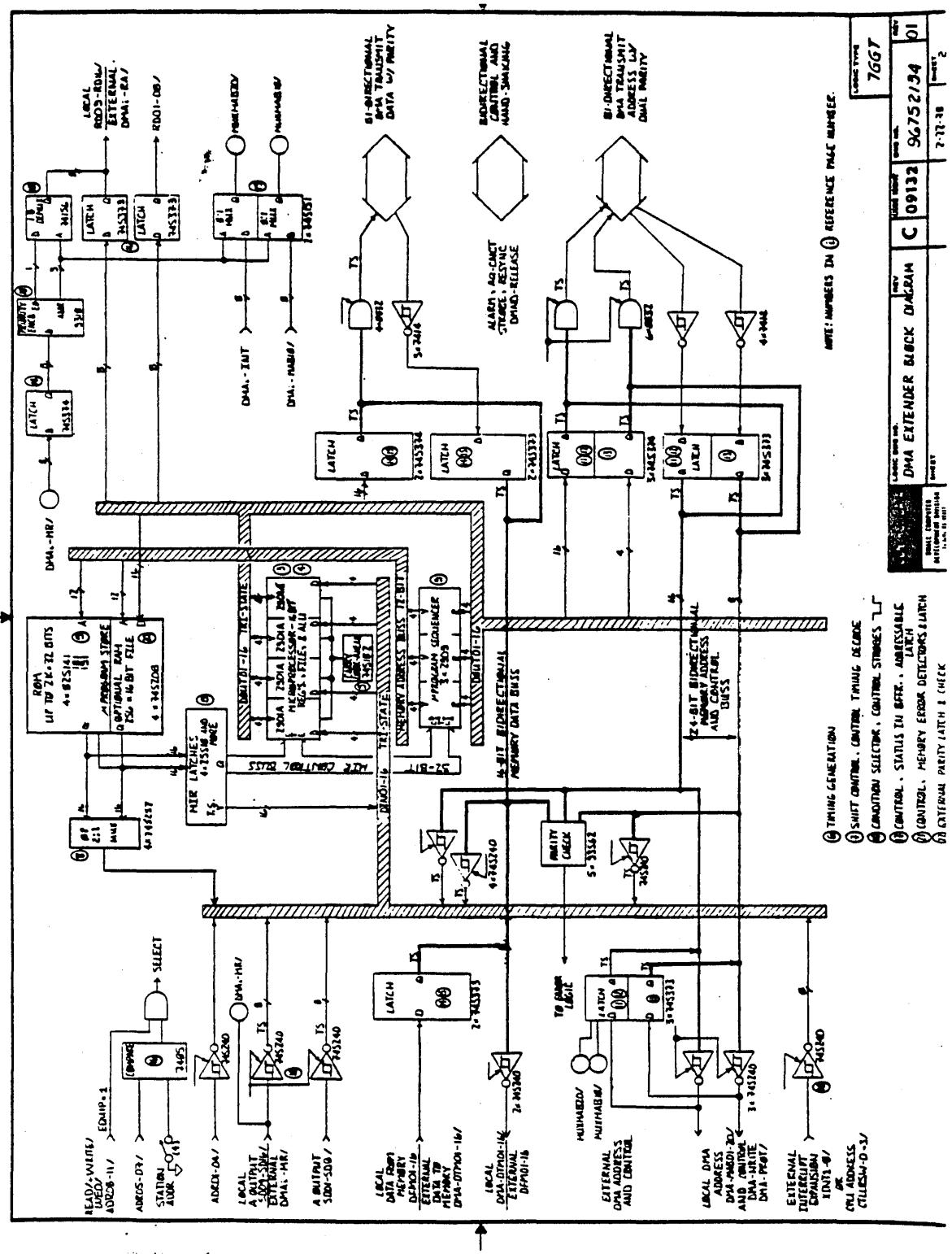


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 2 of 24)

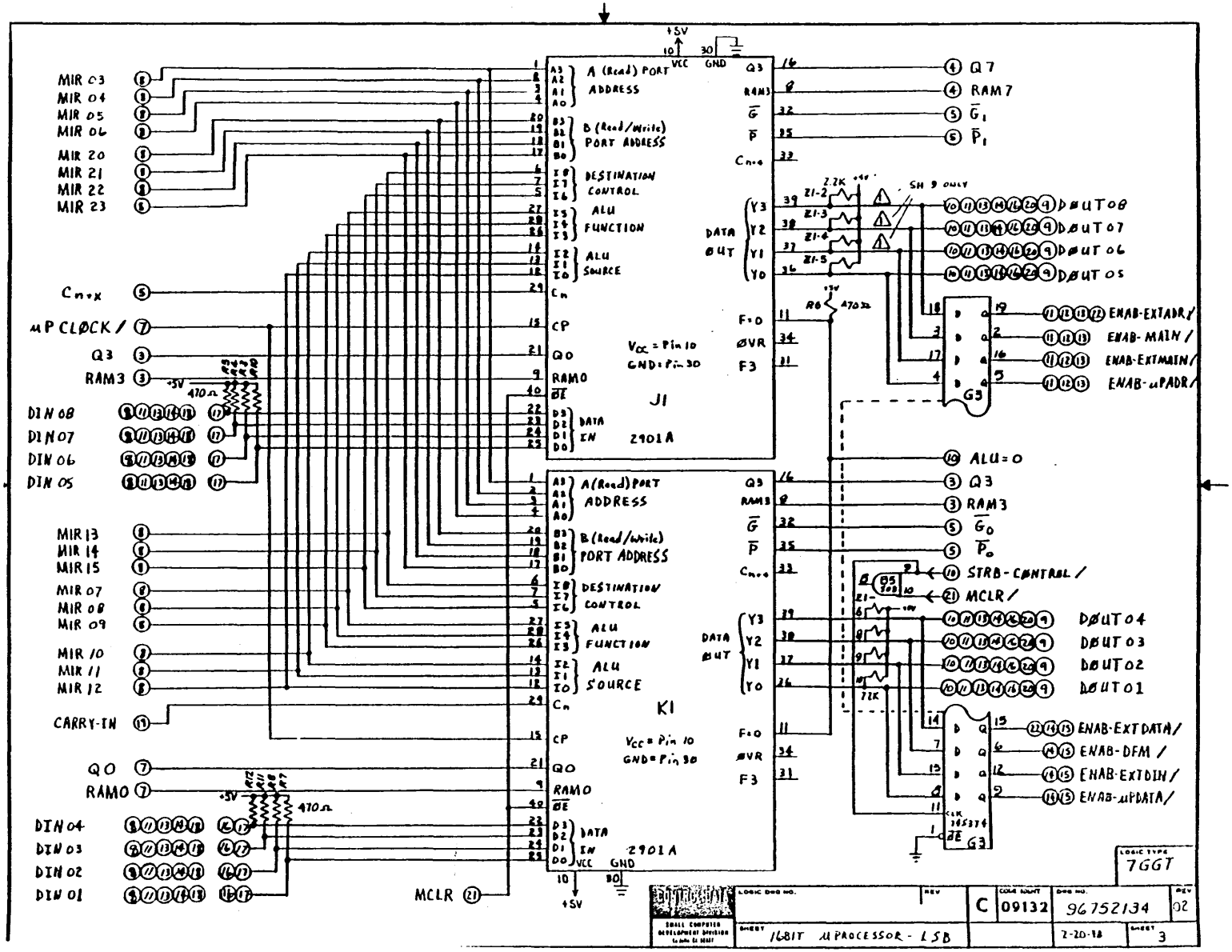


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 3 of 24)

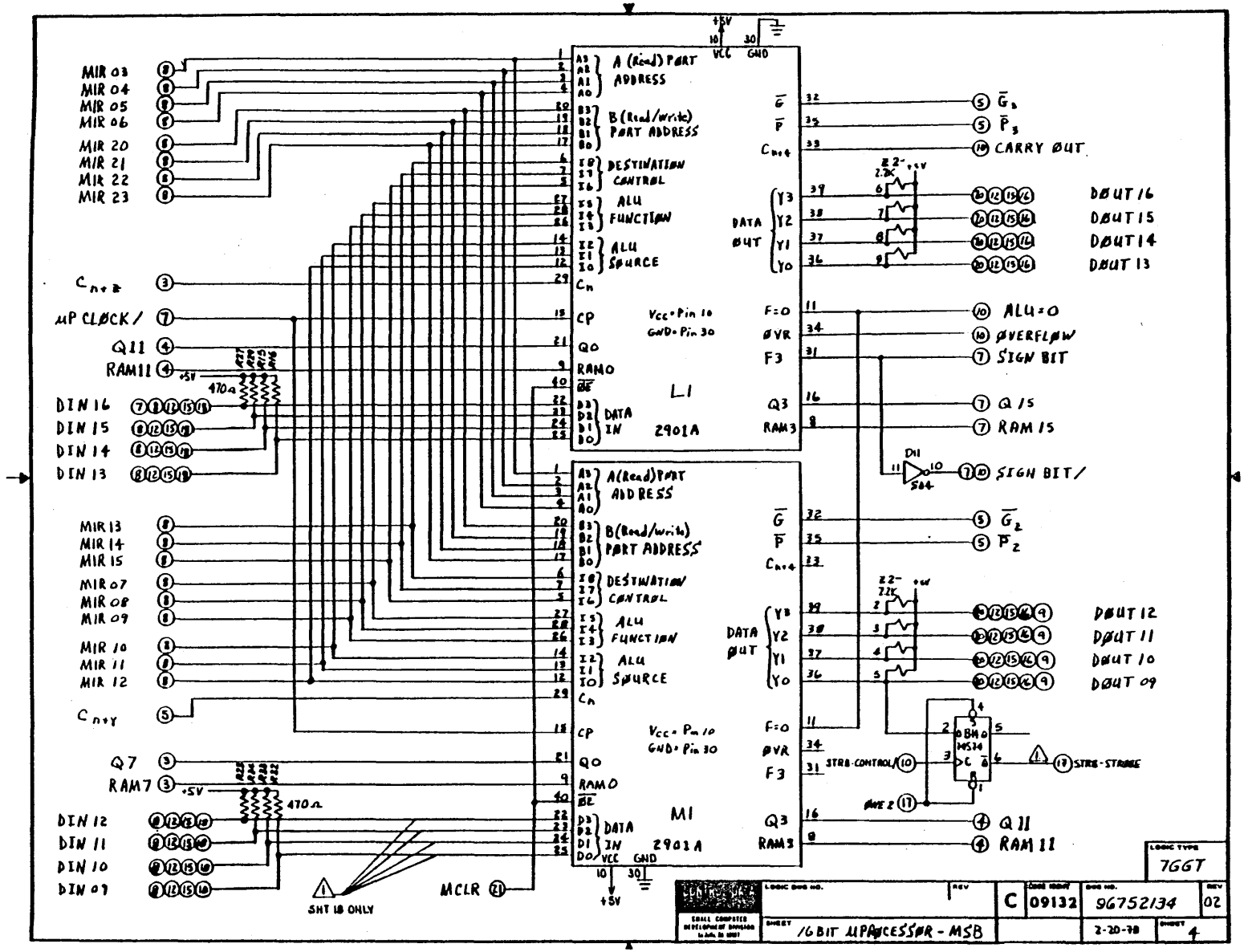


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 4 of 24)

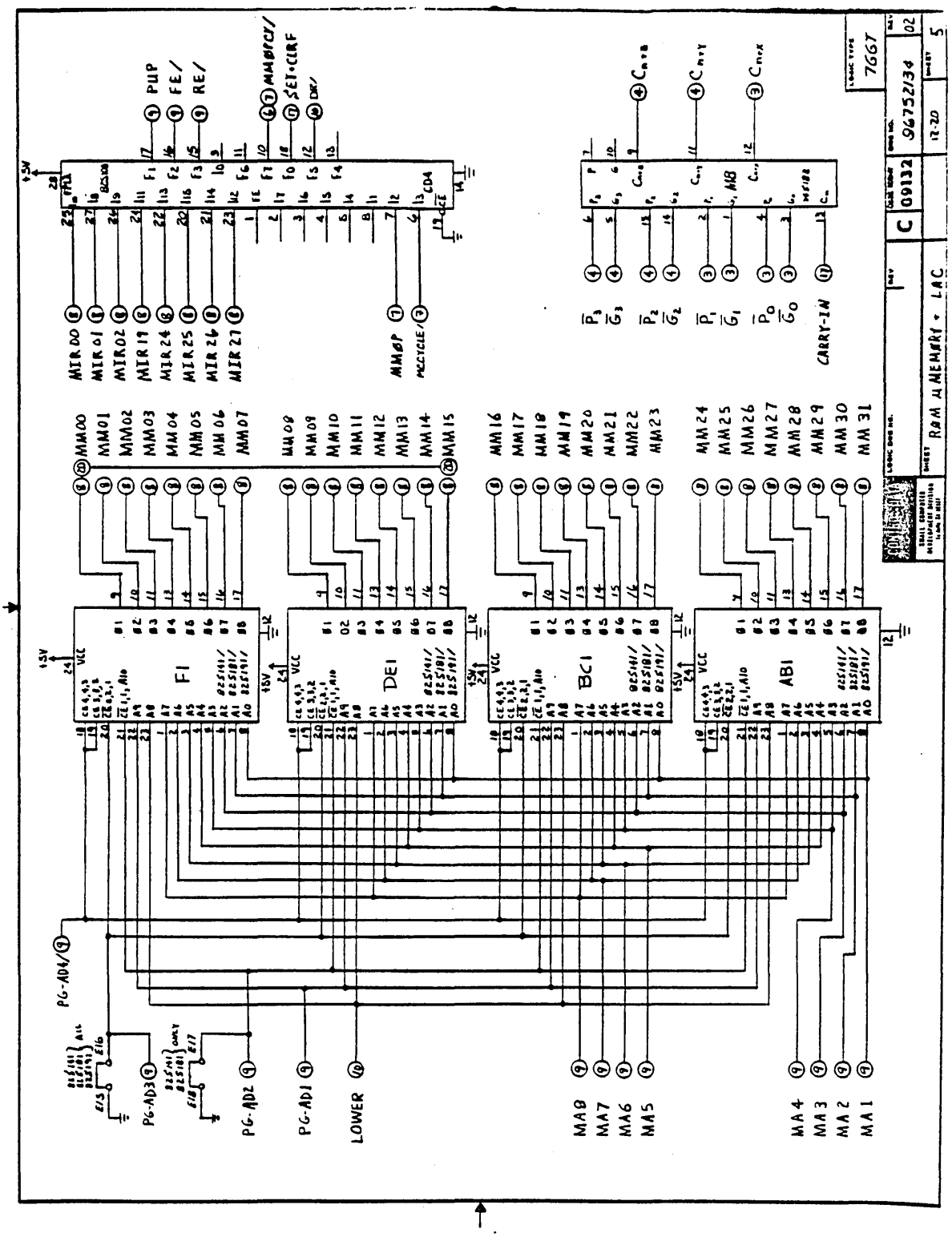


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 5 of 24)

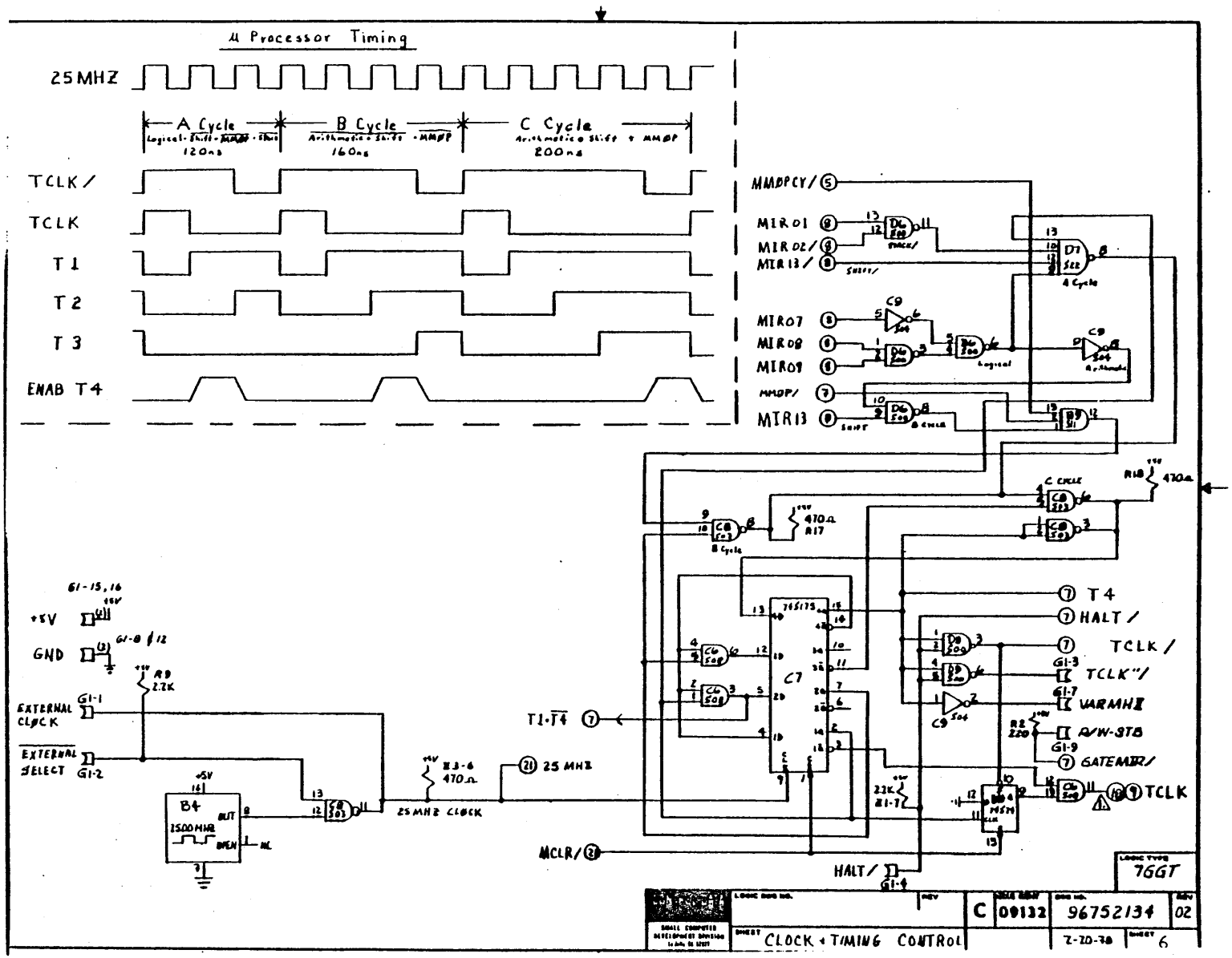


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 6 of 24)

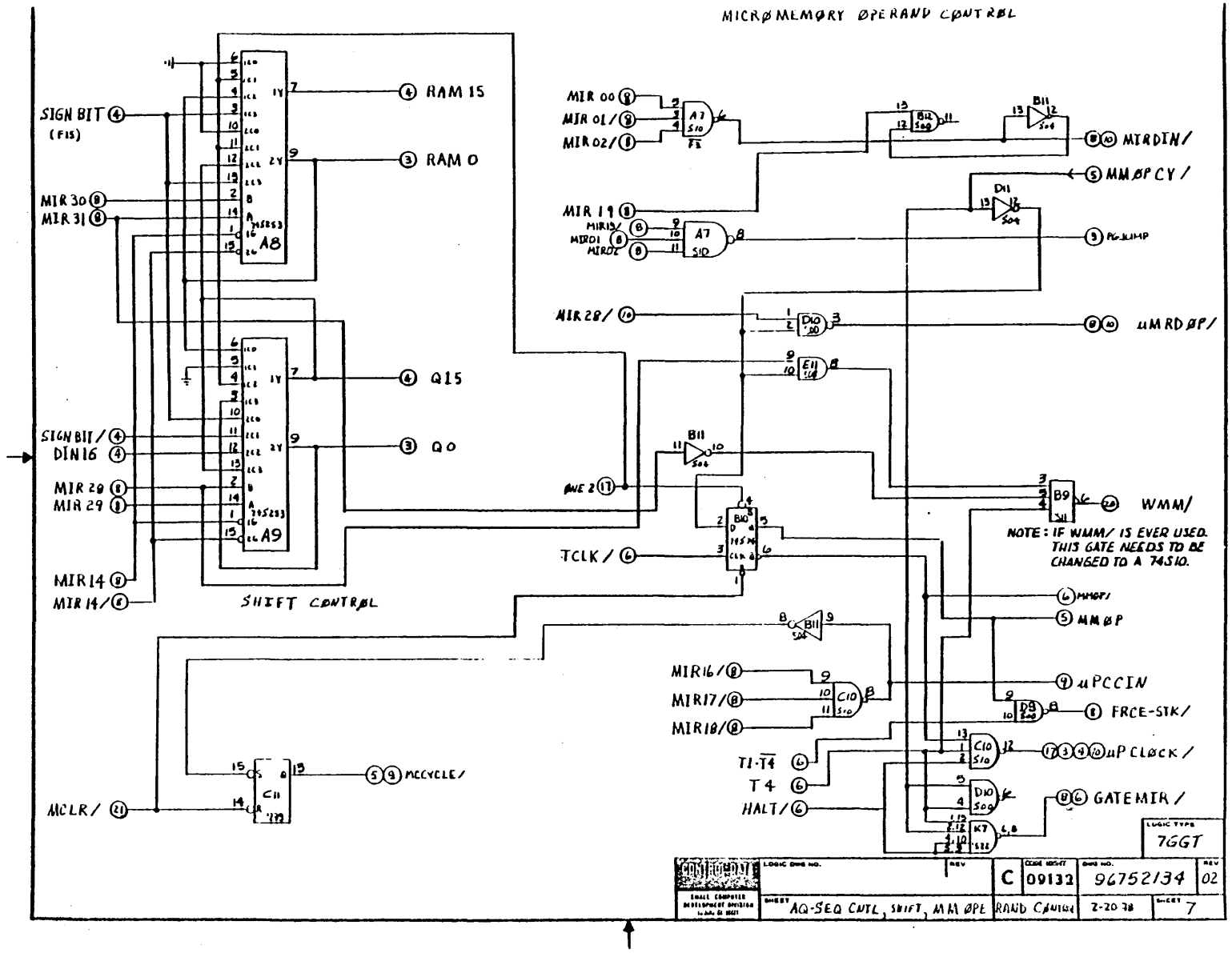


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 7 of 24)

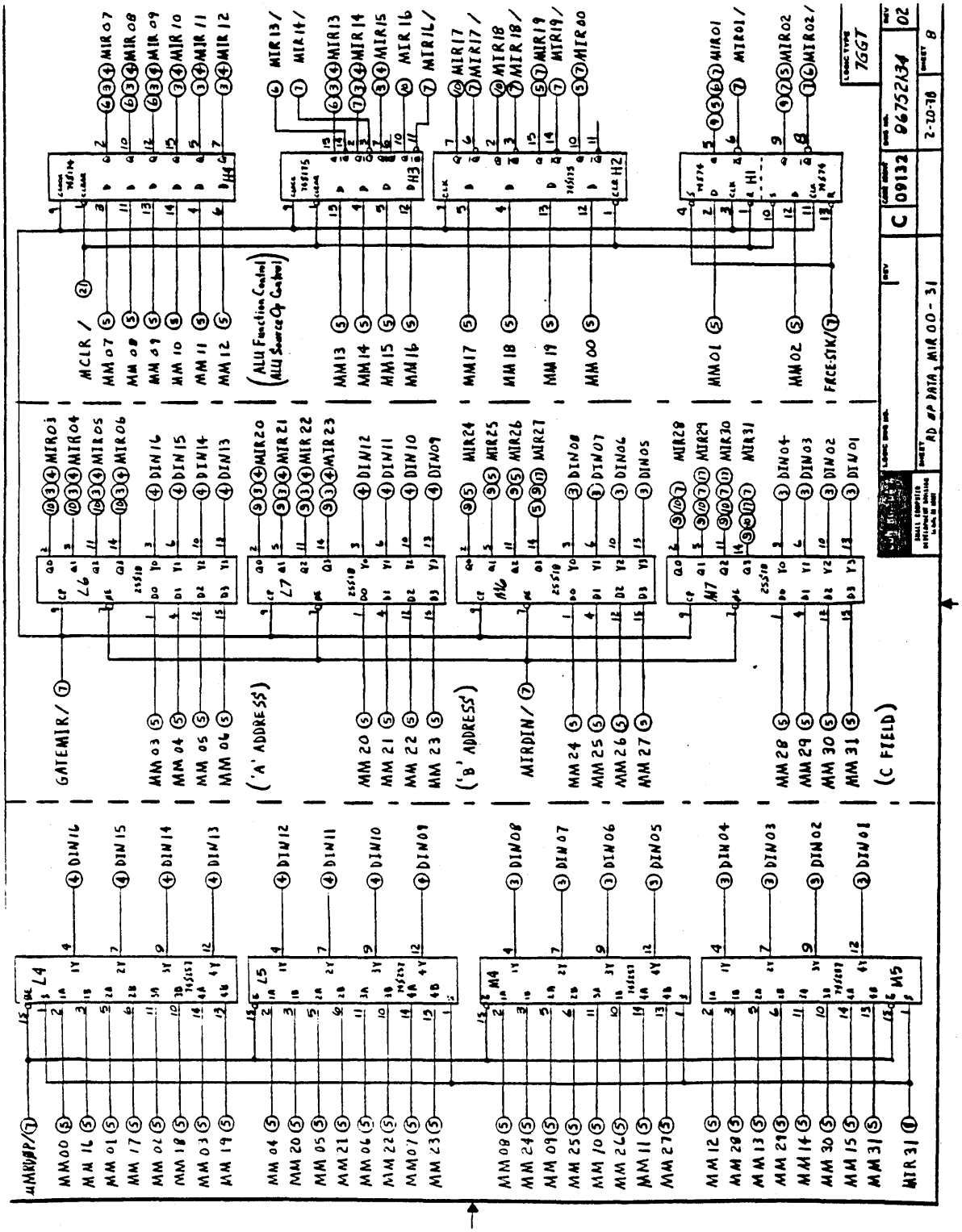


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 8 of 24)

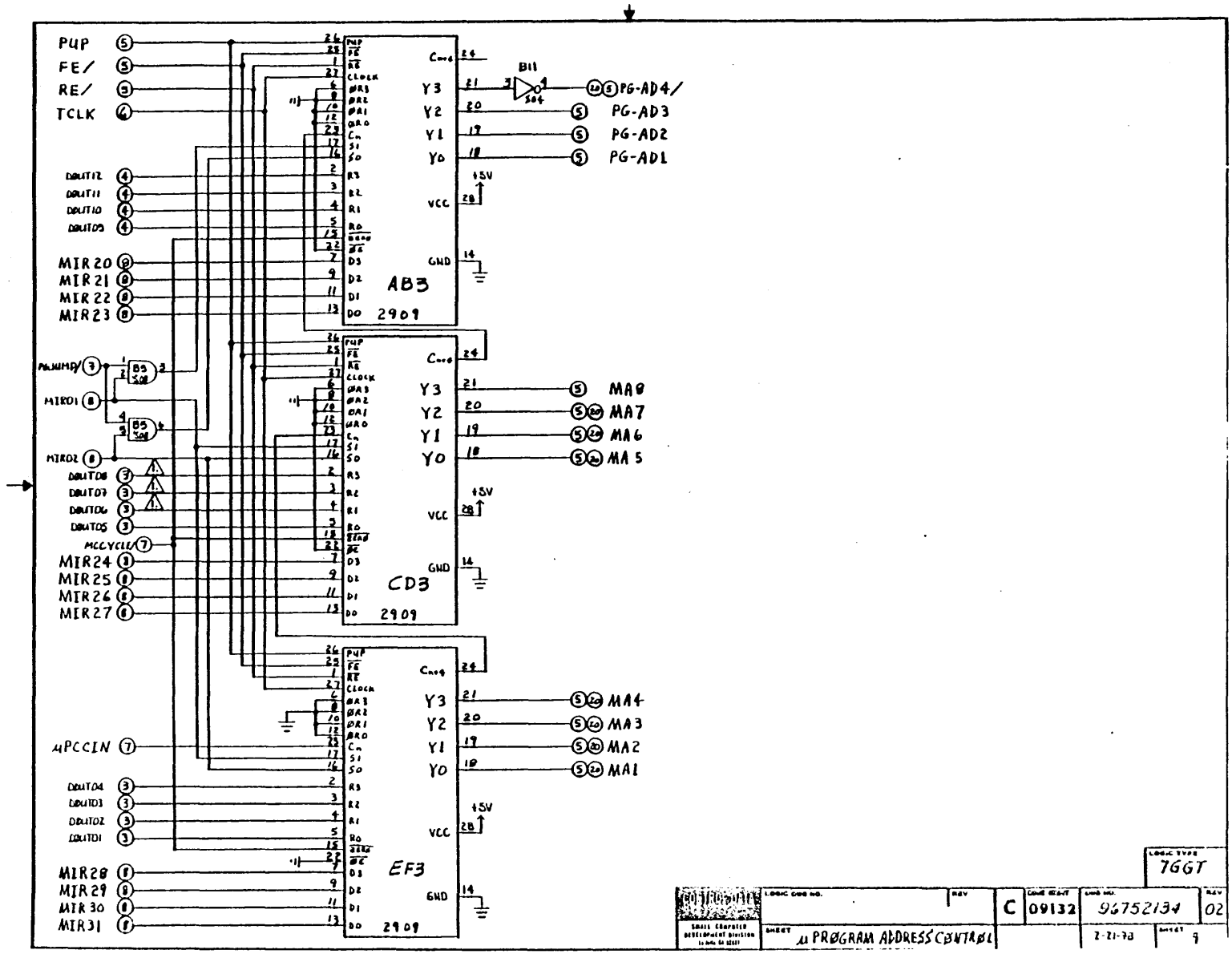


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 9 of 24)

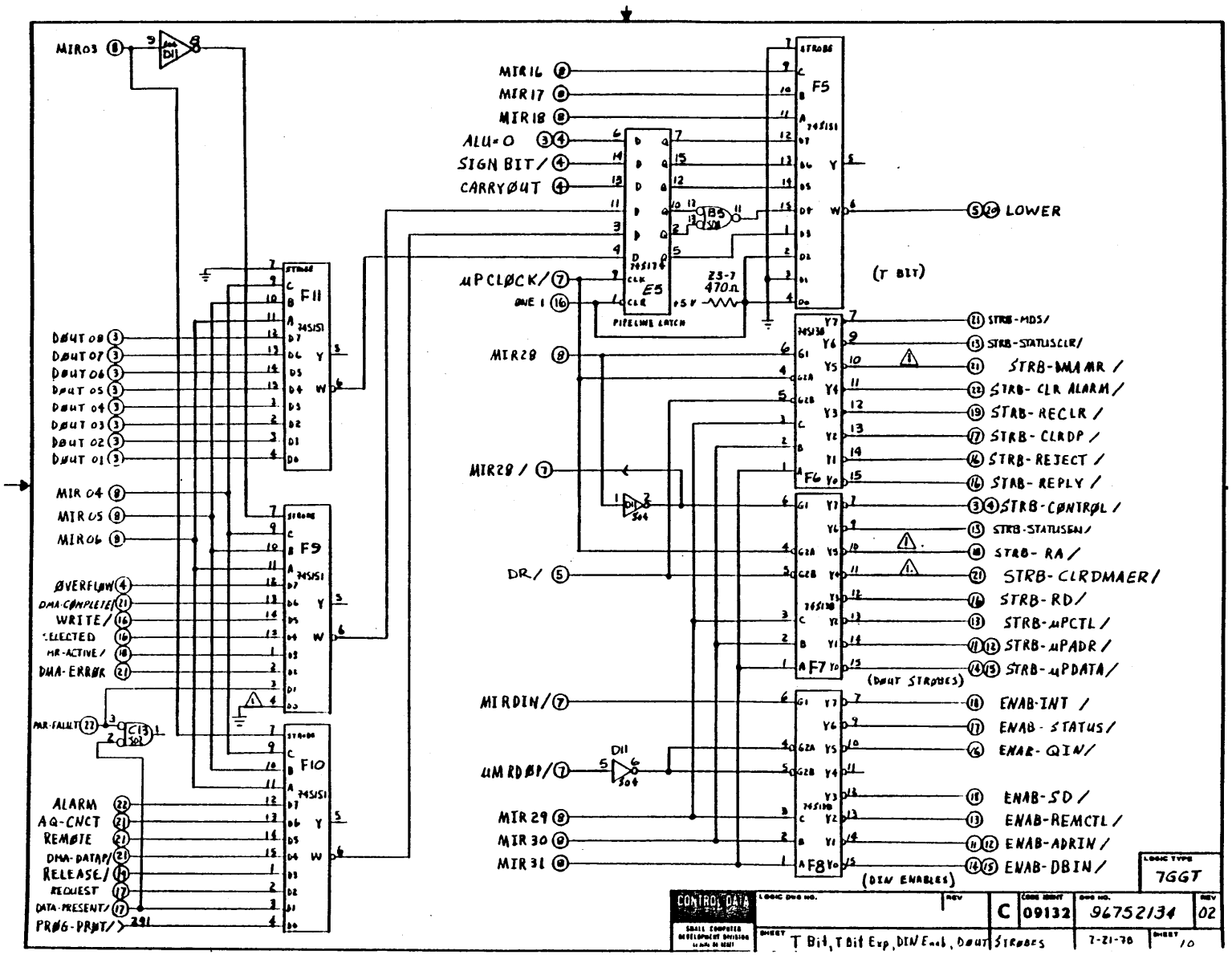


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 10 of 24)

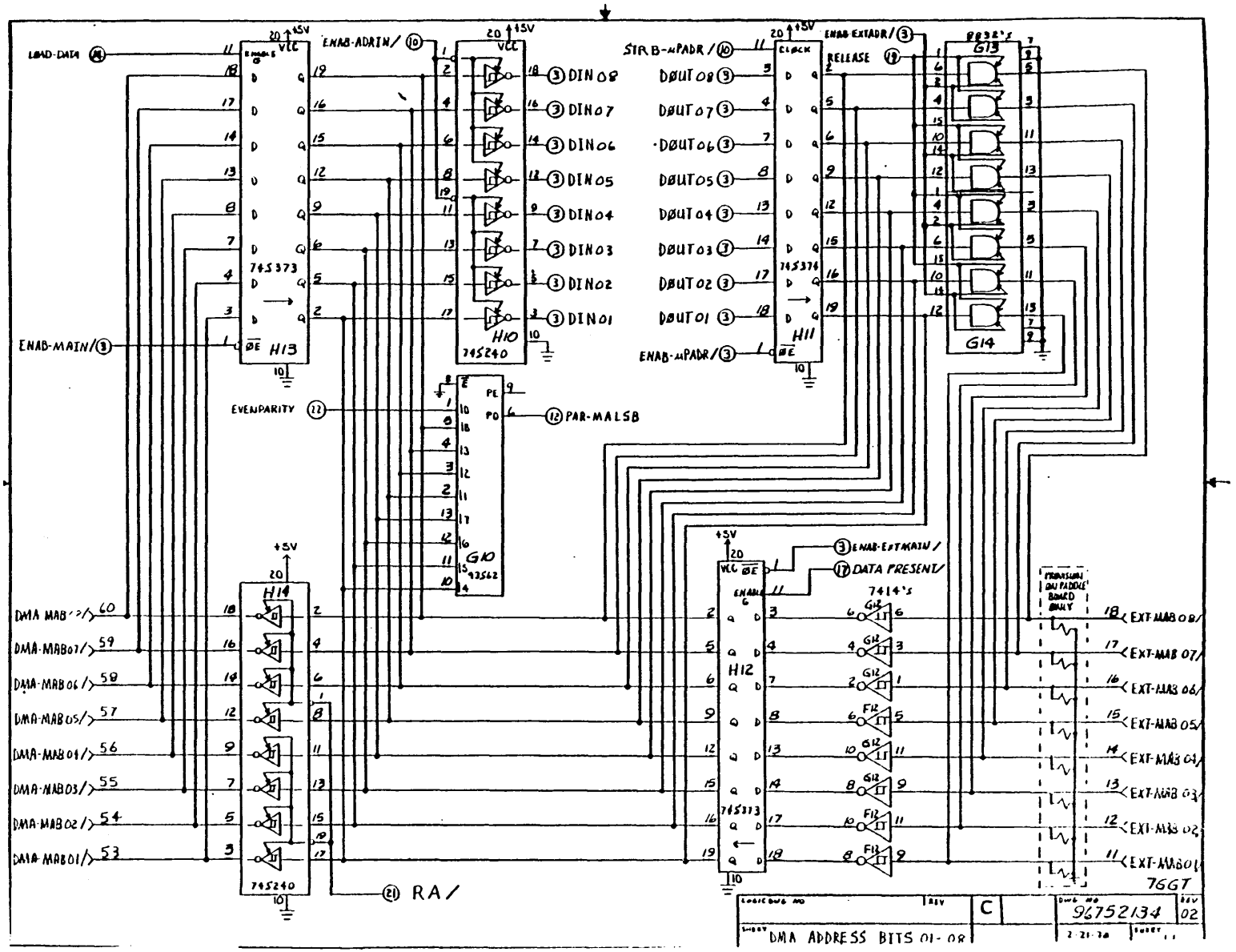


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 11 of 24)

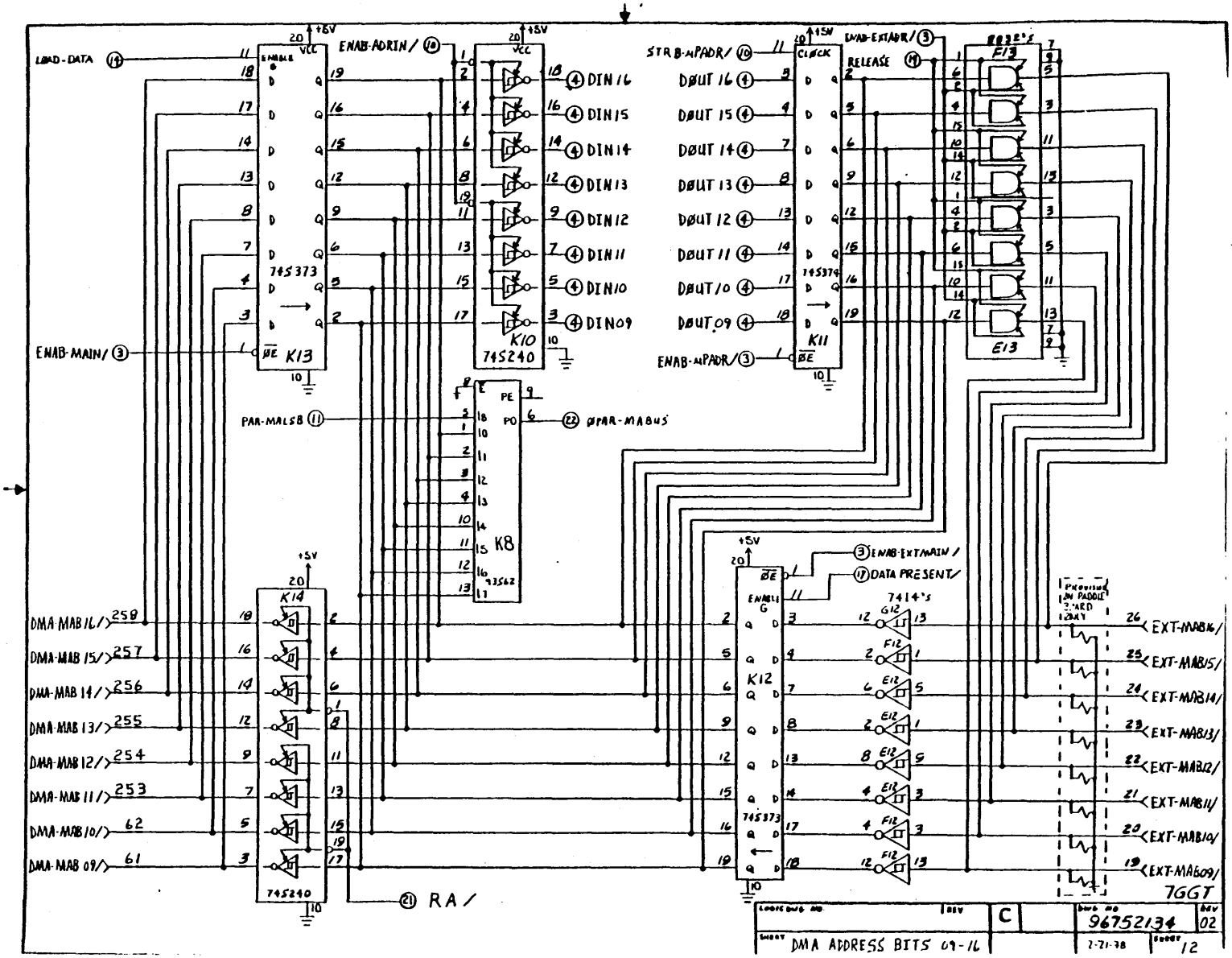


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 12 of 24)

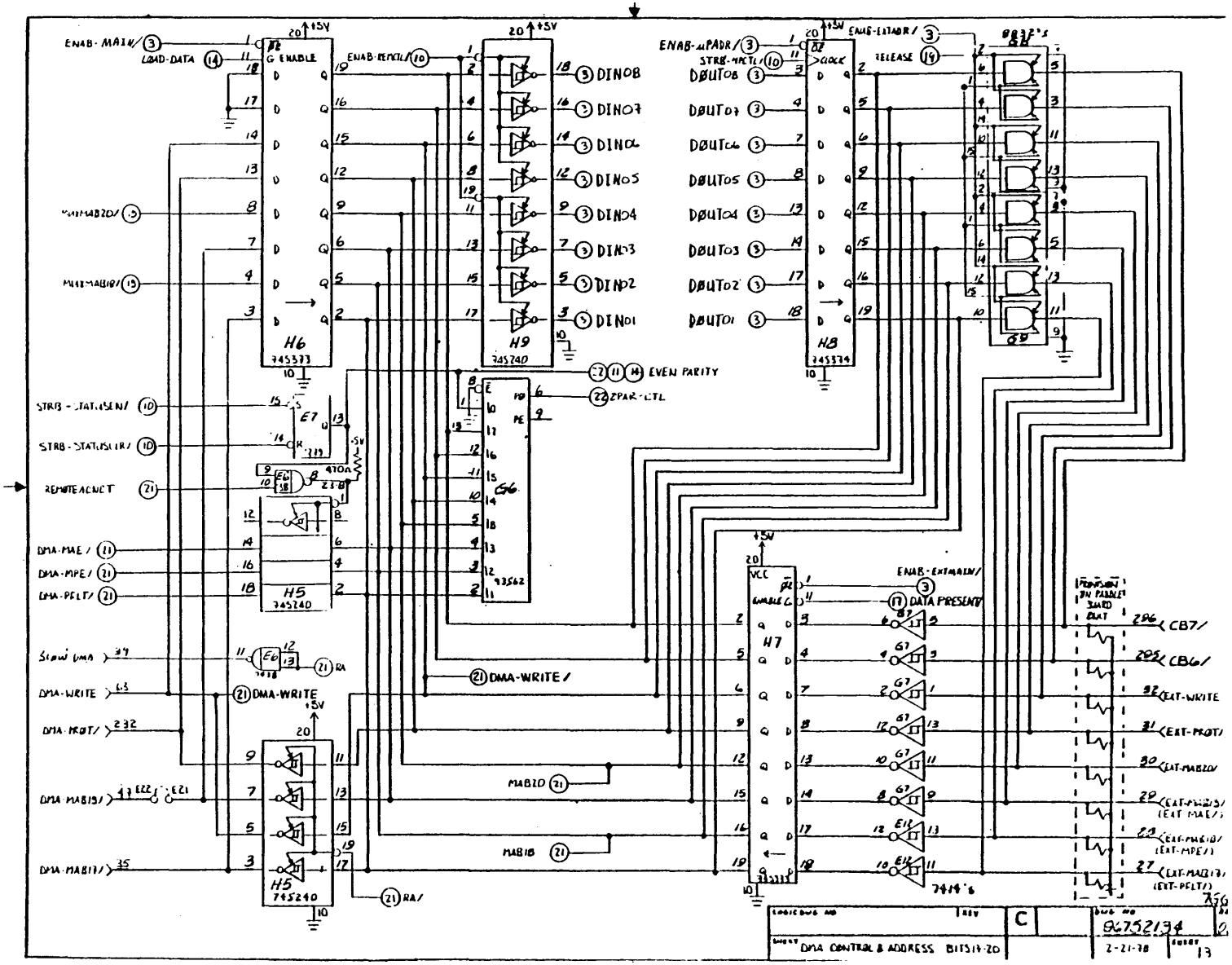


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 13 of 24)

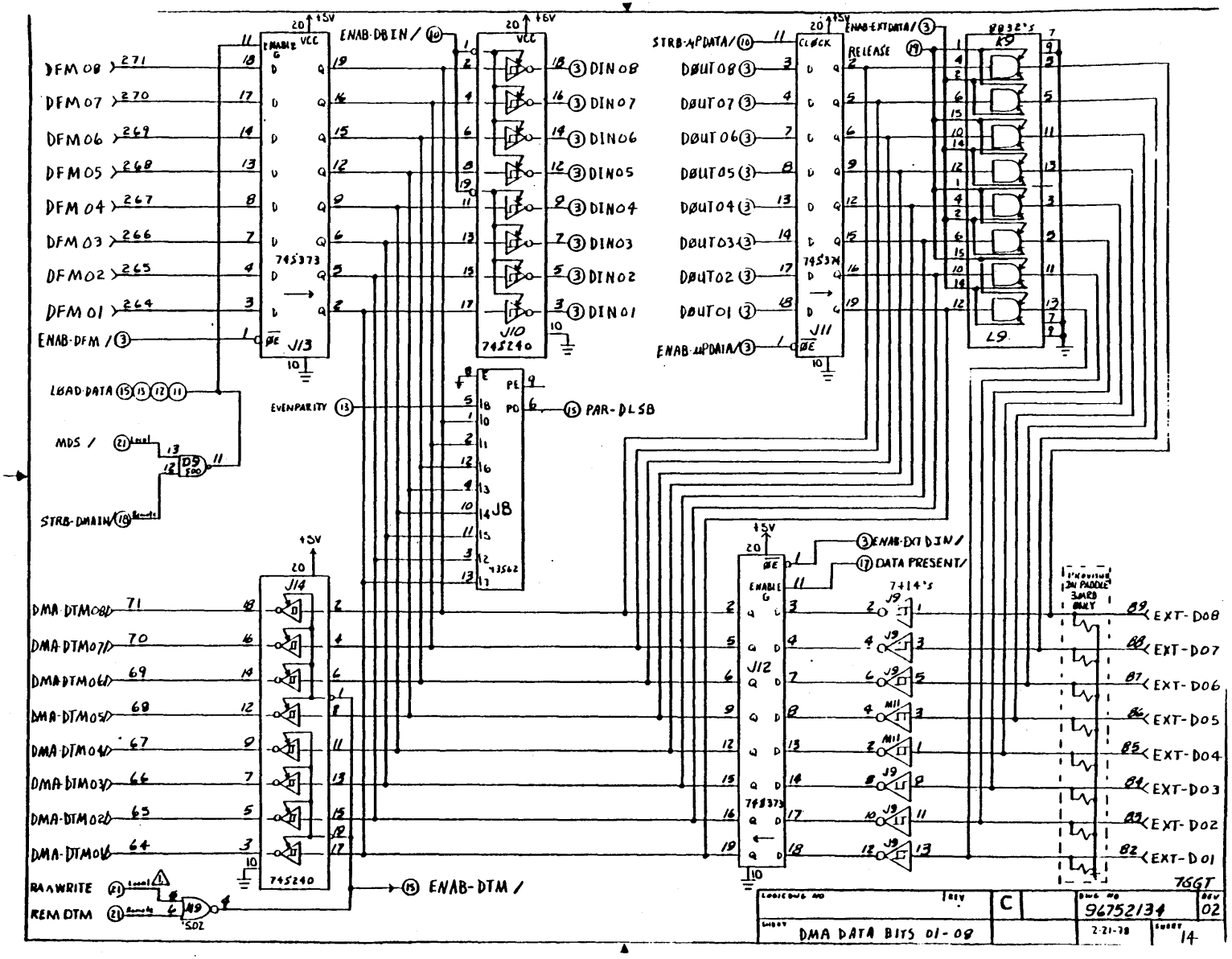


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 14 of 24)

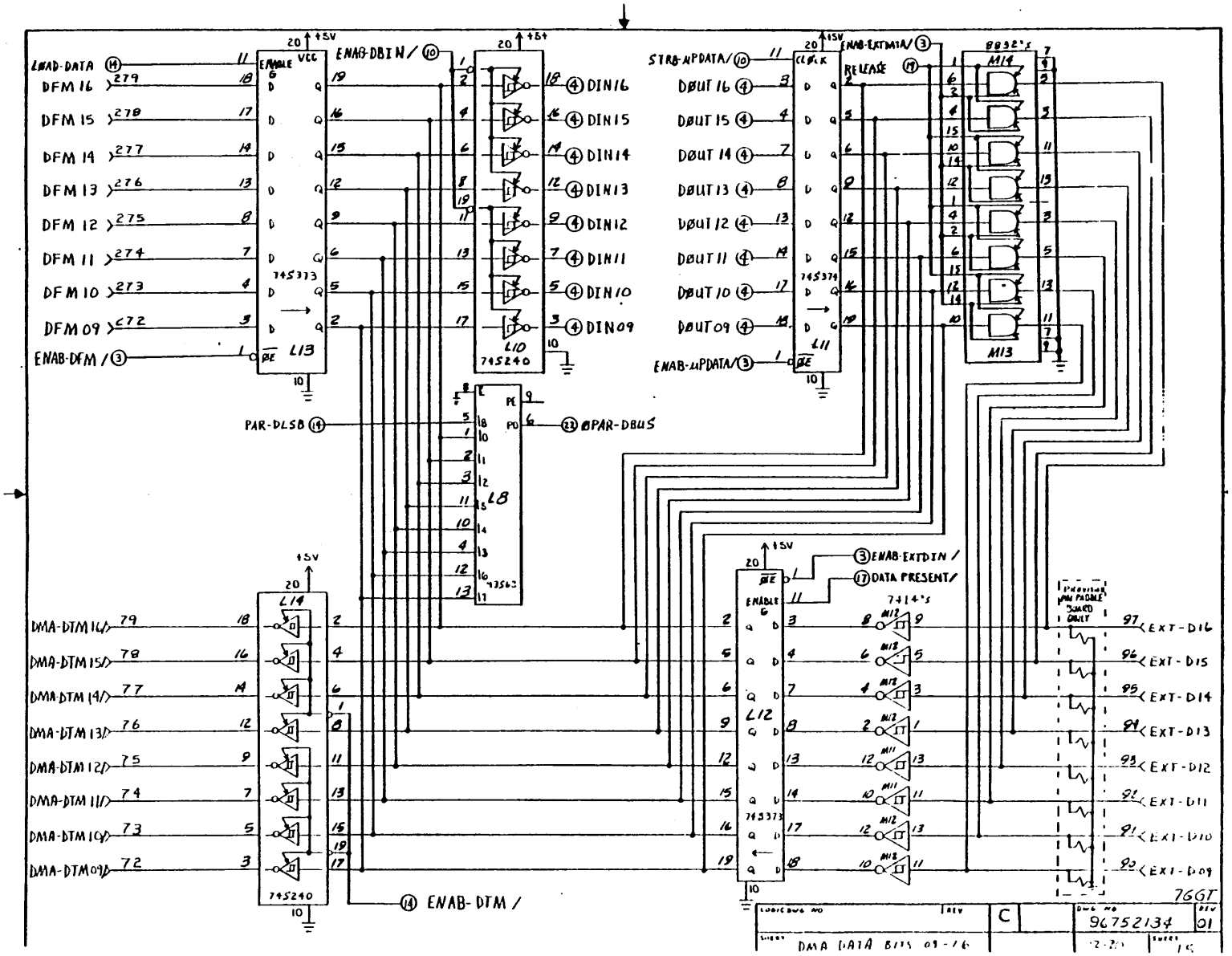


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 15 of 24)

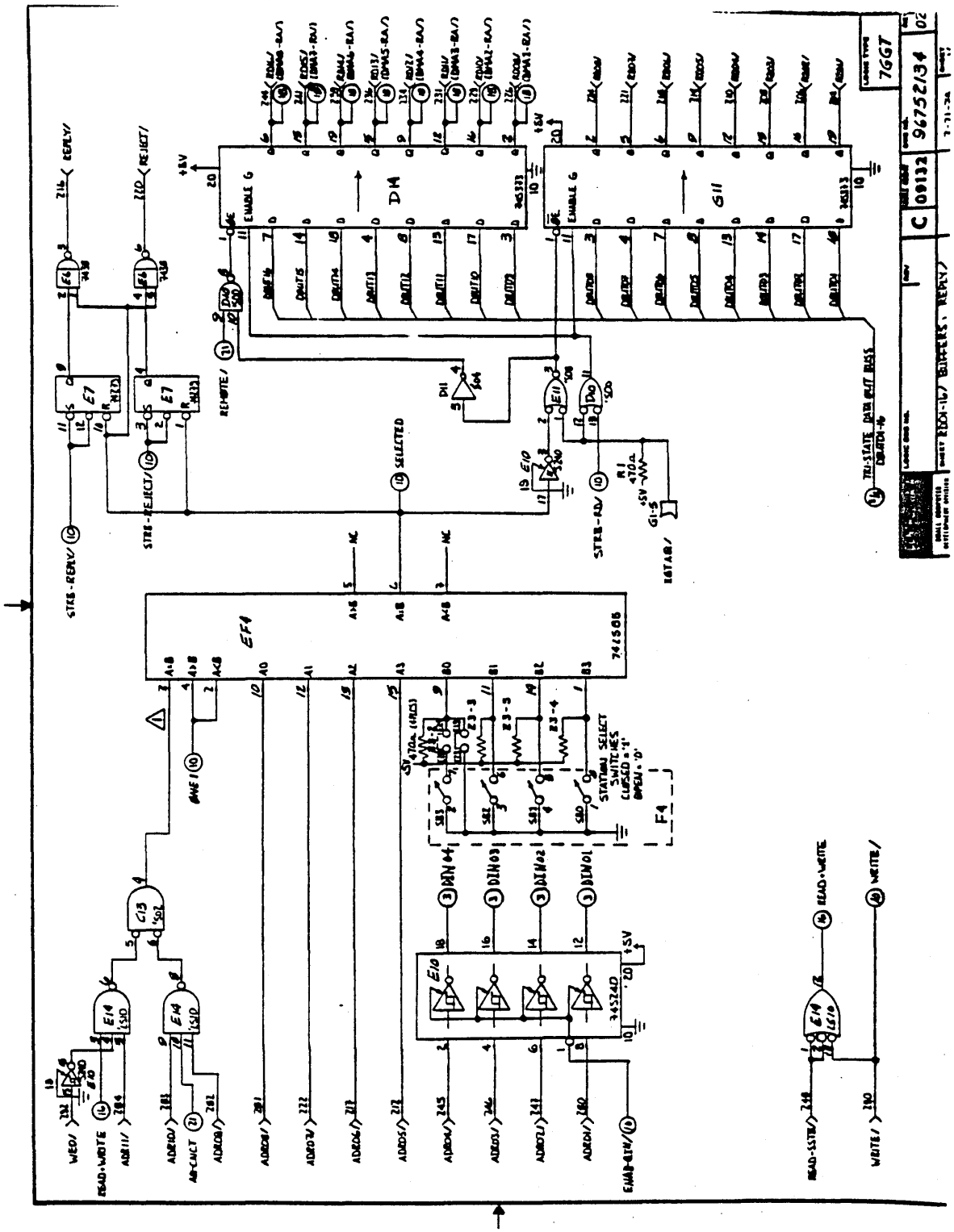


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 16 of 24)

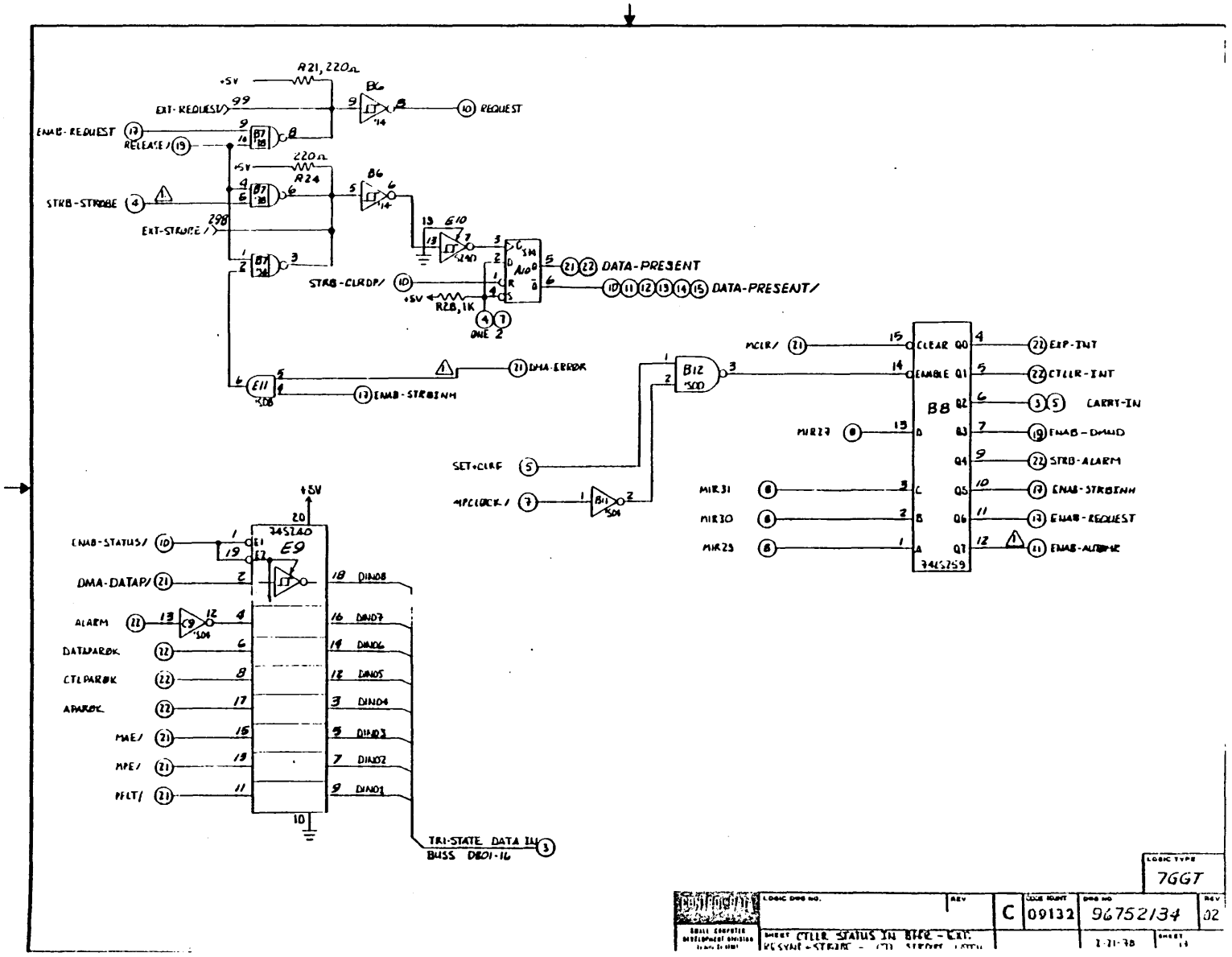


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 17 of 24)

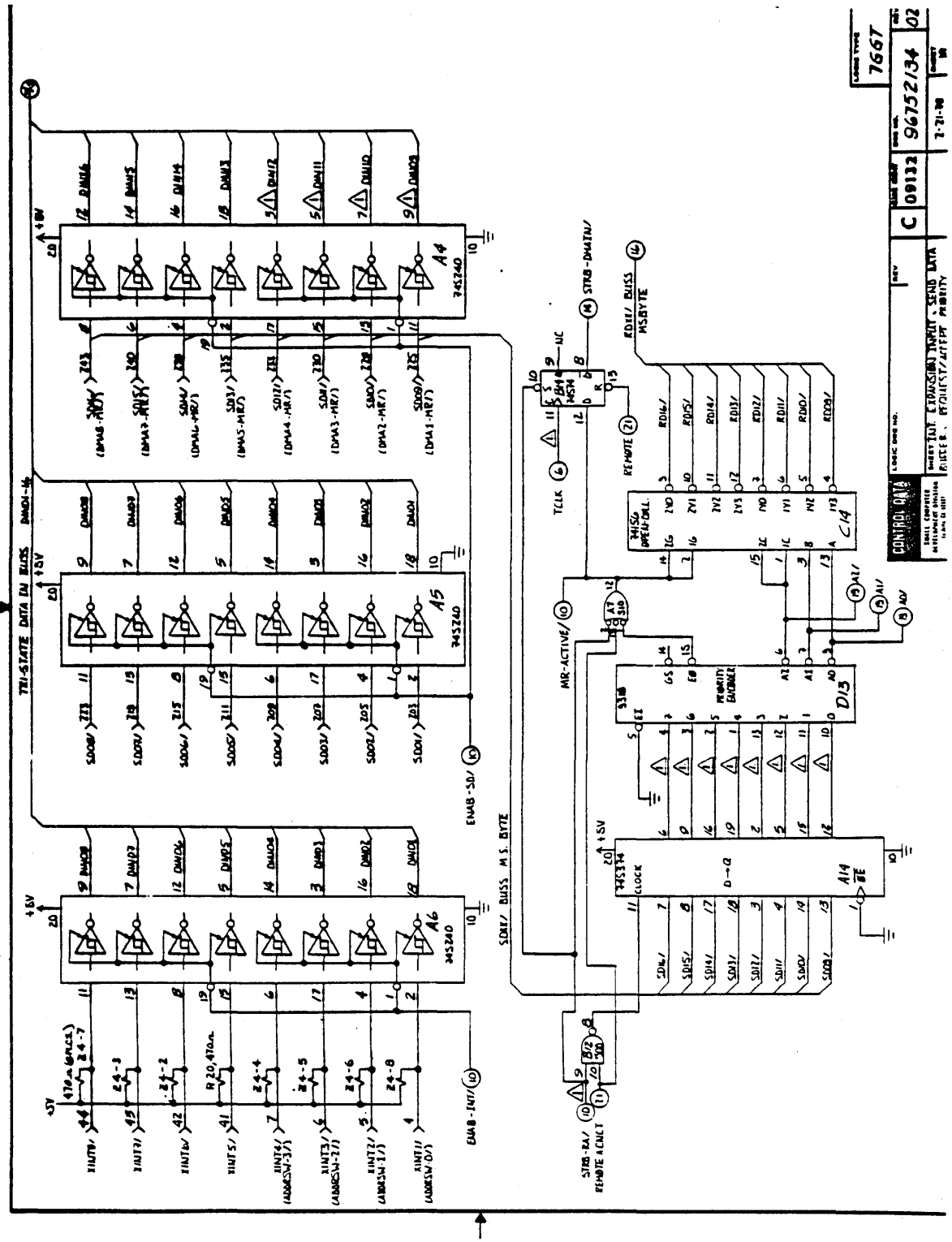


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 18 of 24)

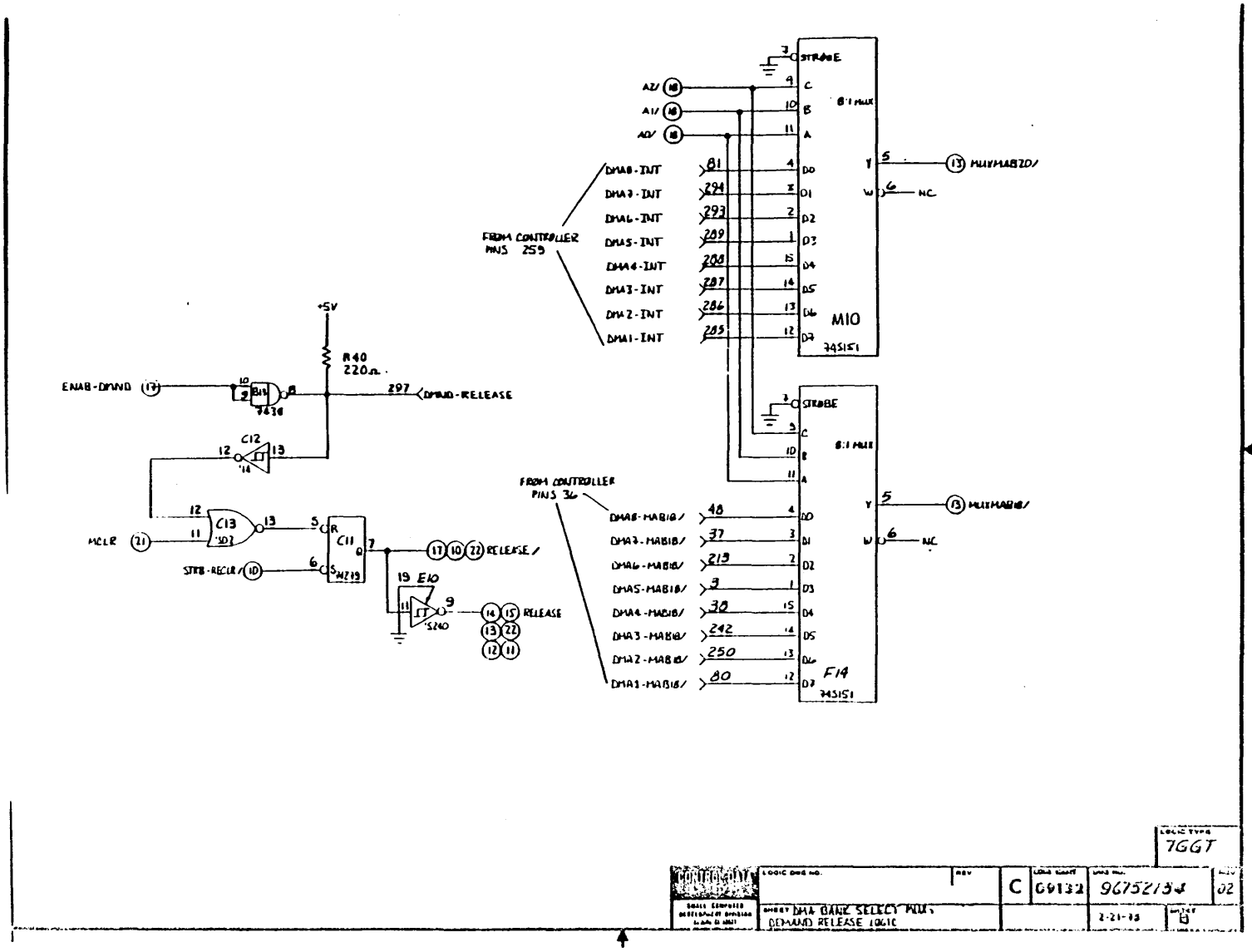


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 19 of 24)

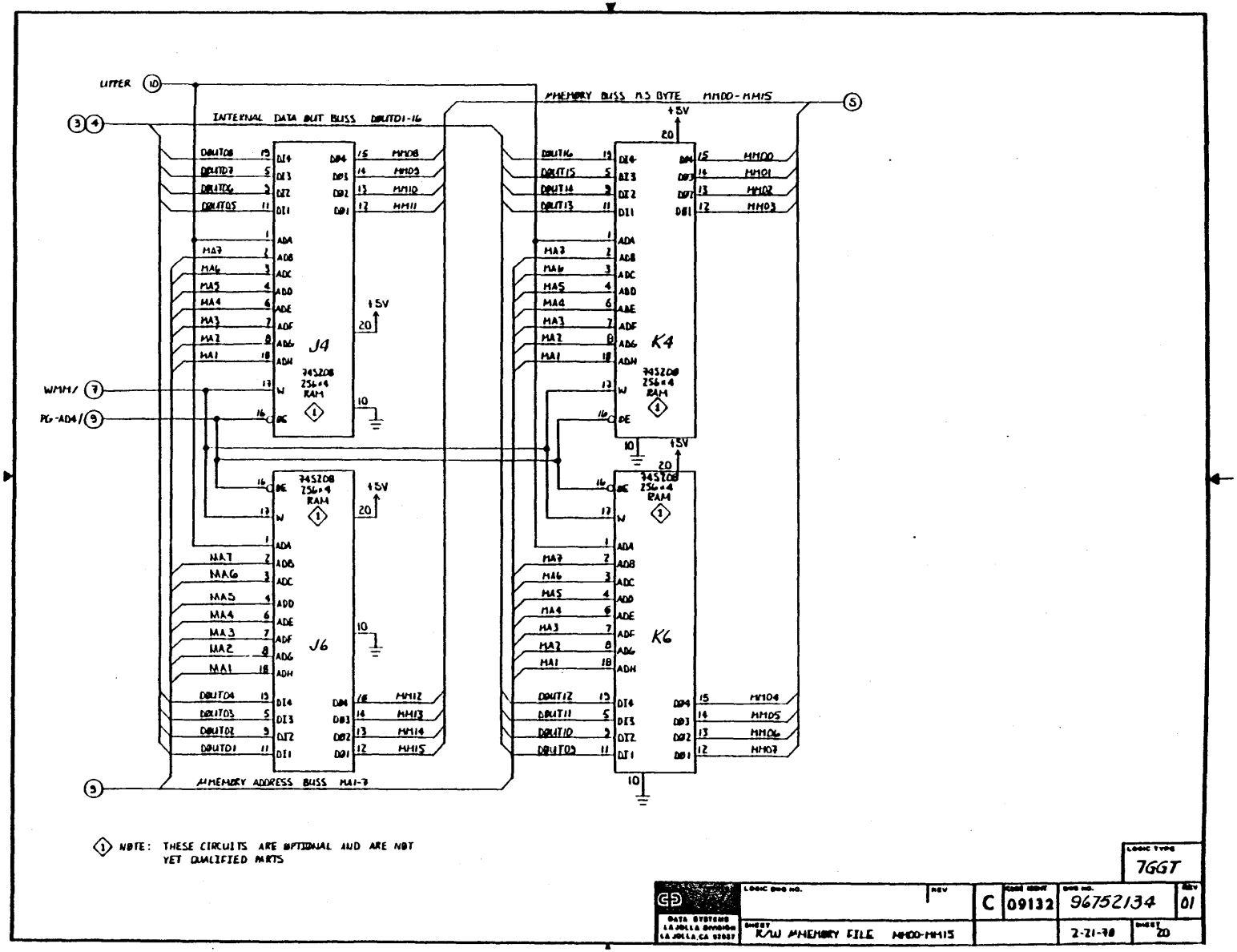


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 20 of 24)

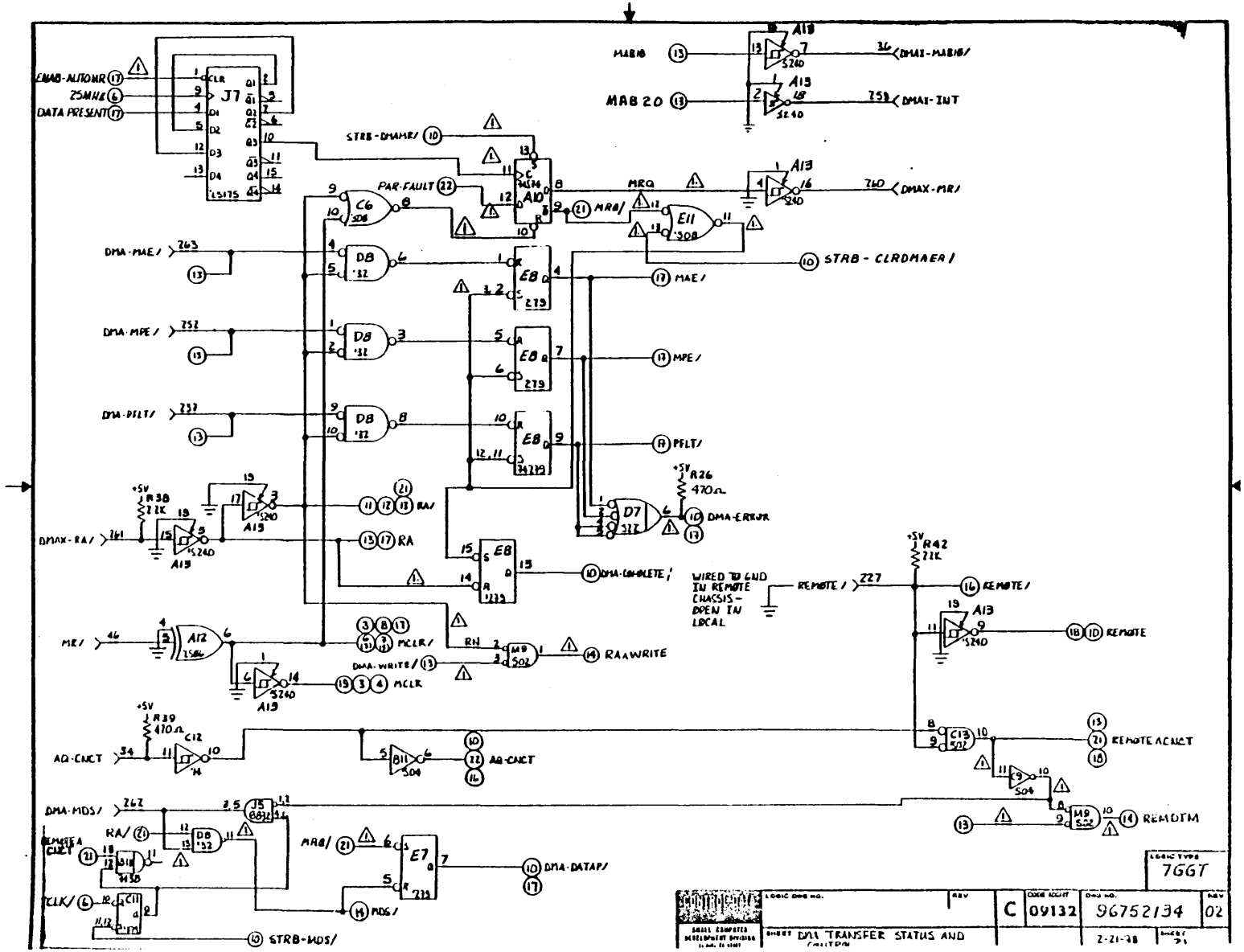


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 21 of 24)

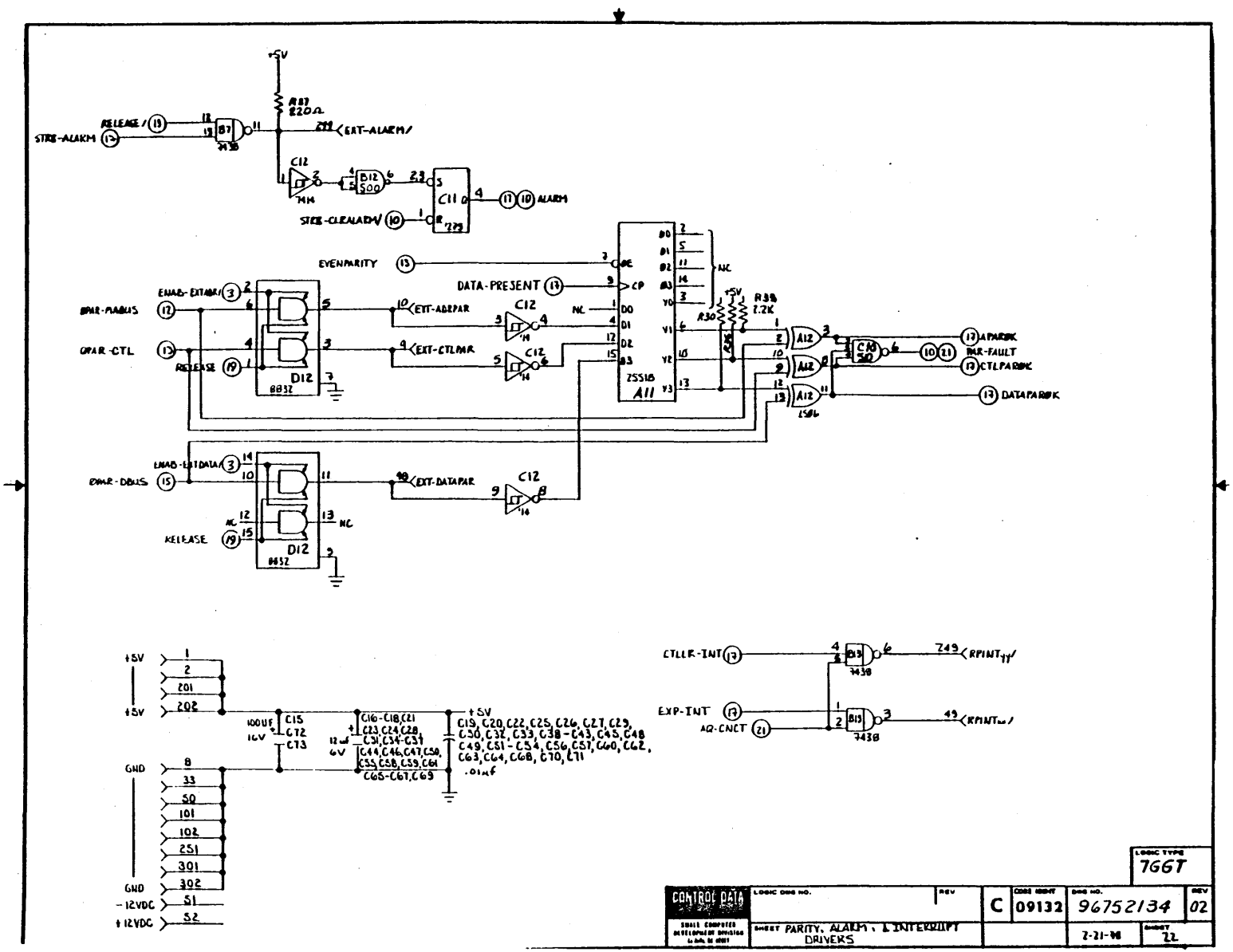


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 22 of 24)

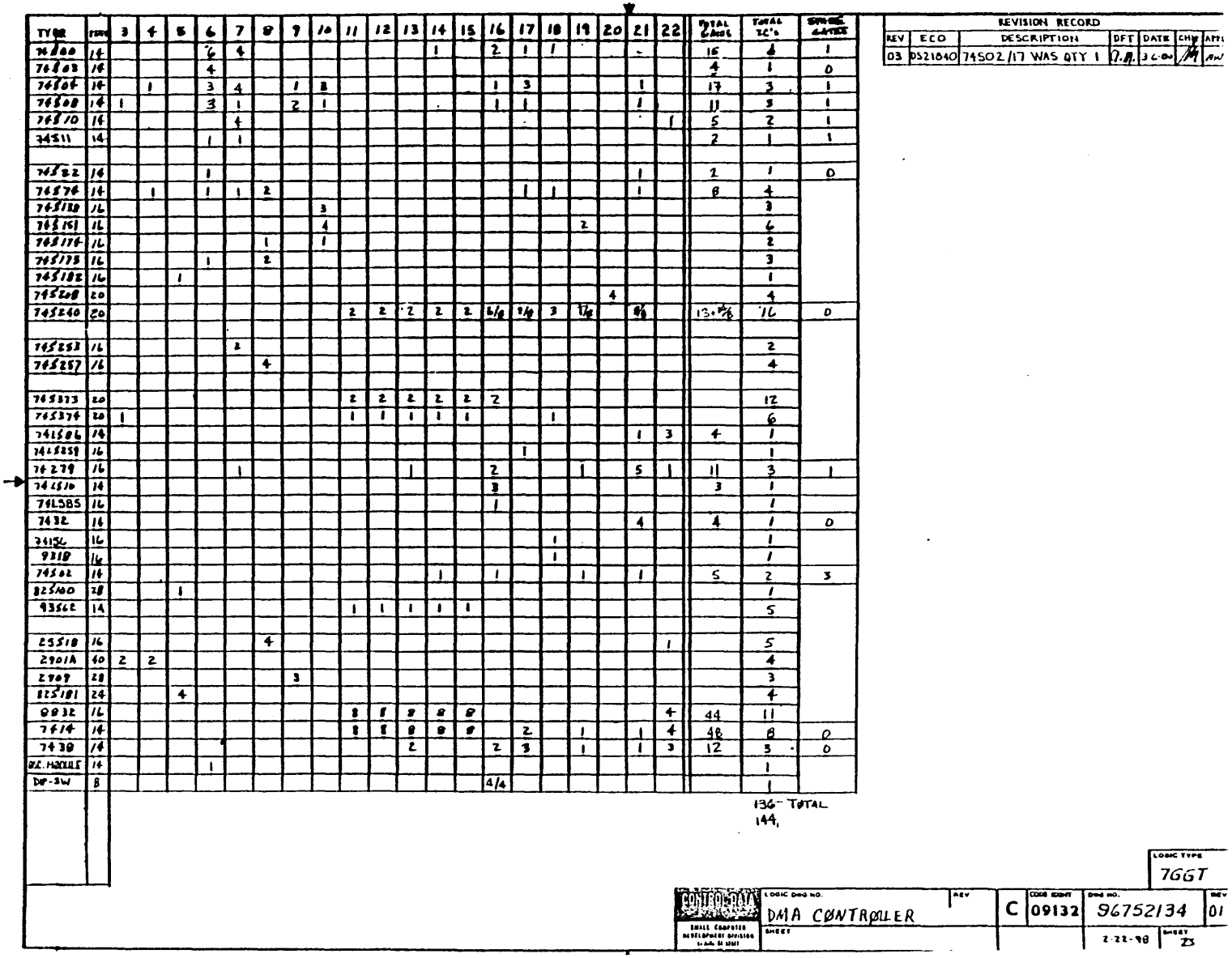


Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 23 of 24)

DMA CONTROLLER
9475213F

REV.	DATE	INITIAL
01		

PIN	PAGE	PROPOSITION NAME
1	22	+5VDC
2	22	+5V DC
3	19	DMA5-MAB18/
4	18	XINT1/(ADDRSM-C/)
5	18	XINT2/(ADDRSM-1/)
6	18	XINT3/(ADDRSM-2/)
7	18	XINT4/(ADDRSM-3/)
8	22	GND (added)
9	22	EXT-CTL PAR
10	22	EXT-ADR PAR
11	11	EXT-MAB01/
12	11	EXT-MAB02/
13	11	EXT-MAB03/
14	11	EXT-MAB04/
15	11	EXT-MAB05/
16	11	EXT-MAB06/
17	11	EXT-MAB07/
18	11	EXT-MAB08/
19	12	EXT-MAB09/
20	12	EXT-MAB10/
21	12	EXT-MAB11/
22	12	EXT-MAB12/
23	12	EXT-MAB13/
24	12	EXT-MAB14/
25	12	EXT-MAB15/
26	12	EXT-MAB16/
27	13	EXT-MAB17/(EXT-PELT/)
28	13	EXT-MAB18/(EXT-MPE/)
29	13	EXT-MAB19/(EXT-MAE/)
30	13	EXT-MAB20/
31	13	EXT-PRBT/
32	3	EXT-WRITE
33	22	GND (added)
34	21	AQ-CNCT
35	13	DMA-MAB17/
36	21	DMAX-MAB18/
37	19	DMA7-MAB18/
38	19	DMA4-MAB18/
39	13	SLOW DMA
40	22	GND (added)
41	18	XINT5/
42	18	XINT6/
43	18	XINT7/
44	18	XINT8/
45		—
46	21	MR/
47	13	DMA-MAB19/ or OPEN
48	19	DMAB-MAB18/
49	22	RPINTxx/
50	22	GND (added)
51	22	-12 VDC

PIN	PAGE	PROPOSITION NAME
52	22	+12 V DC
53	11	DMA-MAB01/
54	11	DMA-MAB02/
55	11	DMA-MAB03/
56	11	DMA-MAB04/
57	11	DMA-MAB09/
58	11	DMA-MAB06/
59	11	DMA-MAB07/
60	11	DMA-MAB08/
61	12	DMA-MAB07/
62	12	DMA-MAB10/
63	13	DMA-WRITE
64	14	DMA-DTM01
65	14	DMA-DTM02
66	14	DMA-DTM03
67	14	DMA-DTM04
68	14	DMA-DTM05
69	14	DMA-DTM06
70	14	DMA-DTM07
71	14	DMA-DTM08
72	15	DMA-DTM09
73	15	DMA-DTM10
74	15	DMA-DTM11
75	15	DMA-DTM12
76	15	DMA-DTM13
77	15	DMA-DTM14
78	15	DMA-DTM15
79	15	DMA-DTM16
80	19	DMA1-MAB18/
81	19	DMAB-INT
82	14	EXT-D01
83	14	EXT-D02
84	14	EXT-D03
85	14	EXT-D04
86	14	EXT-D05
87	14	EXT-D06
88	14	EXT-D07
89	14	EXT-D08
90	15	EXT-D09
91	15	EXT-D10
92	15	EXT-D11
93	15	EXT-D12
94	15	EXT-D13
95	15	EXT-D14
96	15	EXT-D15
97	15	EXT-D16
98	22	EXT-DATA PAR
99	17	EXT-REQUEST/
100		
101	22	GND
102	22	GND

PIN	PAGE	PROPOSITION NAME
201	22	+5VDC
202	22	+5V DC
203	18	SD01/
204	16	RD01/
205	18	SD02/
206	16	RD02/
207	18	SD03/
208	16	RD03/
209	18	SD04/
210	16	RD04/
211	18	SD05/
212	16	ADR05/
213	19	DMA6-MAB18/
214	16	RD05/
215	18	SD06/
216	16	REPLY/
217	16	ADR06/
218	16	RD06/
219	18	SD07/
220	16	REJECT/
221	16	RD07/
222	16	ADR07/
223	18	SD08/
224	16	RD08/
225	18	SD09/ (DMA3-MR/)
226	16	RD09/ (DMA1-RA/)
227	21	REMOTE/
228	18	SD10/ (DMA2-MR/)
229	16	RD10/ (DMA2-RA/)
230	18	SD11/ (DMA2-MR/)
231	16	RD11/ (DMA3-RA/)
232	13	DMA-PRBT/
233	18	SD12/ (DMA4-MR/)
234	16	RD12/ (DMA4-RA/)
235	18	SD13/ (DMA5-MR/)
236	16	RD13/ (DMA5-RA/)
237	21	DMA-PELT/
238	18	SD14/ (DMA6-MR/)
239	16	RD14/ (DMA6-RA/)
240	18	SD15/ (DMA7-MR/)
241	16	RD15/ (DMA7-RA/)
242	19	DMA3-MAB18/
243	18	SD16/ (DMAB-MR/)
244	16	RD16/ (DMAB-RA/)
245	16	ADR04/
246	16	ADR03/
247	16	ADR02/
248	16	READ-STB/
249	22	RPINTxx/
250	19	DMAE-MAB18/
251	22	GND (added)

PIN	PAGE	PROPOSITION NAME
252	21	DMA-MPE/
253	12	DMA-MAB11/
254	12	DMA-MAB12/
255	12	DMA-MAB13/
256	12	DMA-MAB14/
257	12	DMA-MAB15/
258	12	DMA-MAB16/
259	21	DMAX-INT
260	21	DMAx-MR/
261	21	DMAx-RA/
262	21	DMA-MD1/
263	21	DMA-MAE/
264	14	DEM01
265	14	DEM02
266	14	DEM03
267	14	DEM04
268	14	DEM05
269	14	DEM06
270	14	DEM07
271	14	DEM08
272	15	DEM09
273	15	DEM10
274	15	DEM11
275	15	DEM12
276	15	DEM13
277	15	DEM14
278	15	DEM15
279	15	DEM16
280	16	ADR01/
281	16	ADR08/
282	16	ADR09/
283	16	ADR10/
284	16	ADR11/
285	19	DMA1-INT
286	19	DMA2-INT
287	19	DMA3-INT
288	19	DMA4-INT
289	19	DMA5-INT
290	16	WRITE/
291	10	PROG-PRBT/
292	16	WE0/
293	19	DMA6-INT
294	19	DMA7-INT
295	13	EXT-CONNECT/
296	13	EXT-DATA/
297	19	DMAD-RELEASE/
298	17	EXT-STROBE/
299	22	EXT-ALARM/
300		
301	22	GND
302	22	GND

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Figure 5-5. DMA Extender (DMAX) Logic Diagram, 7GGT (Sheet 24 of 24)

IFV/19303-1

SIGNAL	PIN	CROSS REF. NO
ADR01/	280	0117
ADR02/	247	0117
ADR03/	246	0117
ADR04/	245	0117
ADR05/	212	0117
ADR06/	217	0117
ADR07/	222	0117
ADR08/	281	0117
ADR09/	282	0117
ADR10/	283	0117
ADR11/	284	0117
AQ-CNCT	34	0121
DFM01 (DMA DTM01/)	264	0115
DFM02 (DMA DTM02/)	265	0115
DFM03 (DMA DTM03/)	266	0115
DFM04 (DMA DTM04/)	267	0115
DFM05 (DMA DTM05/)	268	0115
DFM06 (DMA DTM06/)	269	0115
DFM07 (DMA DTM07/)	270	0115
DFM08 (DMA DTM08/)	271	0115
DFM09 (DMA DTM09/)	272	0116
DFM10 (DMA DTM10/)	273	0116
DFM11 (DMA DTM11/)	274	0116
DFM12 (DMA DTM12/)	275	0116
DFM13 (DMA DTM13/)	276	0116
DFM14 (DMA DTM14/)	277	0116
DFM15 (DMA DTM15/)	278	0116
DFM16 (DMA DTM16/)	279	0116
DMA1-INT	285	0120
DMA2-INT	286	0120
DMA3-INT	287	0120
DMA4-INT	288	0120
DMA5-INT	289	0120
DMA6-INT	293	0120
DMA7-INT	294	0120
DMA8-INT	81	0120
(DMA1-MAB18/)	80	0120
(DMA2-MAB18/)	250	0120
(DMA3-MAB18/)	242	0120
(DMA4-MAB18/)	38	0120
(DMA5-MAB18/)	3	0120
(DMA6-MAB18/)	213	0120
(DMA7-MAB18/)	37	0120
(DMA8-MAB18/)	48	0120
DMA-DTM01 (DFM01)	64	0115
DMA-DTM02 (DFM02)	65	0115
DMA-DTM03 (DFM03)	66	0115
DMA-DTM04 (DFM04)	67	0115
DMA-DTM05 (DFM05)	68	0115
DMA-DTM06 (DFM06)	69	0115
DMA-DTM07 (DFM07)	70	0115
DMA-DTM08 (DFM08)	71	0115
DMA-DTM09 (DFM09)	72	0116
DMA-DTM10 (DFM10)	73	0116
DMA-DTM11 (DFM11)	74	0116
DMA-DTM12 (DFM12)	75	0116
DMA-DTM13 (DFM13)	76	0116
DMA-DTM14 (DFM14)	77	0116
DMA-DTM15 (DFM15)	78	0116
DMA-DTM16 (DFM16)	79	0116
DMA-MAB01/	53	0112

SIGNAL	PIN	CROSS REF. NO
DMA-MAB02/	54	0112
DMA-MAB03/	55	0112
DMA-MAB04/	56	0112
DMA-MAB05/	57	0112
DMA-MAB06/	58	0112
DMA-MAB07/	59	0112
DMA-MAB08/	60	0112
DMA-MAB09/	61	0113
DMA-MAB10/	62	0113
DMA-MAB11/	253	0113
DMA-MAB12/	254	0113
DMA-MAB13/	255	0113
DMA-MAB14/	256	0113
DMA-MAB15/	257	0113
DMA-MAB16/	258	0113
DMA-MAB17/	35	0114
DMA-MAB19/ØR ØPEN	47	0114
DMA-MAE/	263	0121
DMA-MDS/	262	0121
DMA-MPE/	252	0121
DMA-PFLT/	237	0121
DMA-PRØT/	232	0114
DMA-WRITE	63	0114
DMAX-MAB18/	36	0121
DMAX-MR/	260	0121
DMAX-RA/	261	0121
DMND-RELEASE/	297	0120
EXT-ADRPAR	10	0122
EXT-ALARM/	299	0122
EXT-CB6/	295	0114
EXT-CB7/	296	0114
EXT-CTLPAR	9	0122
EXT-D01	82	0115
EXT-D02	83	0115
EXT-D03	84	0115
EXT-D04	85	0115
EXT-D05	86	0115
EXT-D06	87	0115
EXT-D07	88	0115
EXT-D08	89	0115
EXT-D09	90	0116
EXT-D10	91	0116
EXT-D11	92	0116
EXT-D12	93	0116
EXT-D13	94	0116
EXT-D14	95	0116
EXT-D15	96	0116
EXT-D16	97	0116
EXT-DATAPAR	98	0122
EXT-MAB01/	11	0112
EXT-MAB02/	12	0112
EXT-MAB03/	13	0112
EXT-MAB04/	14	0112
EXT-MAB05/	15	0112
EXT-MAB06/	16	0112
EXT-MAB07/	17	0112
EXT-MAB08/	18	0112
EXT-MAB09/	19	0113
EXT-MAB10/	20	0113
EXT-MAB11/	21	0113
EXT-MAB12/	22	0113

SIGNAL	PIN	CROSS REF. NO
EXT-MAB13/	23	0113
EXT-MAB14/	24	0113
EXT-MAB15/	25	0113
EXT-MAB16/	26	0113
EXT-MAB17/(EXT-PFLT/)	27	0114
EXT-MAB18/(EXT-MPE/)	28	0114
EXT-MAB19/(EXT-MAE/)	29	0114
EXT-MAB20/	30	0114
EXT-PRØT/	31	0114
EXT-REQUEST/	99	0118
EXT-STRØBE/	298	0118
EXT-WRITE	32	0114
GND (ADDED)	8	0103
GND (ADDED)	33	0103
GND (ADDED)	40	0103
GND (ADDED)	50	0103
GND	101	0103
GND	102	0103
GND (ADDED)	251	0103
GND	301	0103
GND	302	0103
MR/	46	0121
PRØG-PRØT/	291	0111
RD01/	204	0117
RD02/	206	0117
RD03/	208	0117
RD04/	210	0117
RD05/	214	0117
RD06/	218	0117
RD07/	221	0117
RD08/	224	0117
RD09/ (DMA1-RA/)	226	0117
RD10/ (DMA2-RA/)	229	0117
RD11/ (DMA3-RA/)	231	0117
RD12/ (DMA4-RA/)	234	0117
RD13/ (DMA5-RA/)	236	0117
RD14/ (DMA6-RA/)	239	0117
RD15/ (DMA7-RA/)	241	0117
RD16/ (DMA8-RA/)	244	0117
READ-SSTB/	248	0117
REJECT/	220	0117
REMØTE/	227	0121
REPLY/	216	0117
RPINTXX/	49	0122
RPINTYY/	249	0122
SD01/	203	0119
SD02/	205	0119
SD03/	207	0119
SD04/	209	0119

SIGNAL	PIN	CROSS REF. NO
SD05/	211	0119
SD06/	215	0119
SD07/	219	0119
SD08/	223	0119
SD09/(DMA1-MR/)	225	0119
SD10/(DMA2-MR/)	228	0119
SD11/(DMA3-MR/)	230	0119
SD12/(DMA4-MR/)	233	0119
SD13/(DMA5-MR/)	235	0119
SD14/(DMA6-MR/)	238	0119
SD15/(DMA7-MR/)	240	0119
SD16/(DMA8-MR/)	243	0119
SLØW DMA	39	0114
WEO/	292	0117
WRITE/	290	0117
(XINT1/)	4	0119
(XINT2/)	5	0119
(XINT3/)	6	0119
(XINT4/)	7	0119
(XINT5/)	41	0119
(XINT6/)	42	0119
(XINT7/)	43	0119
(XINT8/)	44	0119
+5VDC	1	0103
+5VDC	2	0103
+5VDC	201	0103
+5VDC	202	0103
-12VDC	51	0103
+12VDC	52	0103

REVISION RECORD					
REV	ECØ	DESCRIPTION	DRFT	DATE	APP
A	[illegible]	CL A RELEASED	[illegible]	[illegible]	[illegible]

LØGIC TYPE 9MJT

CONTROL DATA CORPORATION — DATA SYSTEMS LA JOLLA, CALIFORNIA

FINST USED ON: BU272-A

DR

CHK

ENGR

MFG

APPD

TITLE: LØGIC DIAGRAM - DMA EXTENDER

CODE IDENT	DWG NO.
09132	96890780

C

C101

SHEET 1 OF 22

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all listing Divisions per CDC-STD 1.91.024.

A4L830

Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 1 of 22)

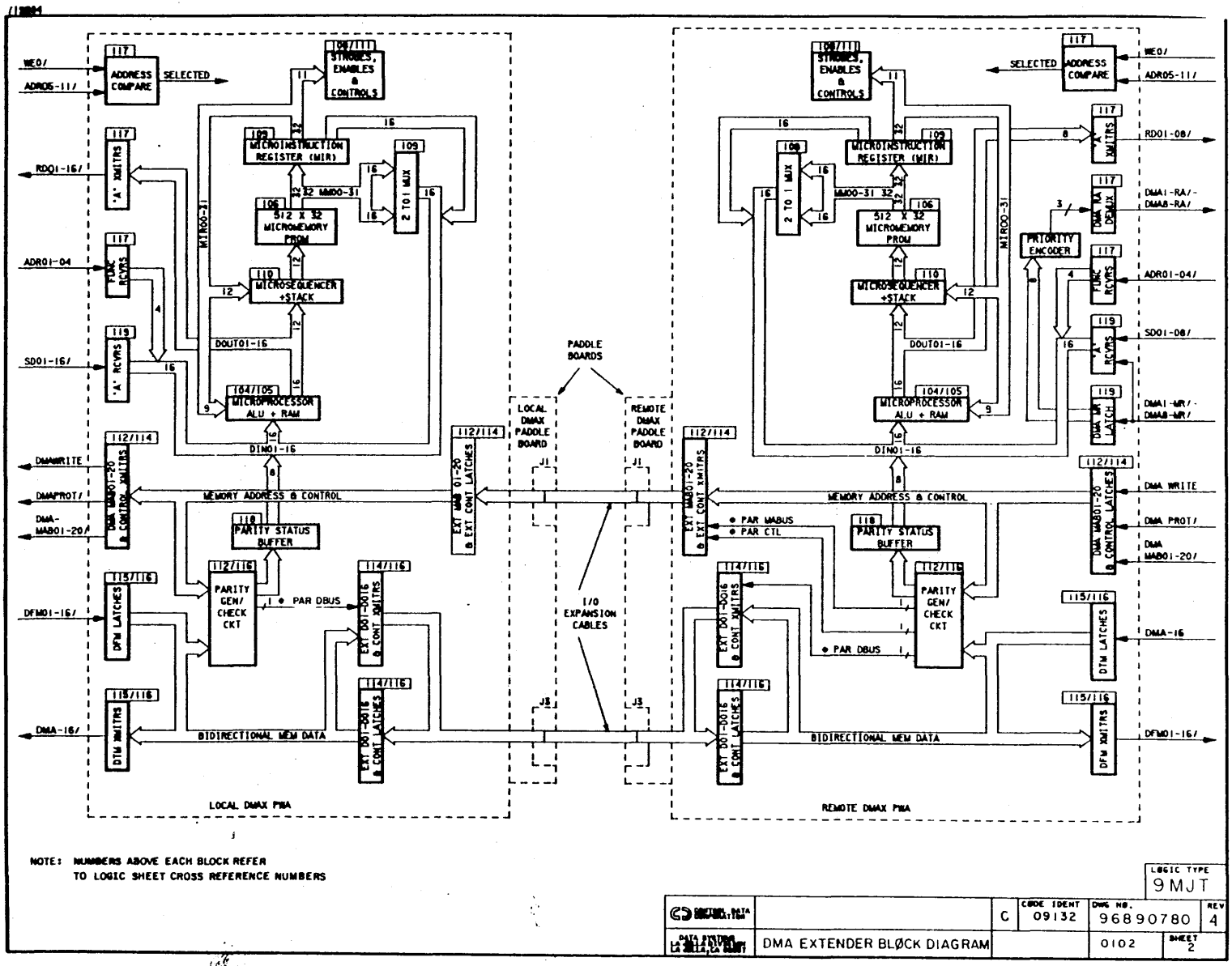


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 2 of 22)

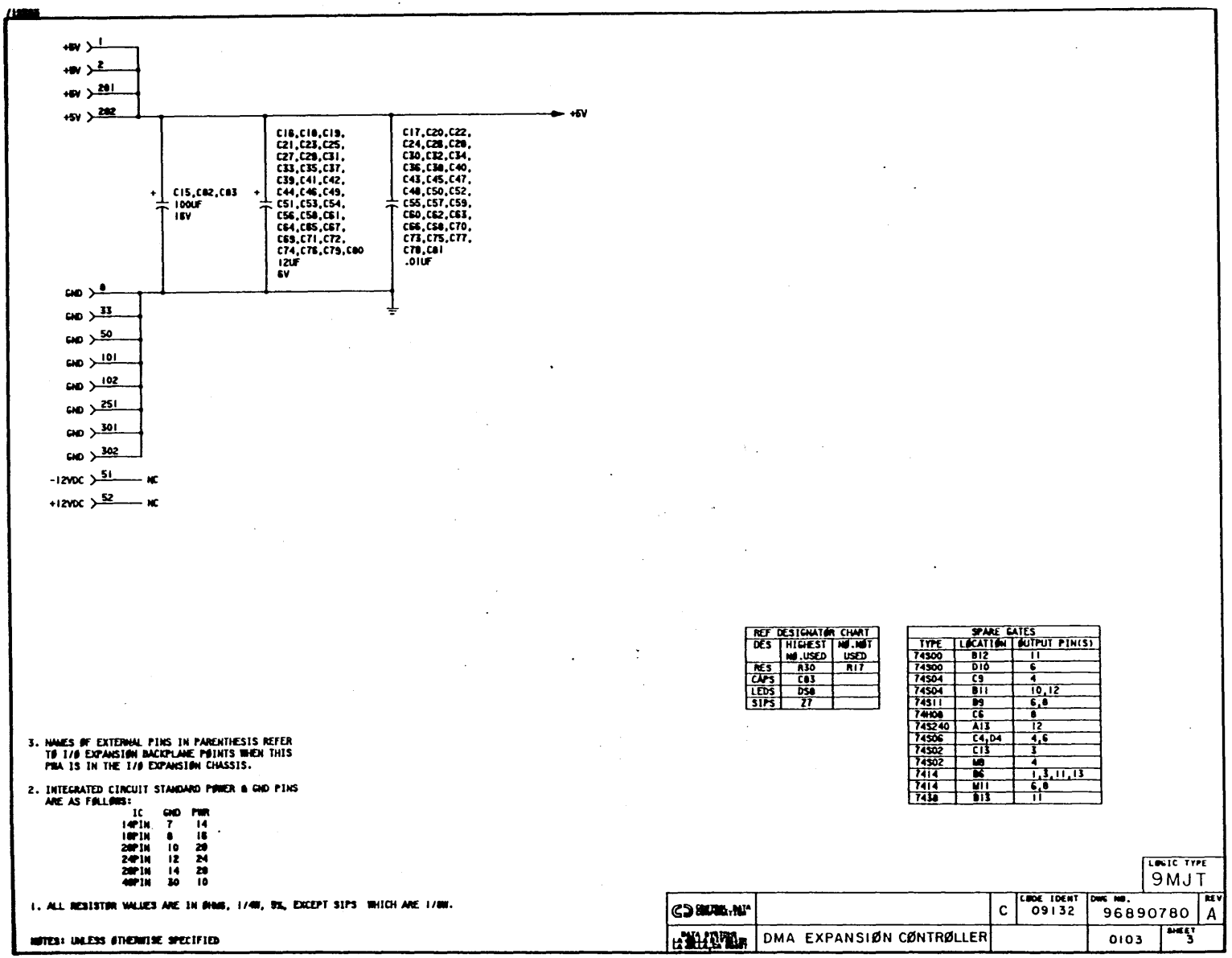


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 3 of 22)

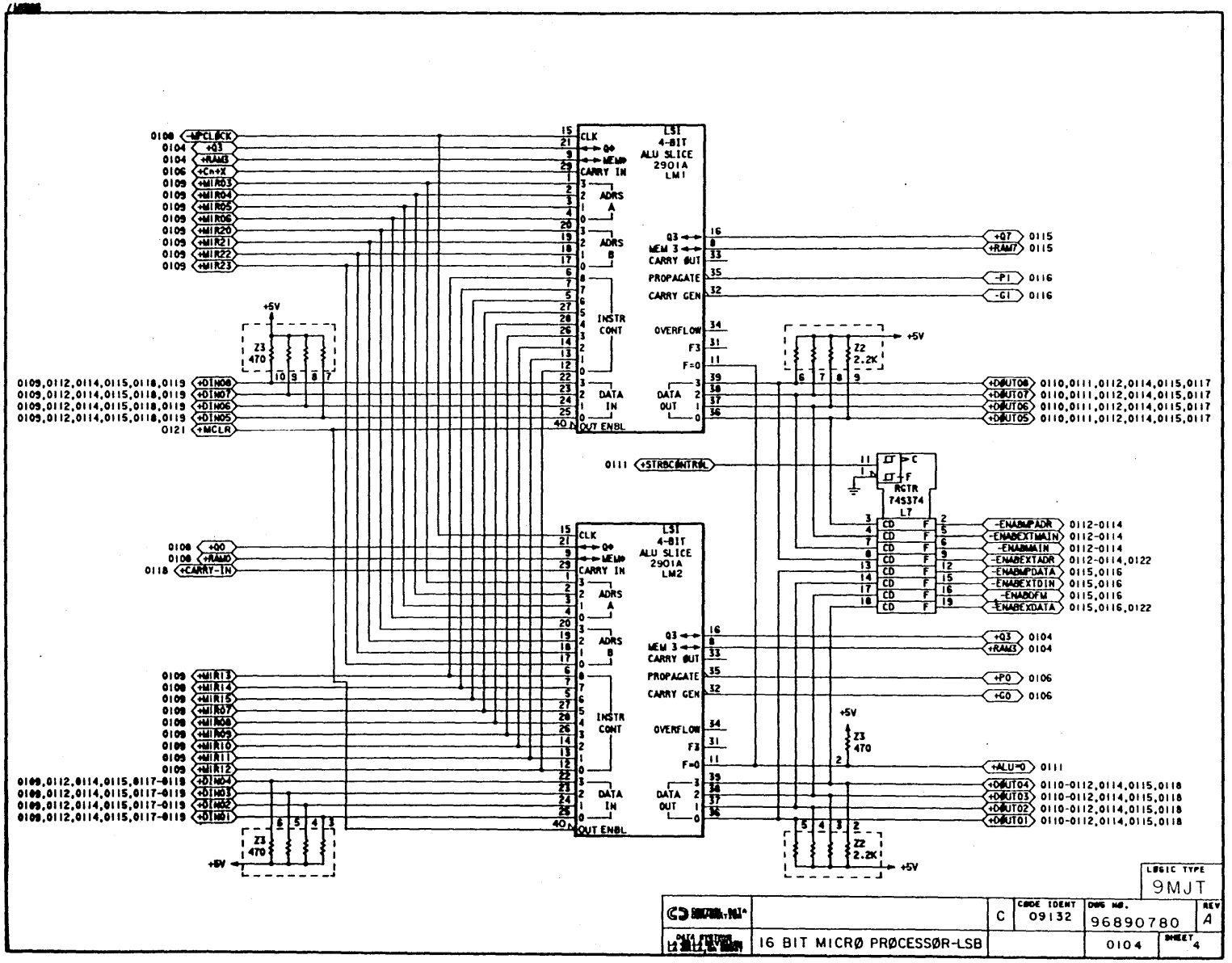


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 4 of 22)

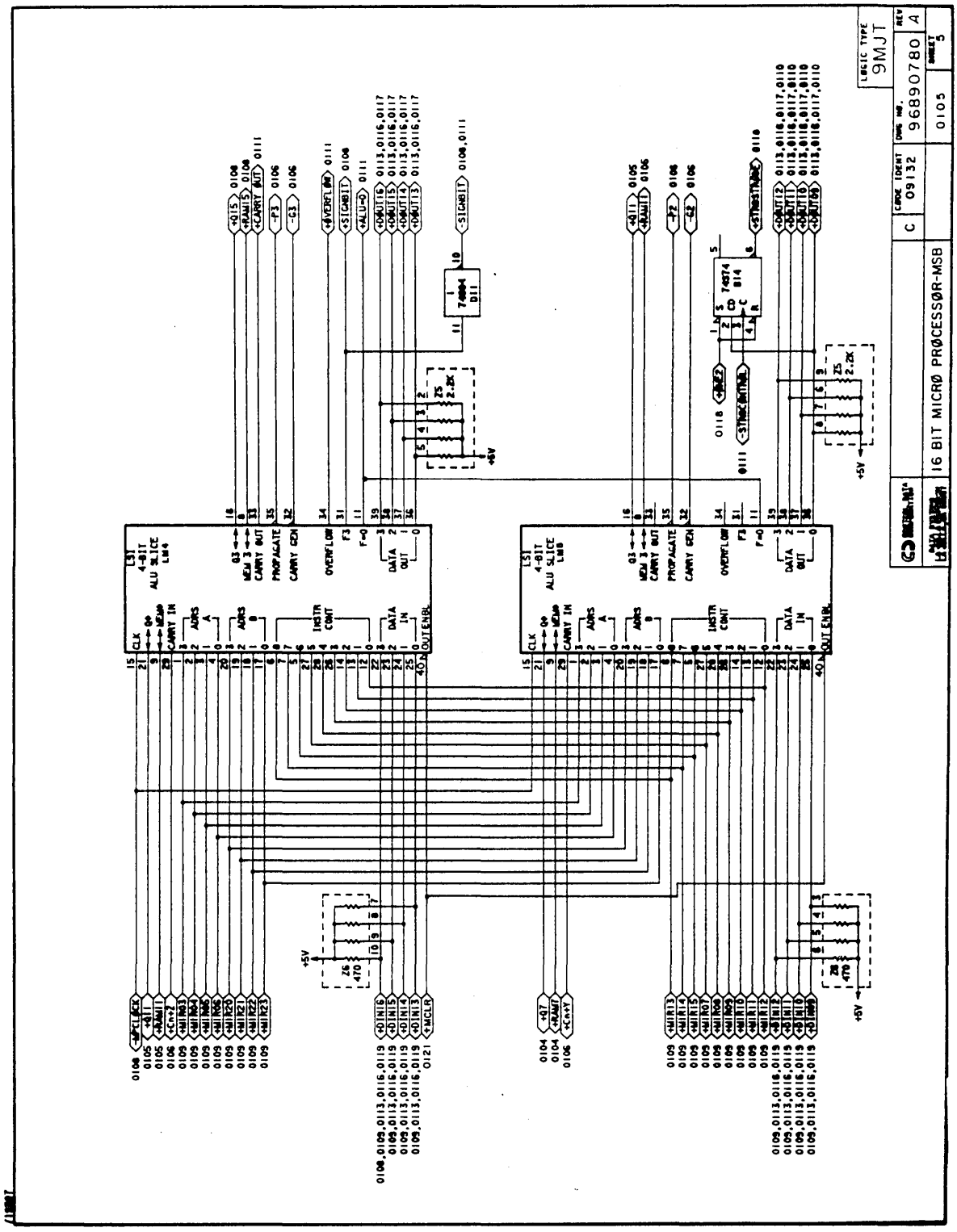


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 5 of 22)

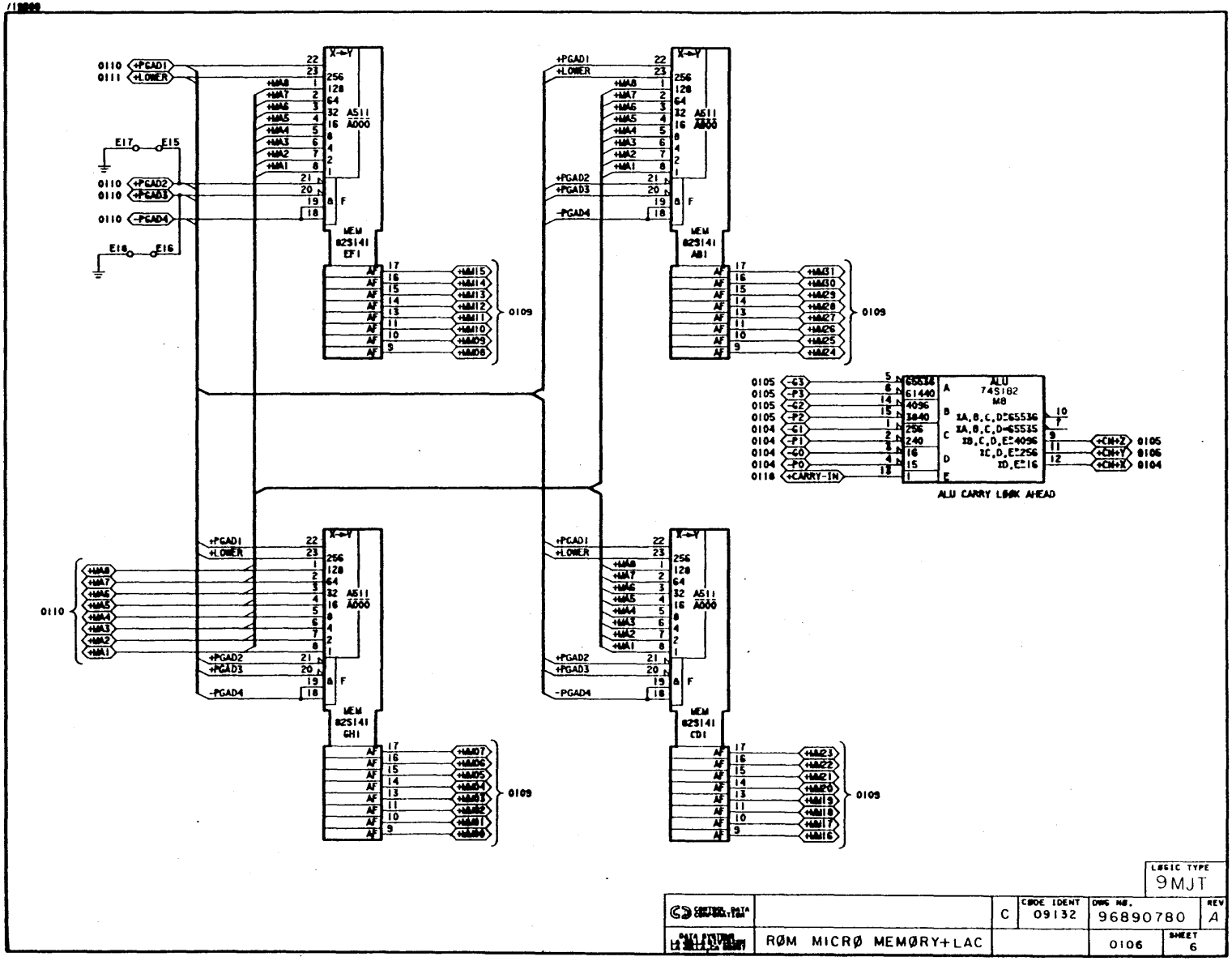


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 6 of 22)

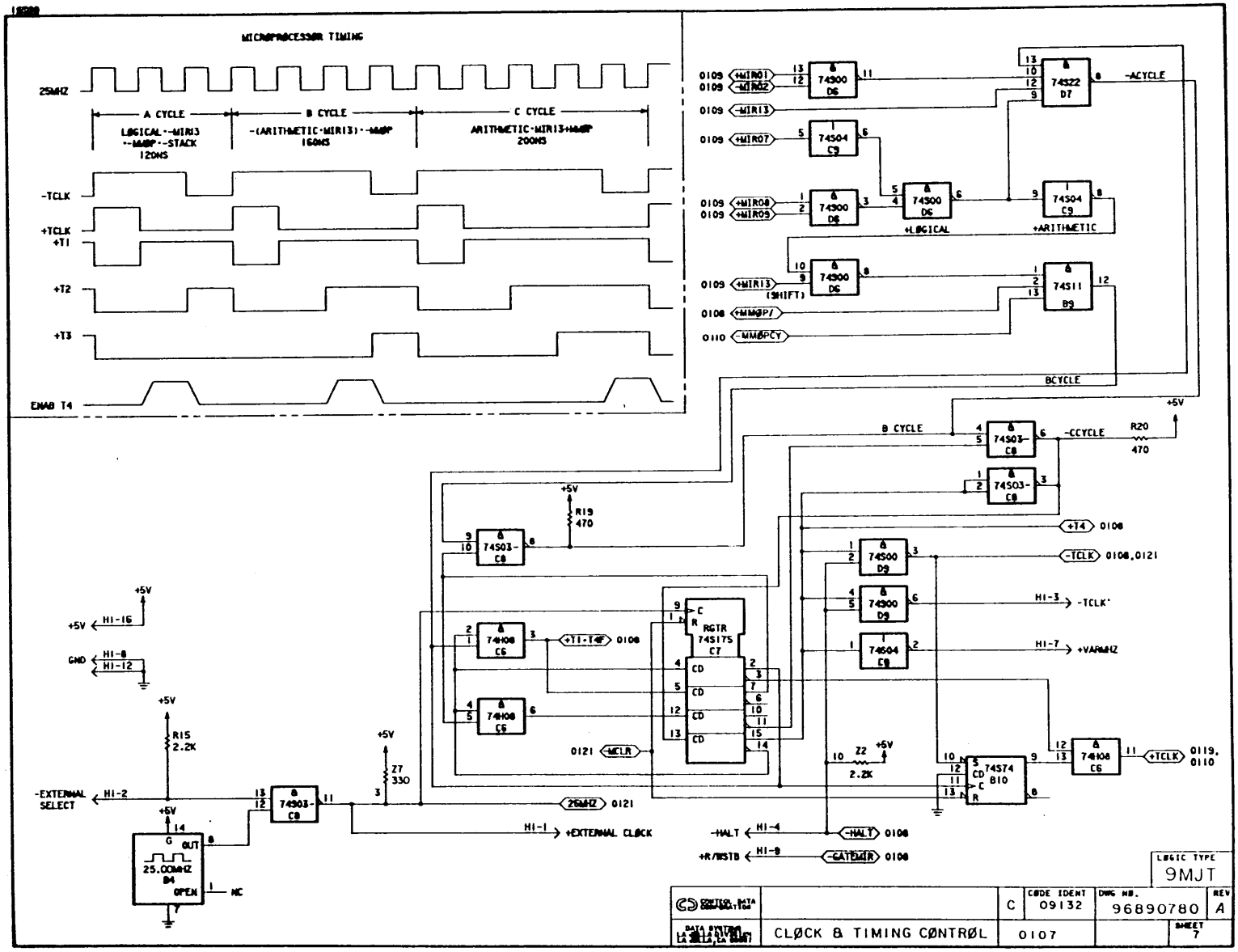


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 7 of 22)

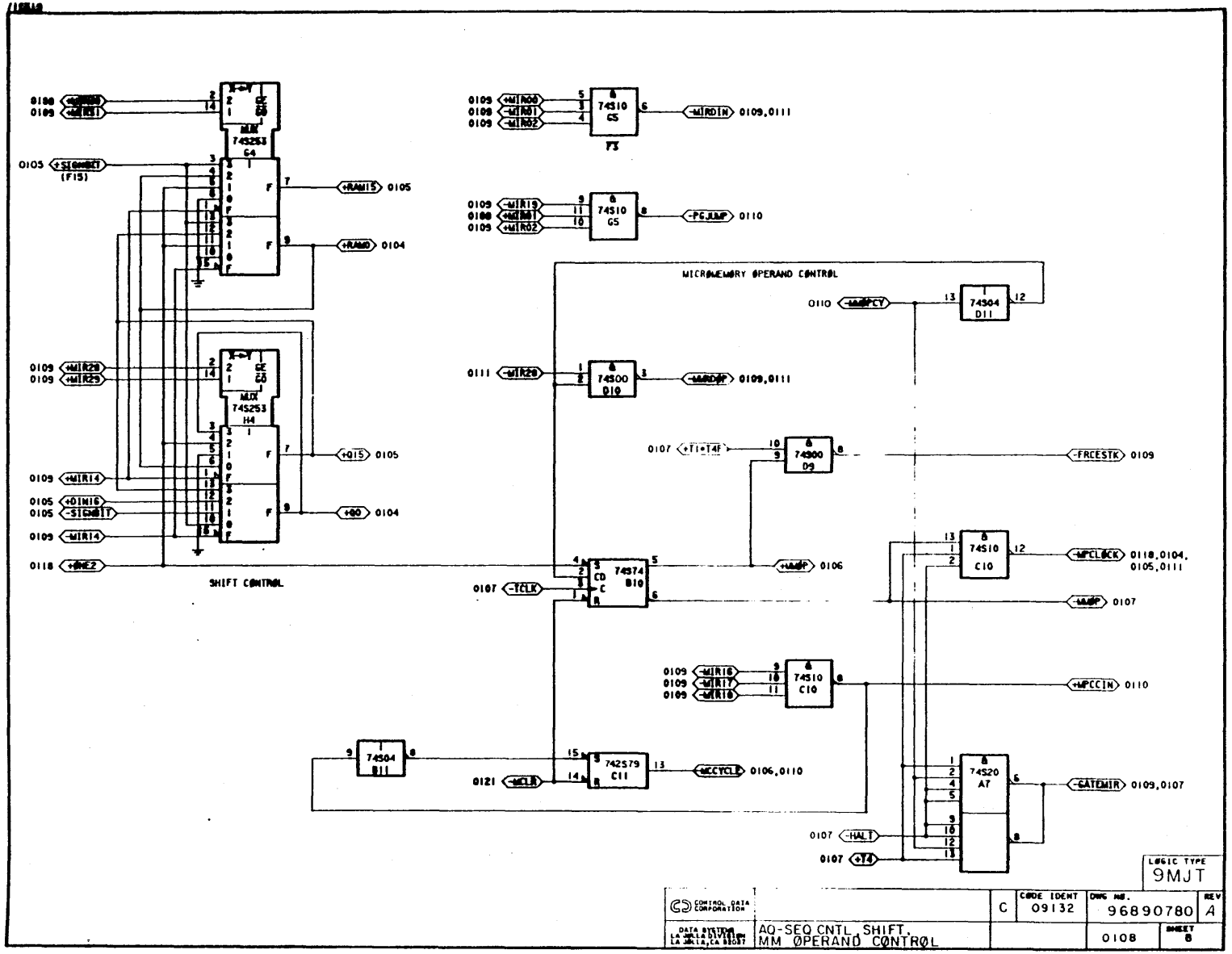


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 8 of 22)

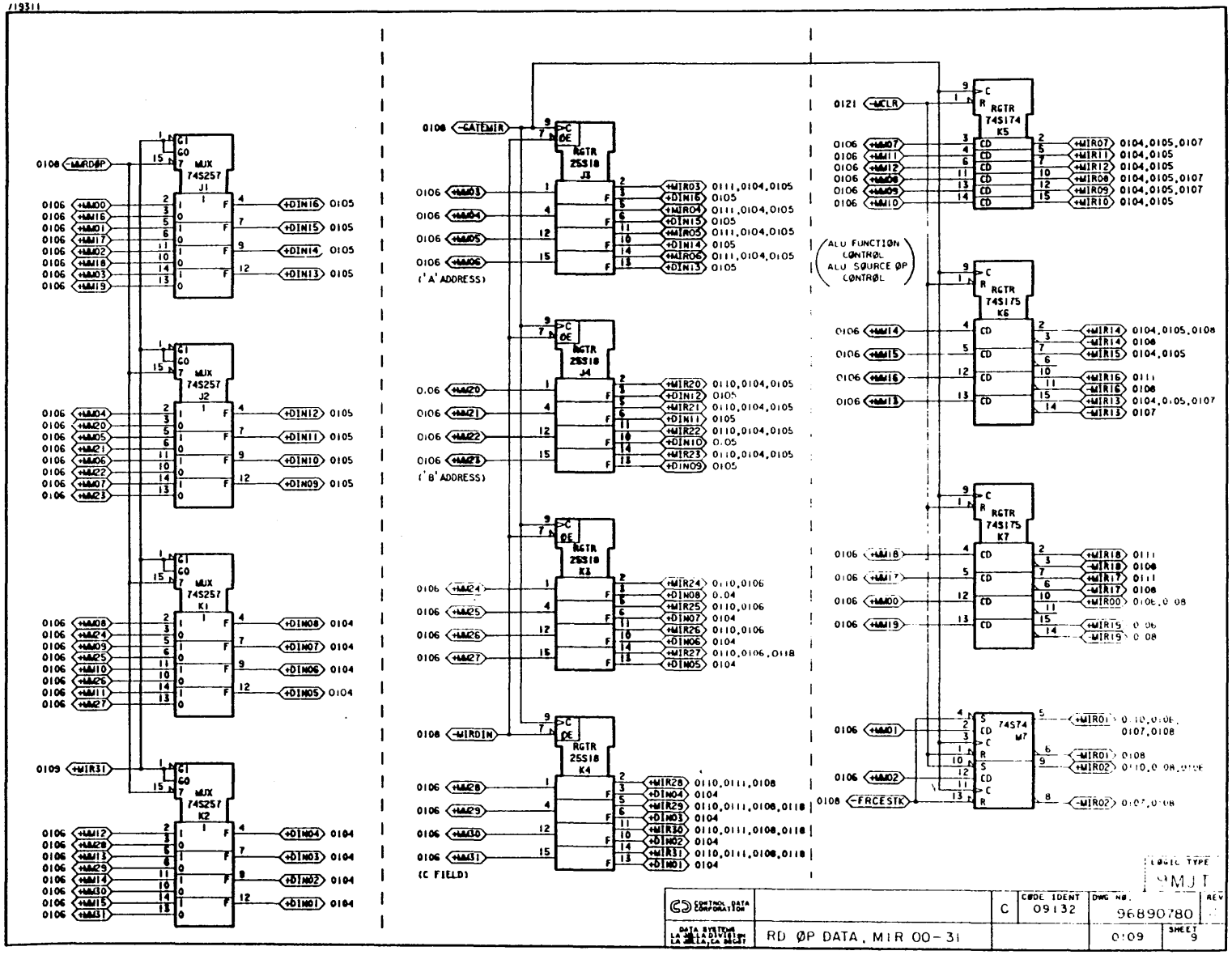


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 9 of 22)

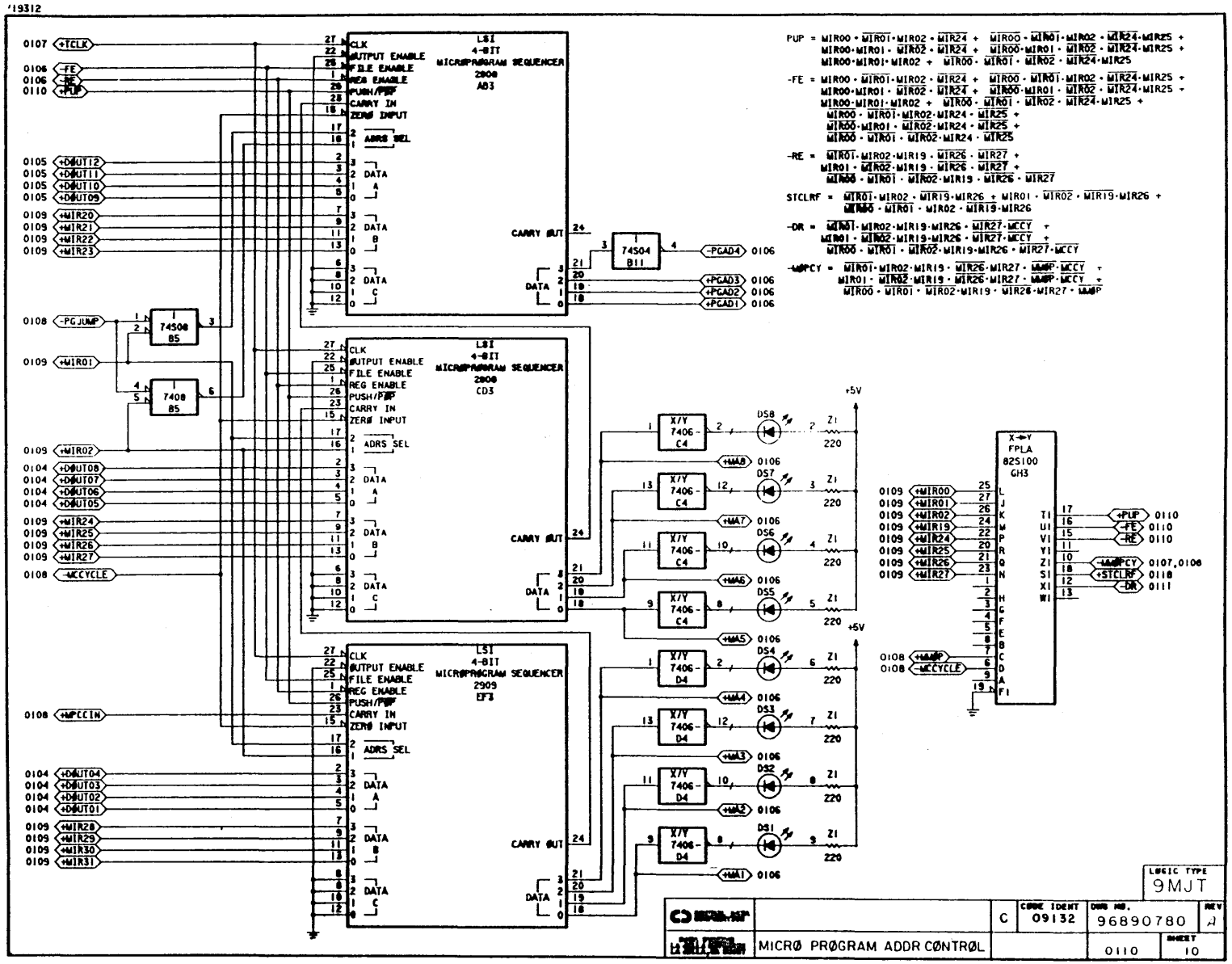


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 10 of 22)

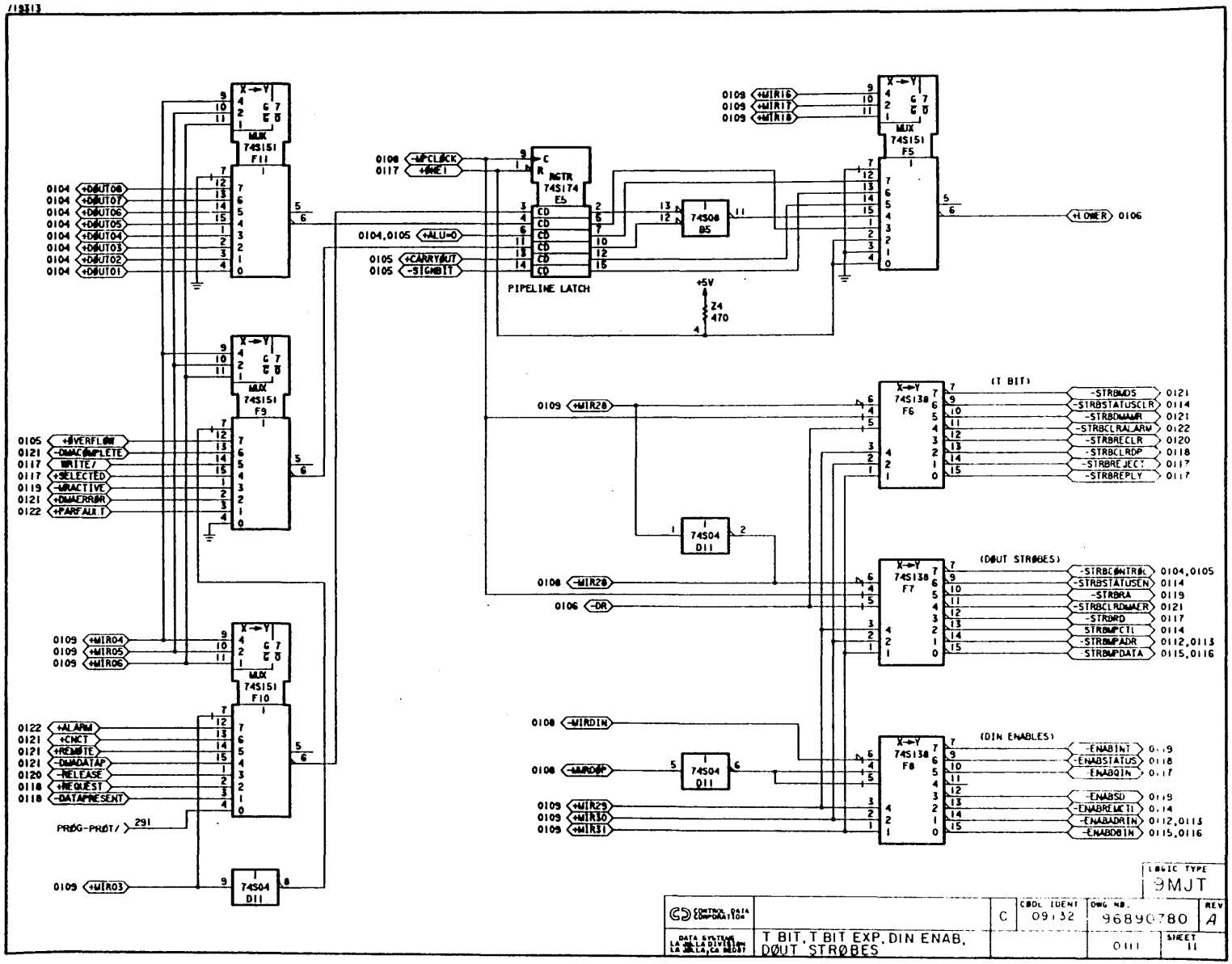


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 11 of 22)

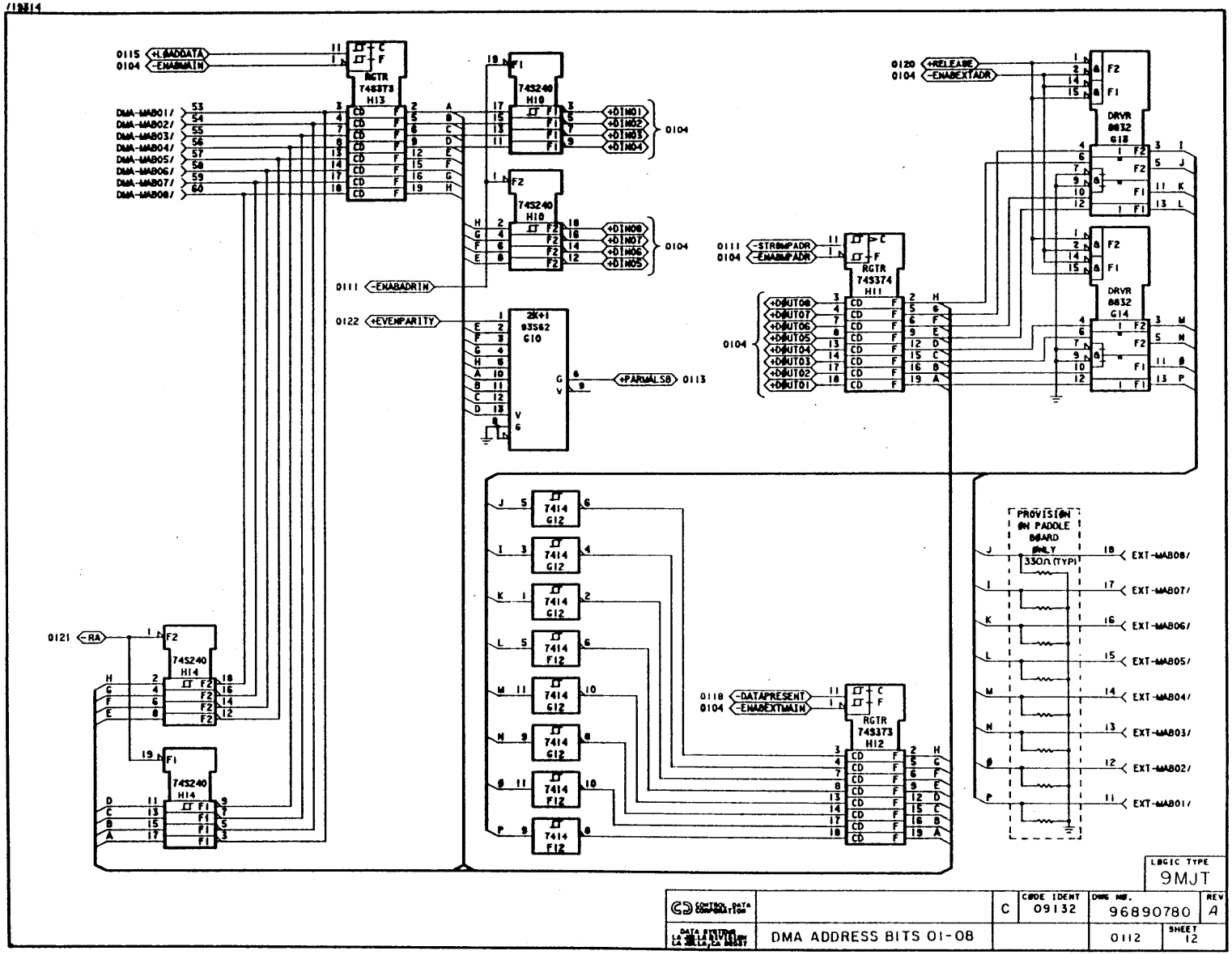


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 12 of 22)

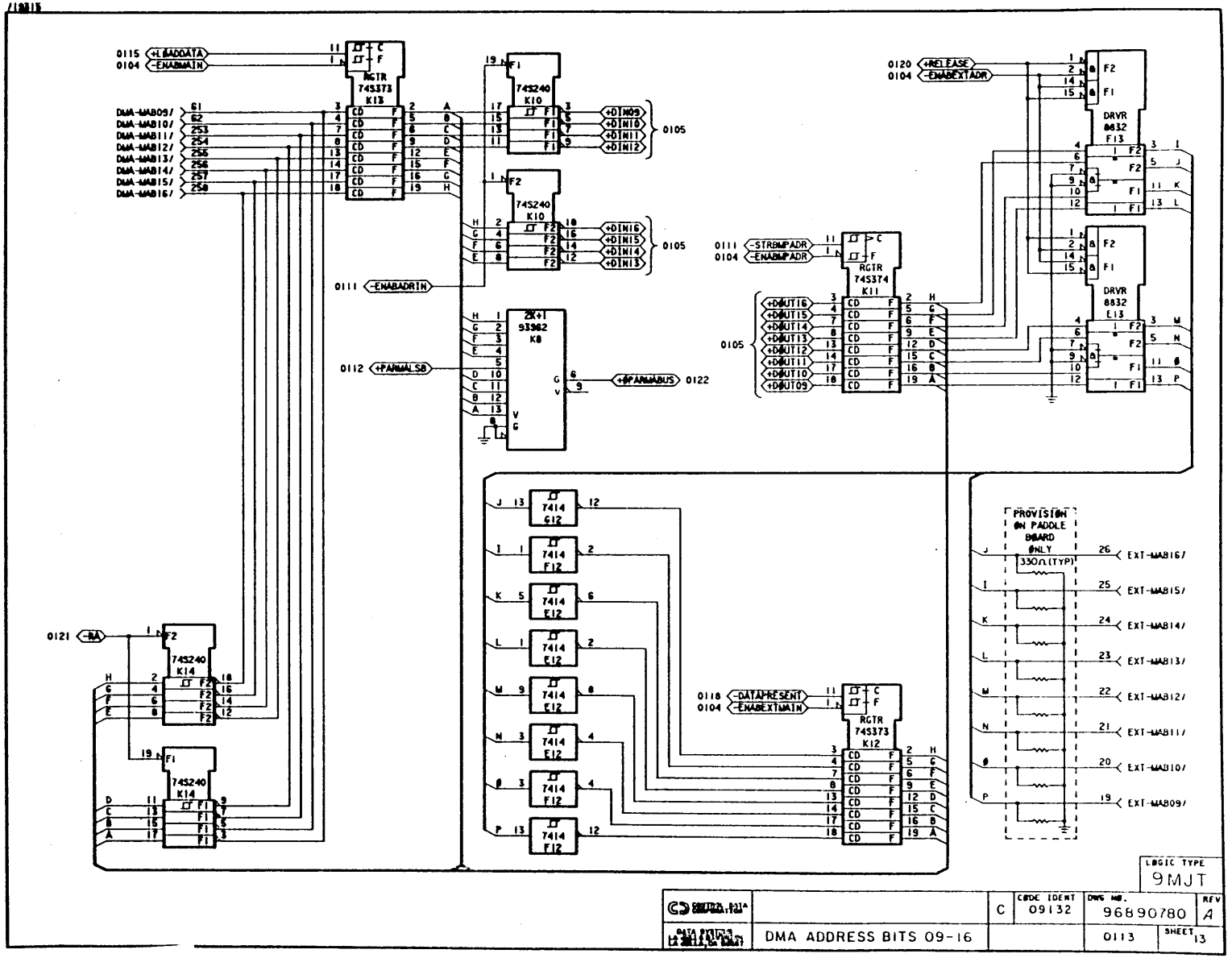


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 13 of 22)

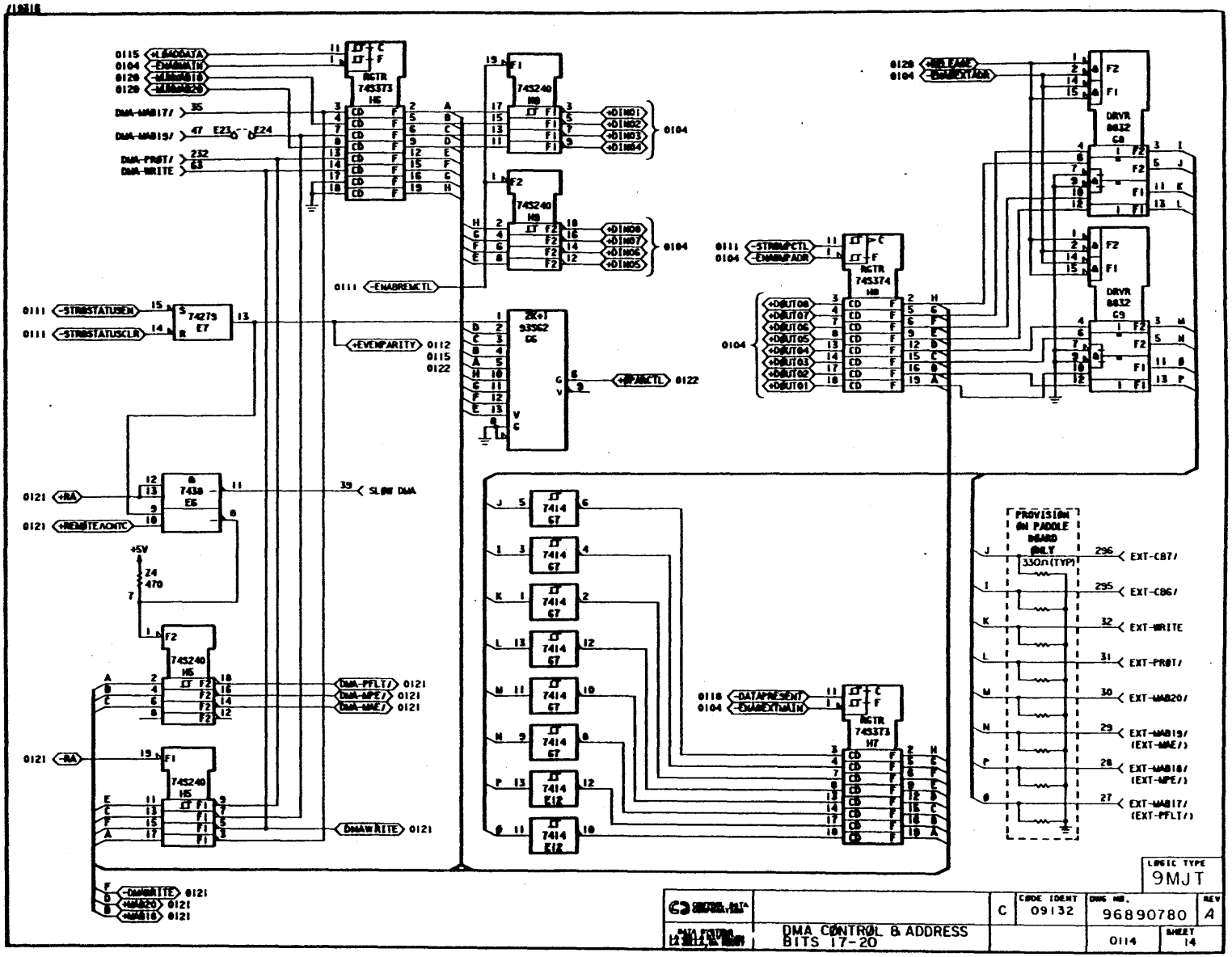


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 14 of 22)

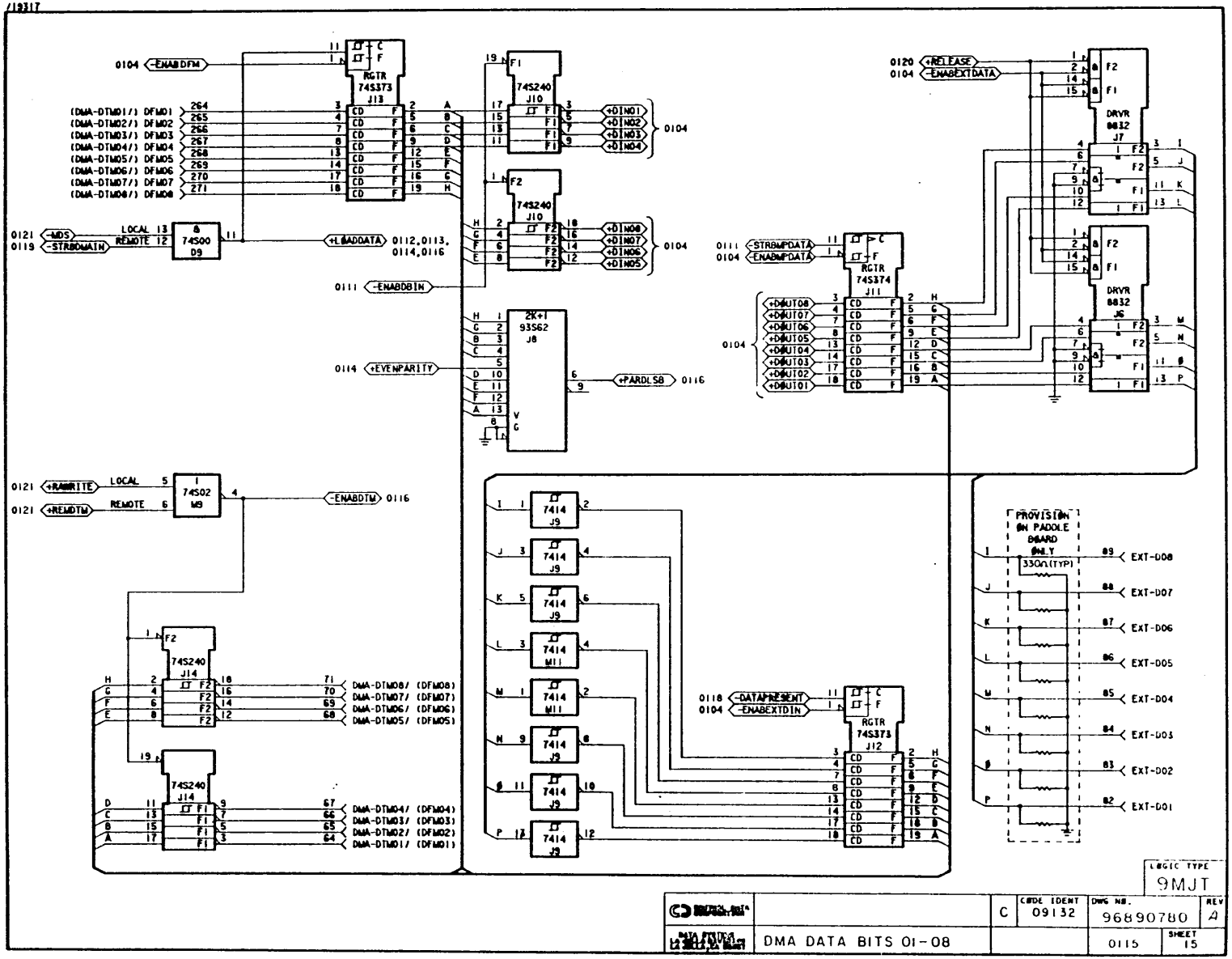


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 15 of 22)

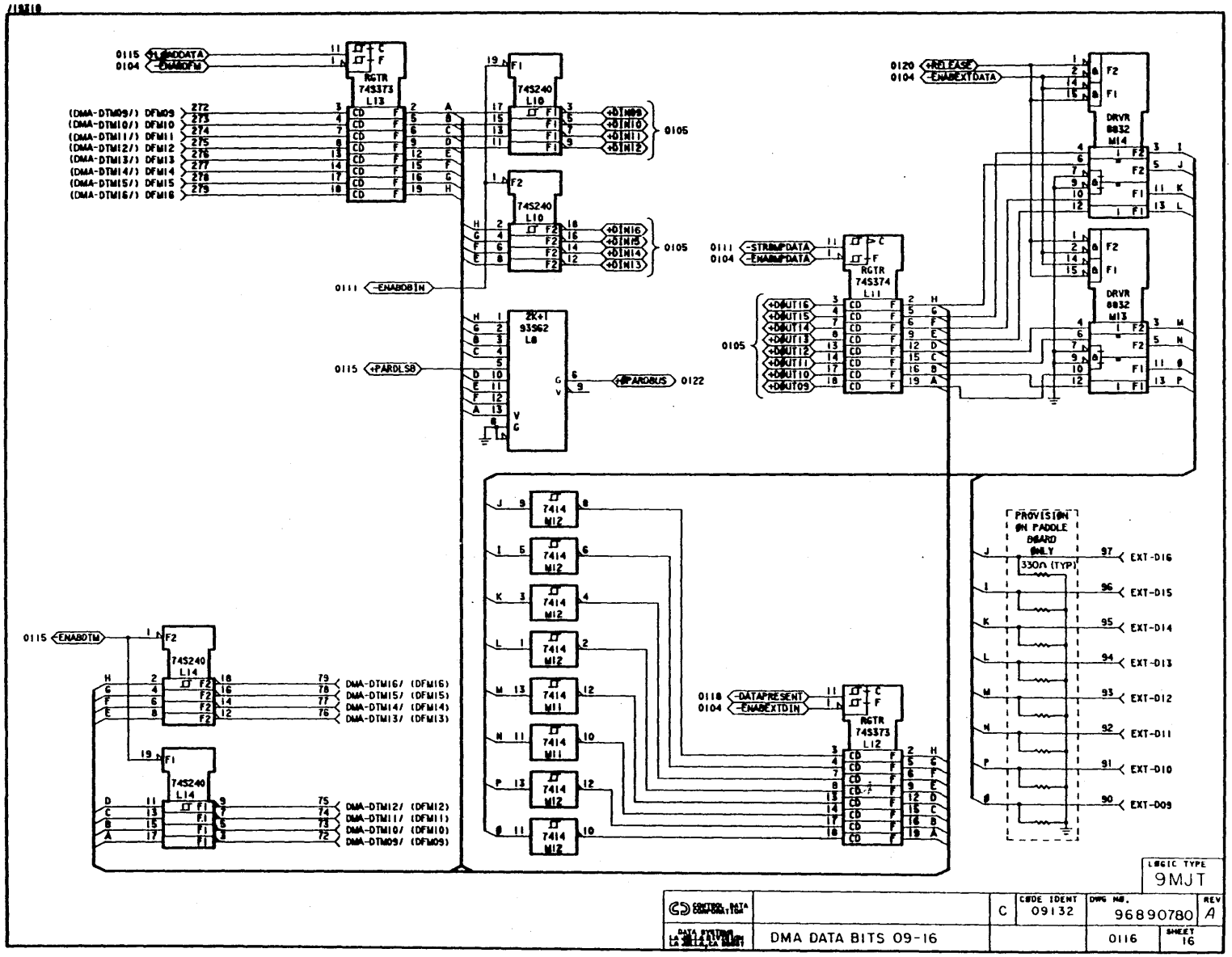


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 16 of 22)

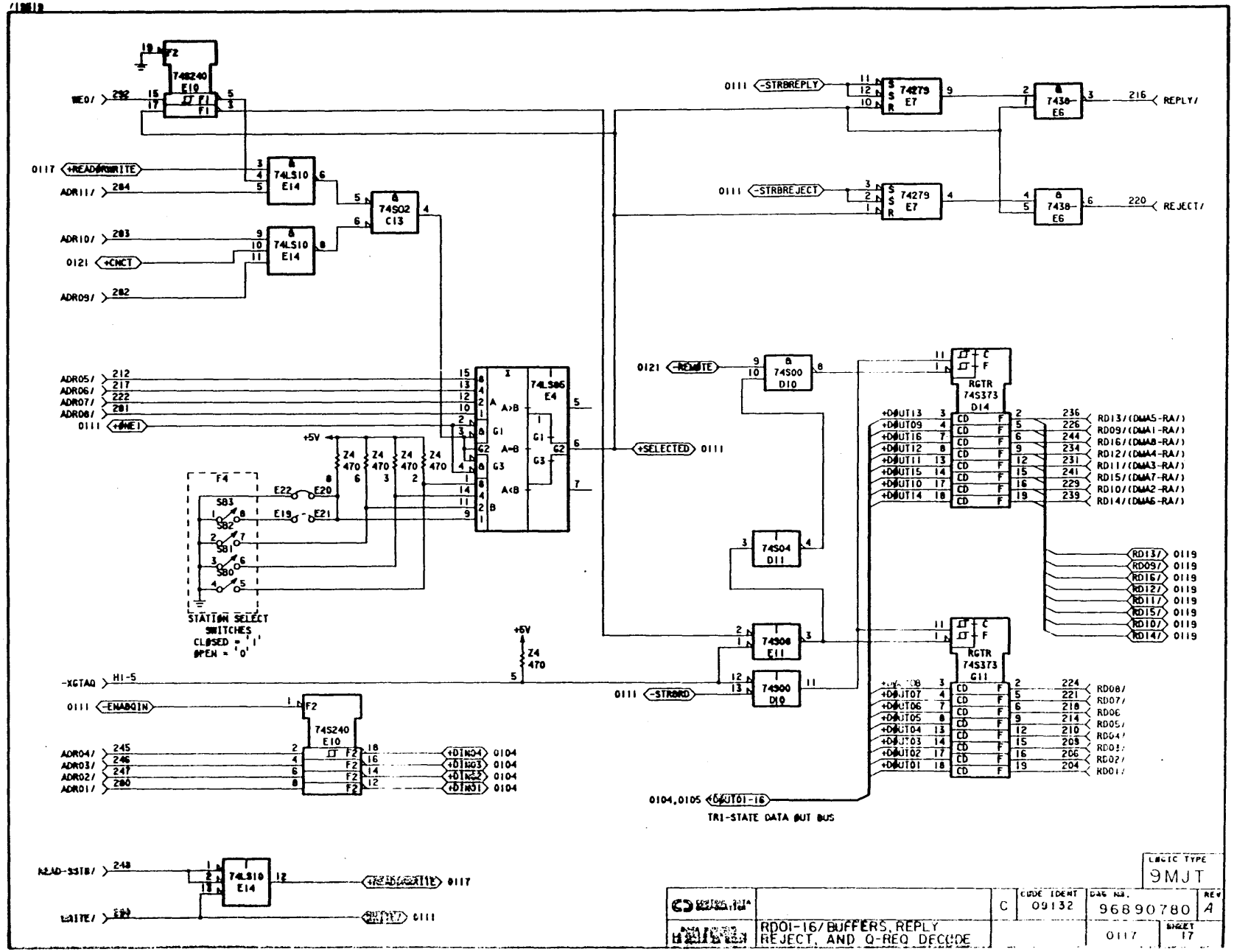


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 96411 (Sheet 17 of 22)

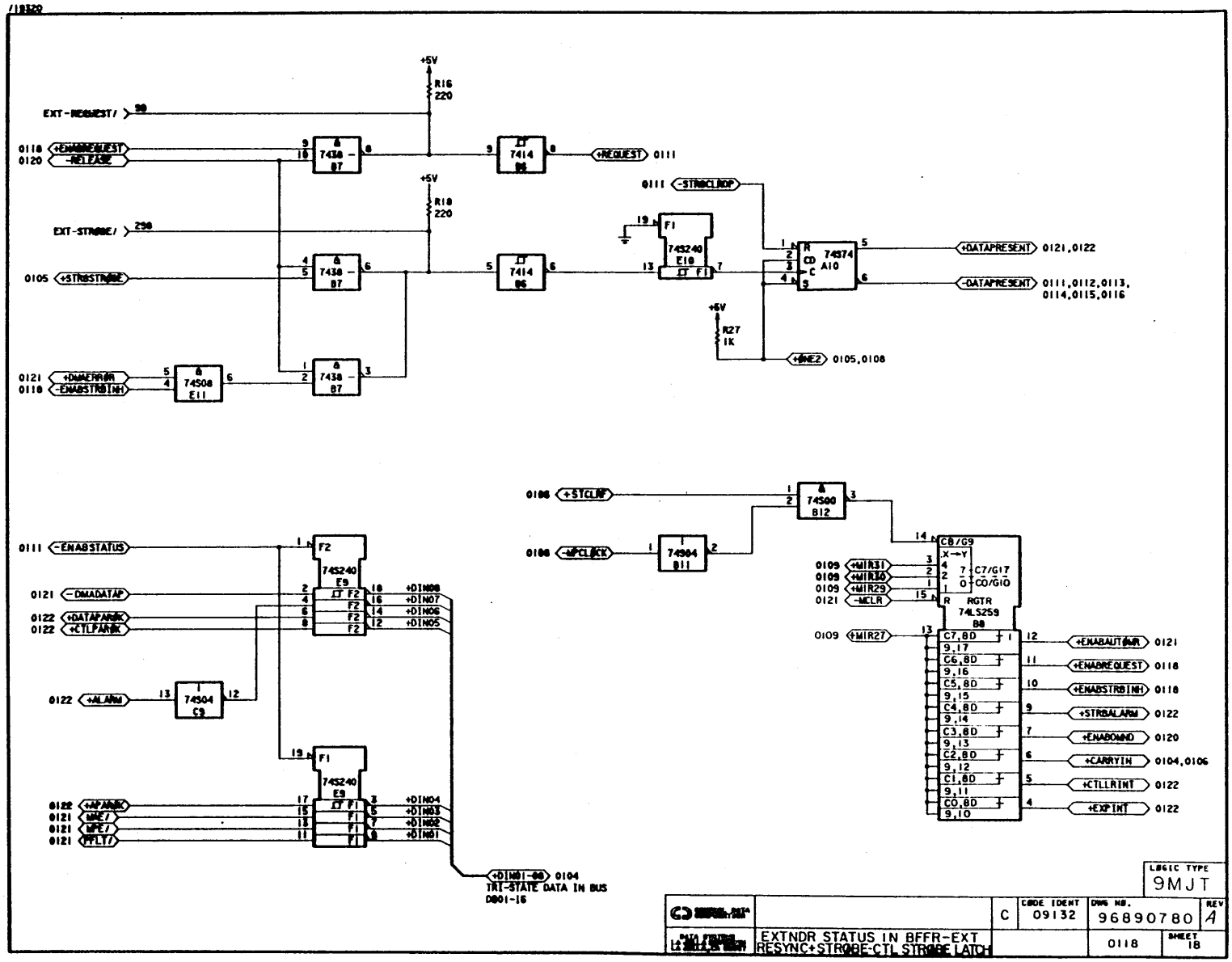


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 18 of 22)

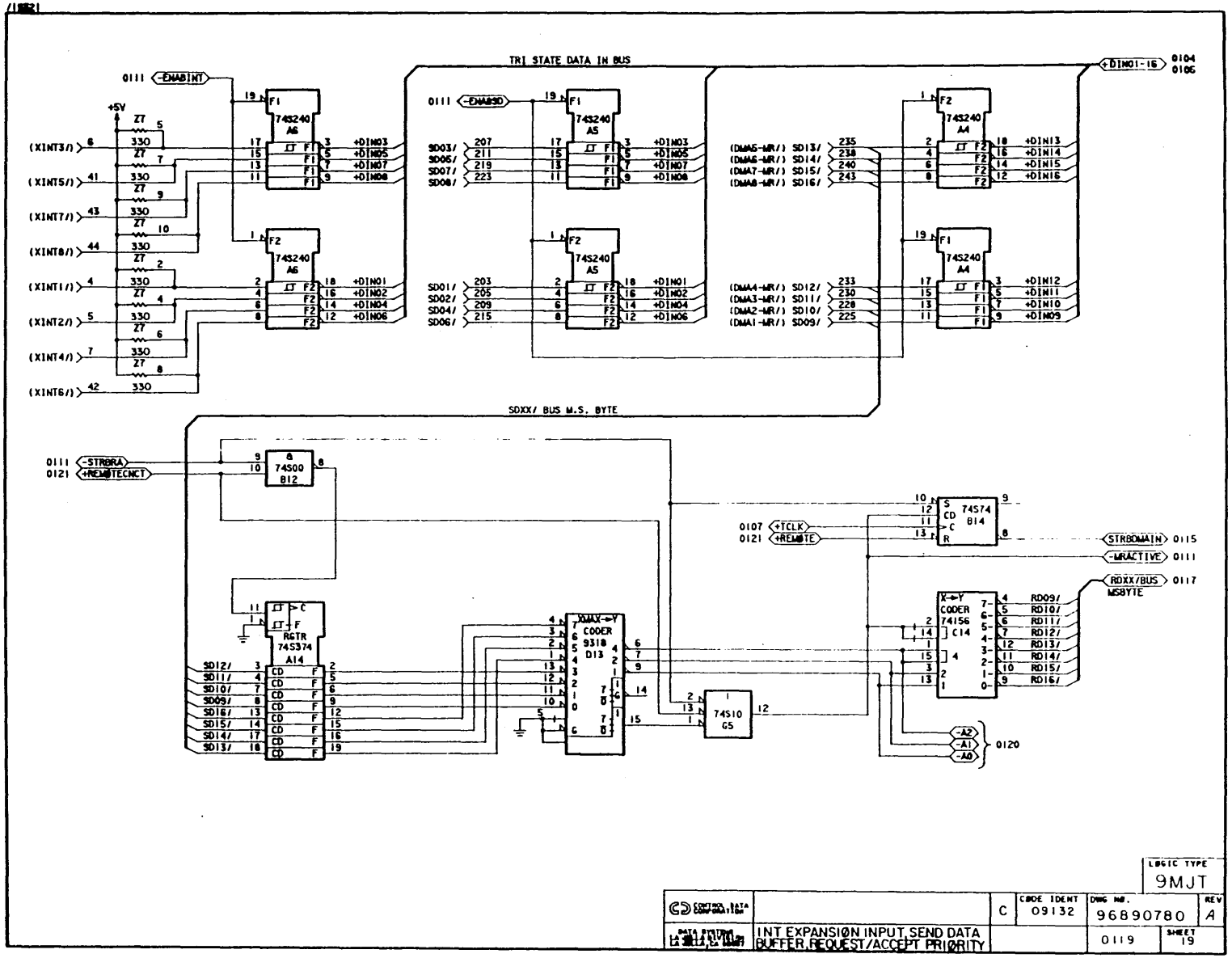


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 19 of 22)

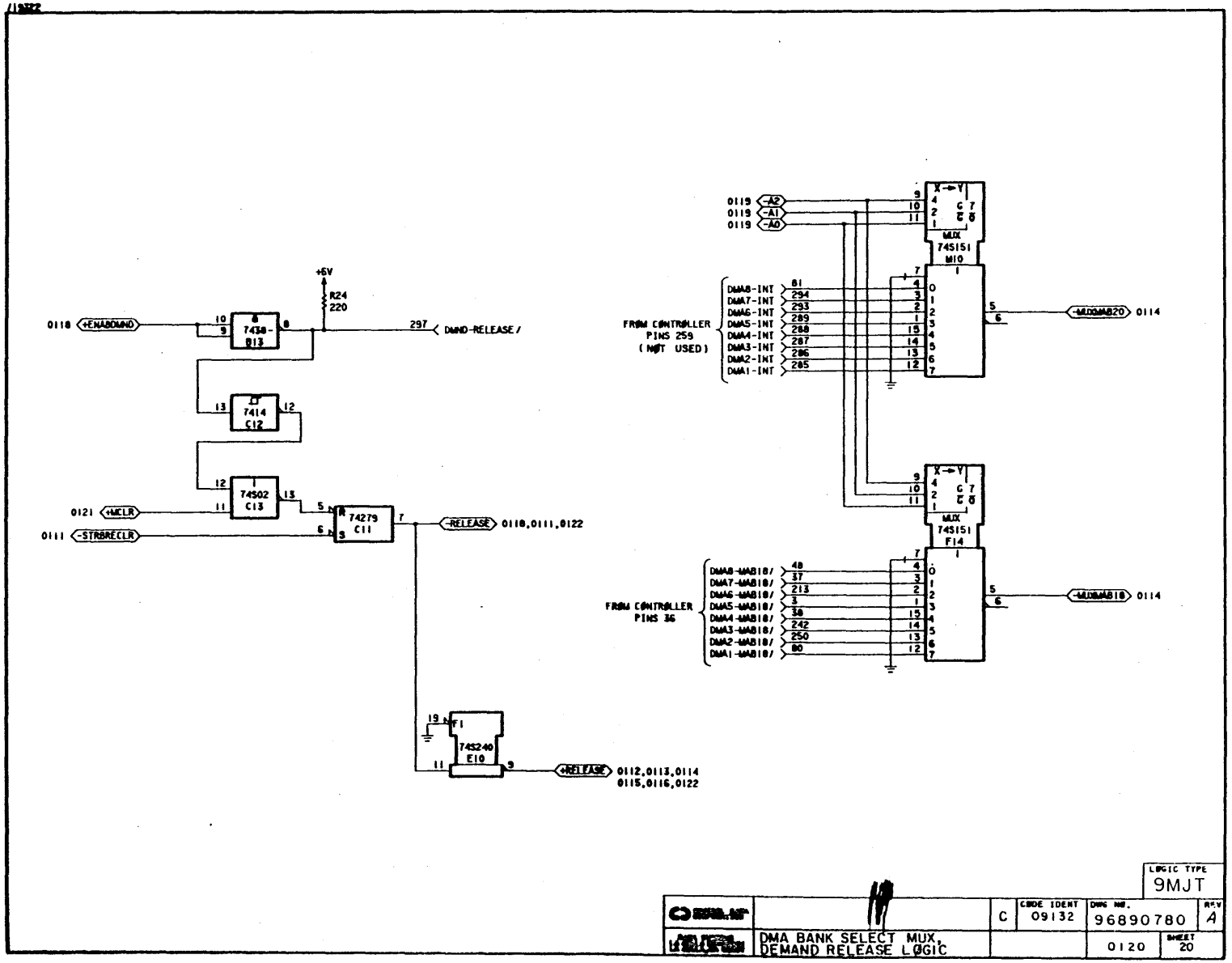


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 20 of 22)

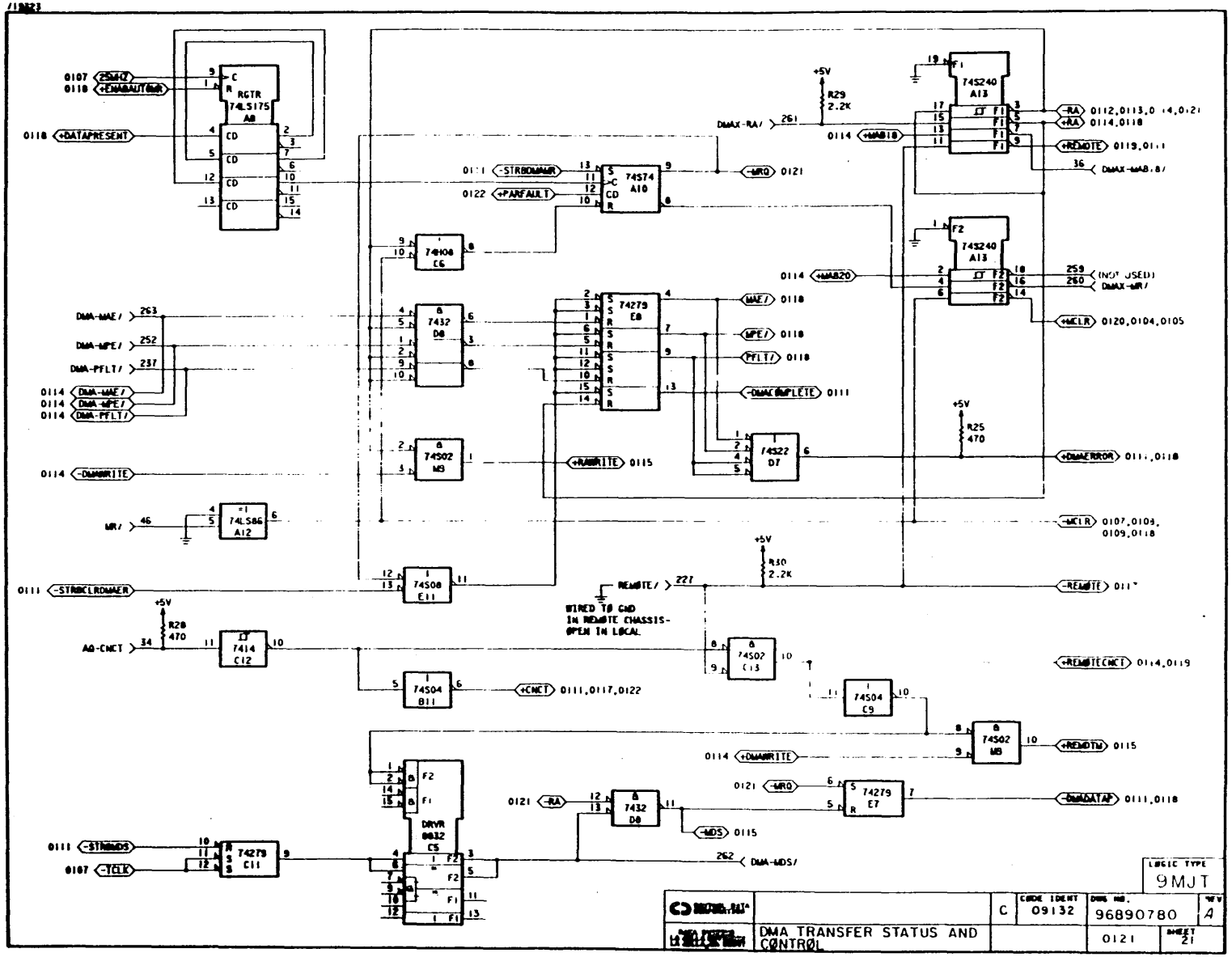


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 21 of 22)

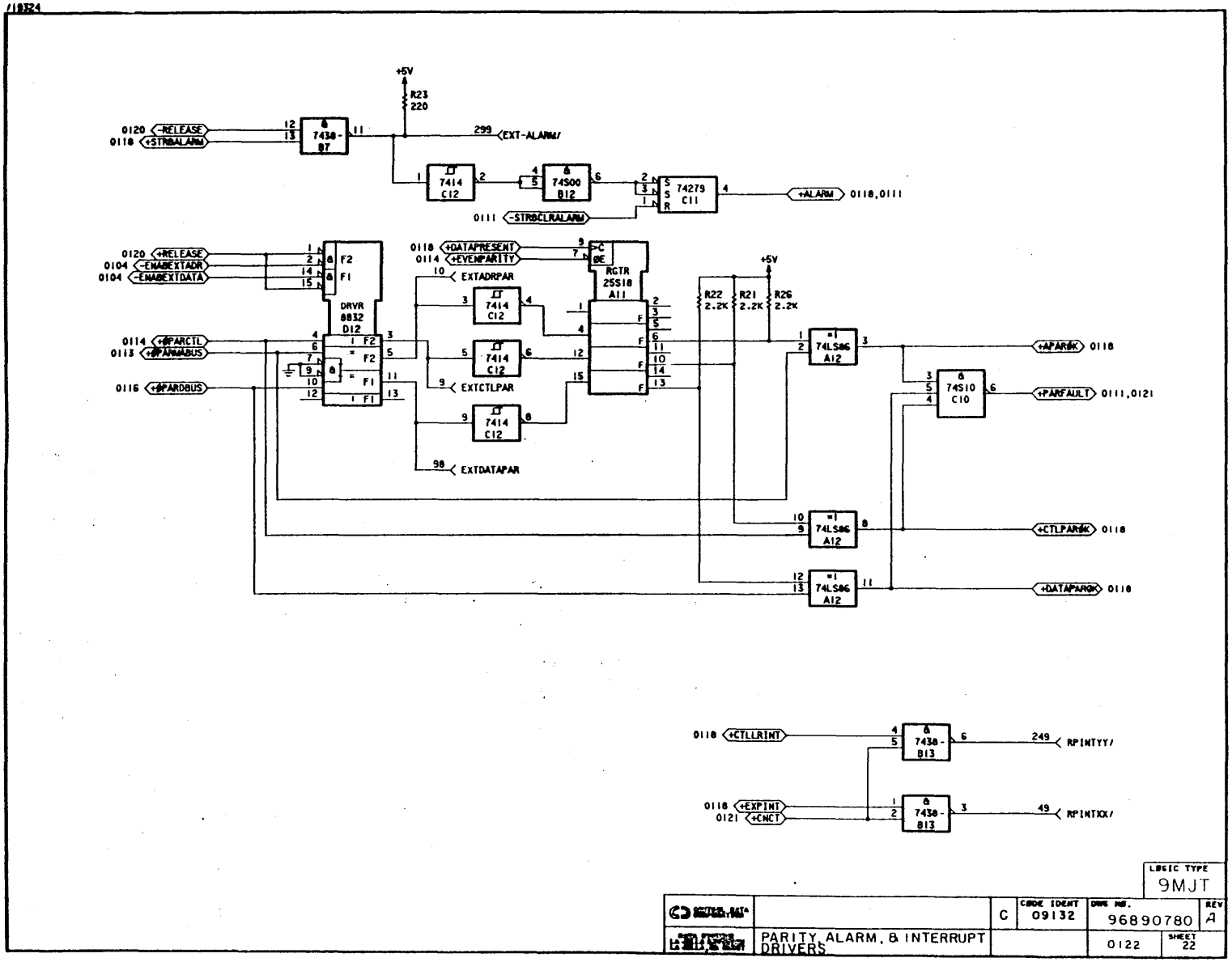


Figure 5-6. DMA Extender (DMAX) Logic Diagram, 9MJT (Sheet 22 of 22)

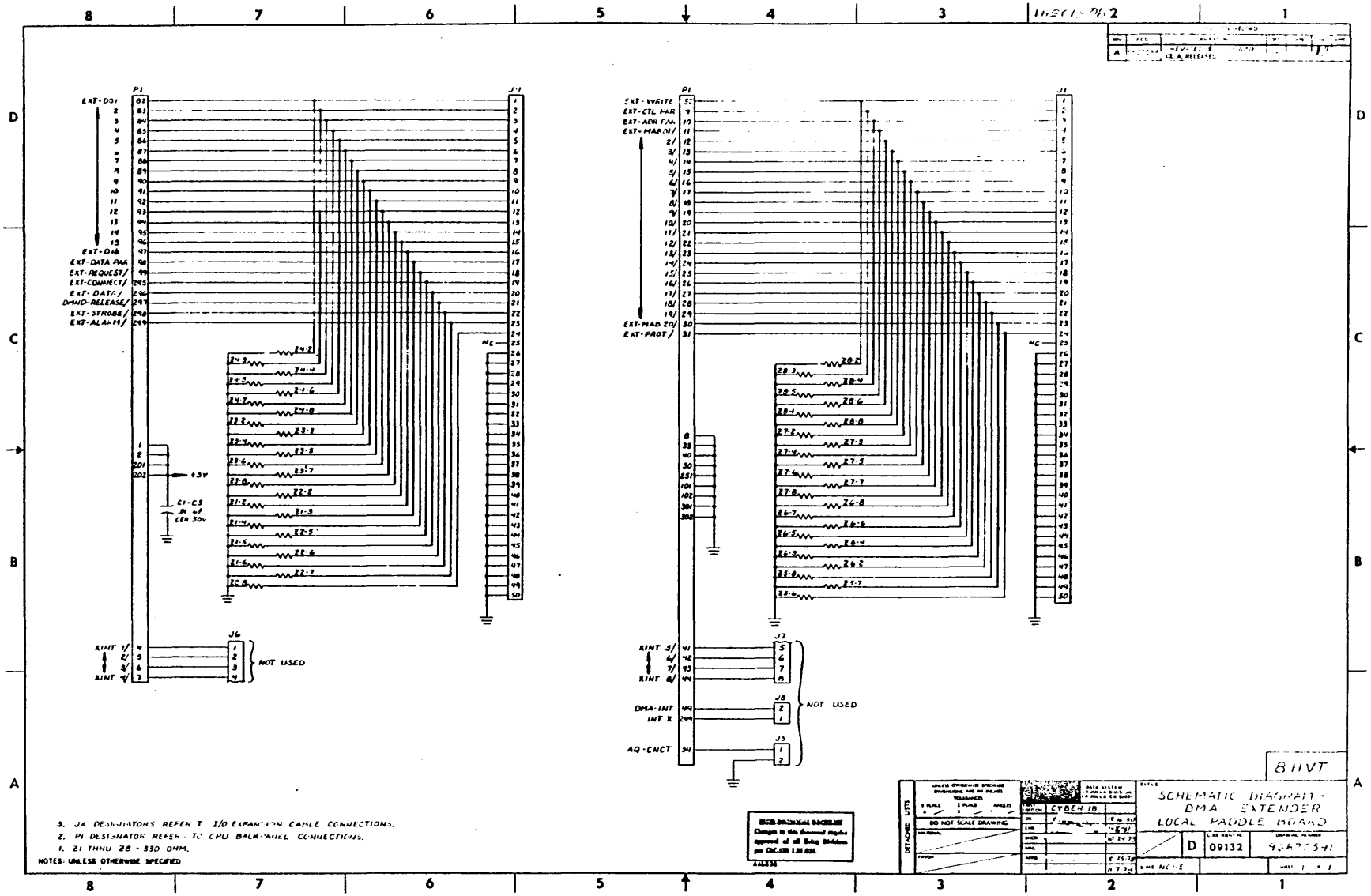


Figure 5-7. Local DMAX Paddle Board Logic Diagram, 8HVT

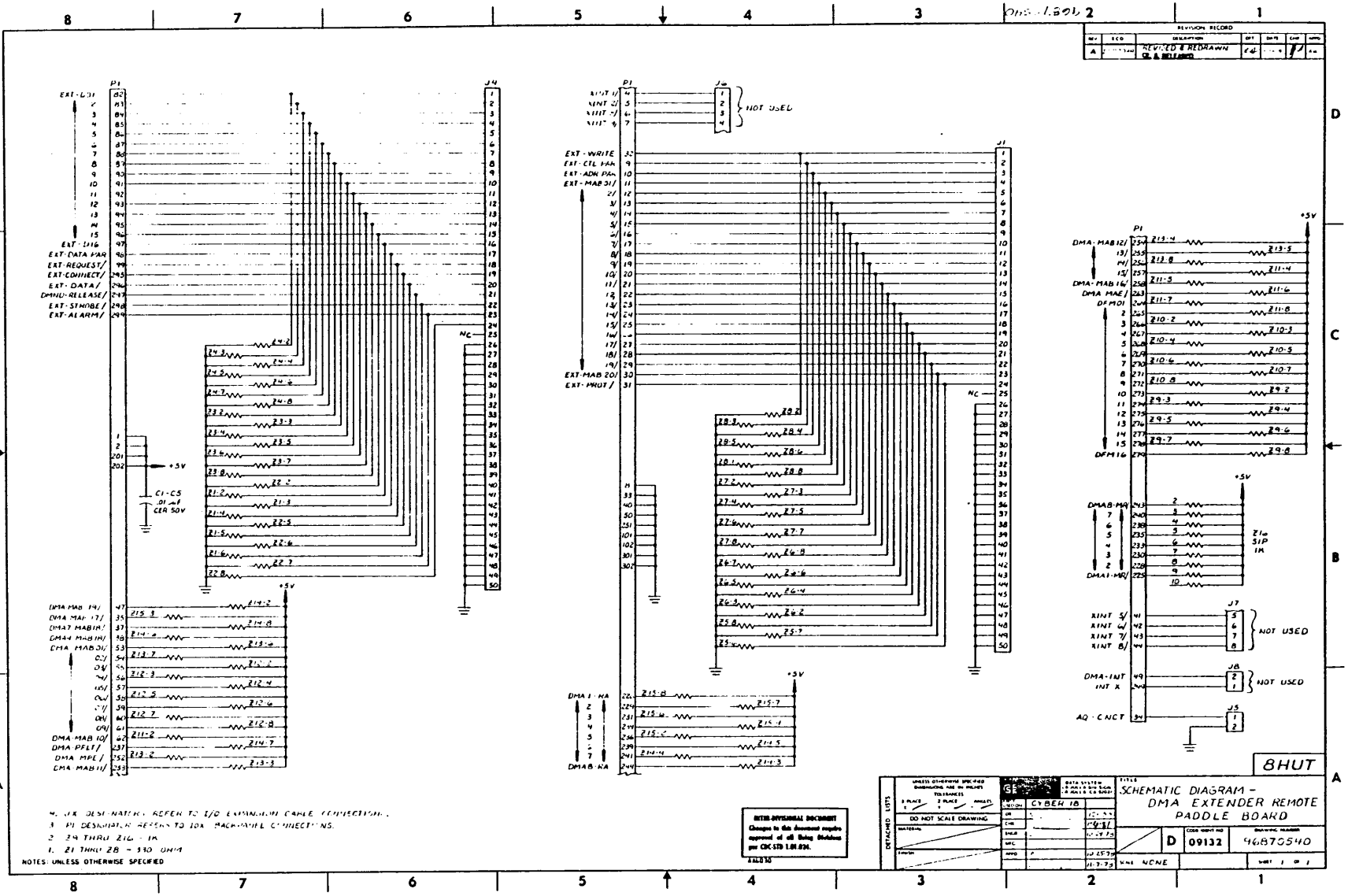


Figure 5-8. Remote DMAX Paddle Board Logic Diagram, 8HUT

MAINTENANCE 6

This section contains three basic maintenance aids: the Operational Diagnostic System (ODS), the Diagnostic Decision Logic Table (DDLT), and procedures applicable to actions required in the DDLTs.

ODS

The following are precautions and additional information that the customer engineer should remember when performing diagnostic testing:

- Place console device in scroll mode.
- Do not intermix test media (Level I and Level II software).
- Power to the peripherals should be turned off before power to the computer; and power to the peripherals should be turned on last, after power to the computer has been turned on.
- Printed wiring assemblies may be removed from, or installed in the processor with the power on, but a Master Clear should be performed first and mass memory devices should be stopped before any PWA is removed.
- None of the keys on the console display may be pressed while the diagnostic medium is being loaded.
- When the ESC key is depressed, the computer is placed in panel mode. If the ESC key is accidentally depressed, the condition can be rectified by depressing the @ key.
- The DDLTs presume that all operator inputs are entered correctly. Any incorrect entry may cause the DDLT to direct an incorrect action. If any doubt exists about the accuracy of the operator entry, always repeat the sequence of DDLT steps that led up to an action before taking further steps.
- If an erroneous test entry is made and executed during a Level I test, perform the following sequence:

  1. Master Clear
  2. ESC
  3. I @

  This sequence returns the operator to the beginning of the test.

NOTE

Do not perform this sequence during a memory test or reload test.

- For additional information regarding the use of the ODS diagnostic tests, refer to the Operational Diagnostic System (ODS) Version 2 Reference Manual.

For error code typeouts not listed in the DDLTs, refer to the following:

TYPEOUT	DESCRIPTION
GHOST INTERRUPT	Level I tests. An unexpected interrupt was received.
LINES xxxx	xxxx = A bit mask indicating which line was interrupted.

MAINTENANCE AIDS

ODS programs required to test the IOX subsystem are:

LEVEL 1

- IOX - Performs address and data loopback testing of the AQX and some testing of the DMAX hardware. No DMA transfers are made.
- ODS tests for the I/O controllers installed in the IOX subsystem.

LEVEL 2

- ODS tests for I/O controllers and peripherals connected to the IOX subsystem.

The DMAX boards contain self-test firmware with LED indicators on some versions of this board.

MAINTENANCE EQUIPMENT REQUIRED

The following standard maintenance tools are required:

- Multimeter - 0 V dc through 50 V dc, accuracy 2 percent minimum, 20 Kohm/V. 0 V ac through 250 V ac, accuracy 3 percent minimum
- Phillips-head and flat blade screwdrivers (8-inch (203-millimeter) shaft)
- Nutdrivers - 1/4 inch, 5/8 inch

If higher level maintenance support is required, the following additional maintenance tools are needed:

- Oscilloscope - Dual trace, dc to 10 MHz minimum, calibrated trigger sweep (Tektronix Model 546)

DESCRIPTION OF DIAGNOSTIC DECISION LOGIC TABLES

The DDLTs identify and isolate equipment malfunctions in the replaceable assemblies. The DDLT analyzes a situation according to specific conditions and then directs the customer engineer to those actions that correct the situation, with the most likely action listed first. The table is arranged in five sections: assumptions, conditions, responses, actions, and sequence of actions (see the DDLT example in figure 6-1).

ASSUMPTIONS

The upper section of the DDLT contains the prerequisites for the specific tests to be performed. Read the assumptions and insure that each assumption is true before proceeding with the examination of the conditions. The DDLT is valid only if all assumptions are true.

CONDITIONS

The center left section of the DDLT contains the conditions or tests to be made. They are in the form of questions that can be answered Yes or No. Read the first condition and determine if the response is YES (Y) or NO (N).

CONDITION RESPONSE

The location of the response in the response section will determine the column to be evaluated. Continue evaluation under that column (for example in column 1) until an answer to a condition causes a branch to another column, then evaluate that column (for example, column 5).

Continue this procedure until there are no further conditions under the column being evaluated, then proceed to the actions section. If there are no answers for a condition in the column being evaluated, then the condition is not applicable to the evaluation (for example, conditions 3, 4, and 5 in column 5).

ACTIONS

The lower left quadrant is a list of actions. The actions may direct you to stop, continue troubleshooting a problem, take corrective action, check parameters, or enter parameter changes. Actions are performed according to the sequence specified in the sequence of actions under the column being evaluated.

SEQUENCE OF ACTIONS

The lower right section lists the sequence of actions. These sequences are either a number, indicating a sequential order of actions to perform, or an X, for a single action to perform. These actions are performed under the column being evaluated. The action will give the intervening directions to keep troubleshooting moving logically. However, the customer engineer has some general directions that may not be included in the DDLTs. These general directions are:

- Correction Actions

  Problem Corrected - Restore system to operation.

  Problem Not Corrected - Undo attempted correction, then continue to next sequential action.

- Parameter Change Action - Make change, then continue to next sequential action.

- Check Actions

  Problem Found - Correct minor problem and follow intervening directions.

  No Problem Found - Continue to next sequential action.

DDLT EXAMPLE

The DDLT flow in cases A, B, and C through the example shown in figure 6-1 is based upon the following assumed responses to conditions 1 through 5:

CONDITION	CASE A	CASE B	CASE C
1	YES	NO	YES
2	-	YES	-
3	YES	-	YES
4	YES	-	YES
5	YES	-	NO

Case A

Observe condition 1, the response of (Y) is found in column 1. Note that condition 2 is not applicable to column 1. Therefore, observe condition 3 for response in this case. Proceed in the same manner through the remaining conditions and then execute Action 1, identified by an X under column 1, indicating no sequence other than that single action is performed.

Case B

Observe condition 1; the response of (N) is found in column 5. Proceed to condition 2 and observe under column 5 the

Power On	Sheet 1					
ASSUMPTIONS: 1. Entry is made from system initialization table. 2. Equipment power cord is connected to ac outlet. 3. Power switch is set to ON position. 4. Motor switch is set to OFF. 5. Keyboard console device is operational.						
CONDITIONS:	1	2	3	4	5	6
1. Is power indicator illuminated?	Y				N	
2. Are any indicators illuminated?					Y	N
3. Is cooling fan running?	Y			N		
4. Turn on motor. Did motor start?	Y		N			
5. Are the run parameters correct?	Y	N				
ACTIONS:						
1. Go to sheet 2 of this table.	X					
2. At keyboard enter: Run parameters for procedure Z Go to sheet 2 of this table.		X				
3. Check power toggle switch.						2
4. Check fuse at rear of cabinet and replace if defective.						1
5. Replace cooling fan assembly.				2		
6. Check 20-volt power supply and adjust to proper value.			1		2	3
7. Replace switch board and cable assembly.				1	3	4
8. Replace lamp in indicator.					1	
9. Replace power supply assembly.			3		4	5
10. Replace control board.			2	3		
11. Call next level of support.			4	4	5	6

RESPONSES

SEQUENCE OF ACTIONS

Figure 6-1. Hypothetical DDLT Example

response (Y). Note that this is the last applicable condition with actions under column 5; therefore, proceed directly to sequential action 1, column 5. Perform the corresponding action number 8. Restart the test and determine if the same problem exists; if so, continue with the next sequential action 2, which corresponds to action number 6. Continue performing sequential actions and restarting the test after each corrective action is completed until the problem is resolved or other action directed. When a problem is corrected by an action, restore the system to normal operation.

Case C

Observe condition 1; the response (Y) is found in column 1. Note that condition 2 is not applicable to column 1; therefore, proceed to condition 3 and observe (Y) in column 1. Condition 4 also appears as (Y) in column 1. However, in this case condition 5 response is (N), located under column 2. Perform action number 2, which is a single action. Note that this is a parameter change action; therefore, do not restart the test unless so directed by the action.

DIAGNOSTIC DECISION LOGIC TABLES

Tables 6-1 and 6-2 are the DDLTs for the IOX subsystem. The referenced procedures in the DDLTs immediately follow the DDLTs. Before proceeding with the DDLTs, read the user special notes below.

SPECIAL NOTES

Before using the DDLTs or associated procedures, examine the system and gain familiarity with the installed IOX subsystem hardware configuration. Using the information in sections 1 through 5 that describes the IOX subsystem, locate and identify the IOX subsystem PWAs, backplane cable adapter boards (paddle boards) and cable assemblies. Note the slot assignments of the local and remote I/O expansion PWAs.

To verify that the IOX is functioning properly, the ODS test(s) for one of the I/O controllers installed in the IOX card cage must be run in addition to the ODS IOX diagnostic. The buffered communication line adapter (BCLA) is the controller normally used for this purpose. Another controller may be used if no BCLA is available.

In dual-CPU access IOX systems, ODS can only be run on one CPU at a time.

TABLE 6-1. I/O EXPANSION LEVEL I DDLT

IOX — Sheet 1 of 9

ASSUMPTIONS:

1. The Loadcheck and Instruction DDLTs in the processor manual have been successfully completed.

2. The IOX cabinet is powered on.

3. The +5 V output of the IOX power supply is in the range of 4.95 to 5.05 V and the +12 and -12 V outputs are within the range of 11.88 to 12.12 V. If not, adjust the power supply per procedure 6 or replace the power supply per procedure 7.

4. If the IOX is configured for dual-CPU access, disconnect the cables at connectors J4 and J5 of the local AQX paddleboards on both CPUs and remove the remote AQX and DMAX PWAs that correspond to the CPU not under test.

5. Place the Normal-Test/Override switch on the local AQX PWA in the override position (up) in the CPU under test.

6. The CPU has been master cleared.

7. If DMAX (BU272) PWAs containing eight LEDs are installed, only the bottom seven LED indicators on the local DMAX PWA are illuminated and all eight of the LED indicators on the remote DMAX PWA are illuminated.

   If some other pattern is displayed, change the corresponding DMAX PWA.

8. The Level I diskette containing the IOX diagnostic has been loaded.

9. xxxxx? is displayed on the screen (where xxxxx is a test name).

   If xxxxx is not displayed, go to the Loader Fault DDLT in the processor manual.

10. The following is entered at the keyboard:

    Press: ESC
    Type: J24@IOX
    Press: CARRIAGE RETURN

    and the screen displays:

    IOX EXECUTING
    IOX SUSPENDED BOT

    If these messages are not displayed, go to the Loader Fault DDLT in the processor manual.

11. The station switches on the local AQX PWA are set per the normal definition setting listed in section 2 of this manual. For a non-standard station address, enter the following:

    Type: 7,xO where x is as defined below.
    Press: CARRIAGE RETURN

Station Address	0	1	2	3	4	5	6	7
X	8	9	A	B	C	D	E	F

12. The following is entered at the keyboard:

    Press: ESC
    Type: J22@GO
    Press: CARRIAGE RETURN

    and the screen displays:

    IOX SECTION 0001
    *** PUT NORMAL-TEST/OVERRIDE SWITCH TO NORMAL-TEST POSITION (DOWN)
    ON THE LOCAL AQ EXTENDER PWA. ENTER GO WHEN READY.
    IOX SUSPENDED SELF

    Place the Normal-Test/Override switch on the local AQX PWA in the Normal-Test position (down).

    If these messages are not displayed, go to the Loader Fault DDLT in the processor manual.

TABLE 6-1. I/O EXPANSION LEVEL I DDLT (Contd)

IOX	Sheet 1 of 9 (Contd)				
CONDITIONS:	1	2	3	4	5
1. The configuration contains an AT314-A/B/E only.	Y	N			
2. The configuration contains an AT314-C/D only.		Y	N		
3. The configuration contains an AT314-A/B/E and a BU272.			Y	N	
4. The configuration contains an AT314-C/D and a BU272.				Y	N
ACTIONS:					
1. Go to sheet 2 of this table.	X				
2. Go to sheet 3 of this table.		X			
3. Go to sheet 4 of this table.			X		
4. Go to sheet 5 of this table.				X	
5. This DDLT supports only the above configurations. Check the equipment labels installed on site and select the appropriate configuration above.					1
6. Call the next level of support.					2

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX — Sheet 2 of 9

ASSUMPTIONS:

1. Entry is made from sheet 1 of this table (configuration contains an AT314-A/B/E without a BU272).

2. The following is entered at the keyboard:

```
Type:   4,5000
Press:  CARRIAGE RETURN
Type:   GO
Press:  CARRIAGE RETURN
```

CONDITIONS:	1	2
1. Does the screen display: IOX SECTION 0002 IOX SECTION 0003 IOX SECTION 0004 IOX SECTION 0005 IOX COMPLETED 0001 PASSES *** PUT NORMAL-TEST/OVERRIDE SWITCH TO OVERRIDE POSITION (UP) ON THE LOCAL AQ EXTENDER PWA. ENTER GO WHEN READY. IOX SUSPENDED SELF	Y	N
ACTIONS:		
1. Place the Normal-Test/Override switch on the local AQX PWA in the Override position (up). Go to sheet 6 of this table.	X	
2. Go to sheet 8 of this table.		X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX	Sheet 3 of 9		
ASSUMPTIONS: 1. Entry is made from sheet 1 of this table (configuration contains an AT314-C/D without a BU272). 2. The following is entered at the keyboard: Type: 3,1230 Press: CARRIAGE RETURN Type: GO Press: CARRIAGE RETURN			
CONDITIONS:		1	2
1. Does the screen display: IOX SECTION 0002 IOX SECTION 0003 IOX COMPLETED 0001 PASSES *** PUT NORMAL-TEST/OVERRIDE SWITCH TO OVERRIDE POSITION (UP) ON THE LOCAL AQ EXTENDER PWA. ENTER GO WHEN READY. IOX SUSPENDED SELF		Y	N
ACTIONS:			
1. Place the Normal-Test/Override switch on the local AWX PWA in the Override position (up). Go to sheet 6 of this table.		X	
2. Go to sheet 8 of this table.			X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX — Sheet 4 of 9

ASSUMPTIONS:

1. Entry is made from sheet 1 of this table (configuration contains an AT314-A/B/E with a BU272).

2. The station switches on the local DMAX and remote DMAX PWAs are set per the normal definition settings listed in section 2 of this manual. If CPU 2 of a dual-CPU access IOX subsystem is being tested, the following is entered at the keyboard:

   Type: B,B0
   Press: CARRIAGE RETURN

   For non-standard station addresses, enter the following.

   For a non-standard local DMAX:

   Type: A,x0 where x is as defined below.
   Press: CARRIAGE RETURN

   For a non-standard remote DMAX:

   Type: B,x0 where x is as defined below.
   Press: CARRIAGE RETURN

Station Address	0	1	2	3	4	5	6	7
x	8	9	A	B	C	D	E	F

3. The following is entered at the keyboard:

   Type: GO
   Press: CARRIAGE RETURN

CONDITIONS:	1	2
1. Does the screen display: IOX SECTION 0002 IOX SECTION 0003 IOX SECTION 0004 IOX SECTION 0005 IOX SECTION 0006 *** PUT NORMAL-TEST/OVERRIDE SWITCH TO OVERRIDE POSITION (UP) ON THE LOCAL AQ EXTENDER PWA. ENTER GO WHEN READY. IOX SUSPENDED SELF	Y	N
ACTIONS:		
1. Place the Normal-Test/Override switch on the local AQX PWA in the Override position (up). Go to sheet 7 of this table.	X	
2. Go to sheet 8 of this table.		X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX — Sheet 5 of 9

ASSUMPTIONS:

1. Entry is made from sheet 1 of this table (configuration contains an AT314-C/D with a BU272).

2. The station switches on the local DMAX and remote DMAX PWAs are set per the normal definition settings listed in section 2 of this manual. If CPU 2 of a dual-CPU access IOX subsystem is being tested, the following is entered at the keyboard:

   Type: B,BO
   Press: CARRIAGE RETURN

   For non-standard station addresses, enter the following.

   For a non-standard local DMAX:

   Type: A,xO where x is as defined below.
   Press: CARRIAGE RETURN

   For a non-standard remote DMAX:

   Type: B,xO where x is as defined below.
   Press: CARRIAGE RETURN

Station Address	0	1	2	3	4	5	6	7
x	8	9	A	B	C	D	E	F

3. The following is entered at the keyboard:

   Type: 3,1236,7000
   Press: CARRIAGE RETURN
   Type: GO
   Press: CARRIAGE RETURN

CONDITIONS:	1	2
1. Does the screen display: IOX SECTION 0002 IOX SECTION 0003 IOX SECTION 0006 *** PUT NORMAL-TEST/OVERRIDE SWITCH TO OVERRIDE POSITION (UP) ON THE LOCAL AQ EXTENDER PWA. ENTER GO WHEN READY. IOX SUSPENDED SELF	Y	N
ACTIONS:		
1. Place the Normal-Test/Override switch on the local AQX PWA in the Override position (up). Go to sheet 7 of this table.	X	
2. Go to sheet 8 of this table.		X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX	Sheet 6 of 9		
ASSUMPTIONS: 1. Entry is made from sheet 2 or 3 of this table (configuration does not contain a BU272). 2. The following is entered at the keyboard: Type: GO Press: CARRIAGE RETURN			
CONDITIONS:		1	2
1. Does the screen display: IOX TERMINATED 0000 ERRORS		Y	N
ACTIONS:			
1. If the IOX is configured for dual-CPU access, repeat this DDLT on the untested CPU. If both CPUs have been tested, reinstall the cables and PWAs disconnected in assumption 4 of sheet 1 of this table and place the Normal-Test/Override switch on the local AQX PWA in the Normal-Test position (down) in both CPUs.		1	
2. Go to table 6-2, sheet 1 in this manual.		2	
3. Go to sheet 8 of this table.			X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX — Sheet 7 of 9

ASSUMPTIONS:

1. Entry is made from sheet 4 or 5 of this table (configuration contains a BU272).
2. The following is entered at the keyboard:

   Type: GO
   Press: CARRIAGE RETURN

CONDITIONS:	1	2
1. Does the screen display: IOX . SECTION 0007 IOX COMPLETED 0001 PASSES IOX TEST TERMINATED 0000 ERRORS	Y	N
ACTIONS:		
1. If the IOX is configured for dual-CPU access, repeat this DDLT on the untested CPU. If both CPUs have been tested, reinstall the cables and PWAs disconnected in assumption 4 of sheet 1 of this table and place the Normal-Test/Override switch on the local AQX PWA in the Normal-Test position (down) in both CPUs.	1	
2. Go to table 6-2, sheet 1 in this manual.	2	
3. Go to sheet 9 of this table.		X

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX — Sheet 8 of 9

ASSUMPTIONS:

1. Entry is made from sheet 2, 3, 4, 5, or 6 of this table (a failure has been detected while testing the AQX PWAs).
2. Observe the console display for any of the following action codes.

CONDITIONS:	1	2	3	4	5	6	7
1. Does the screen display:							
2D10 or 2D20 (Internal Reject)	Y	N					
2D11 or 2D21 (External Reject)		Y	N				
2D30 (AQX Status)			Y	N			
2D34 (Override Set)				Y	N		
2D40 or 2D41 (Echo Local)					Y	N	
2D42 or 2D43 (Echo Remote)						Y	N
ACTIONS:							
1. Verify the station switch settings on the local AQX PWA. Refer to section 3 of this manual.	1						
2. Ensure the Normal-Test/Override switch on the local AQX PWA is in the Normal-Test position (down).				1			
3. Replace the local AQX PWA (procedure 1).	2	1	1	2	1	2	
4. Replace the local AQX paddle board PWA (procedure 2).						4	
5. Replace the remote AQX PWA (procedure 3).					2	1	
6. Replace the remote AQX paddle board PWA (procedure 4).						3	
7. Replace the I/O expansion AQX cables (procedure 5).						5	
8. Restart this DDLT at sheet 1 of this table.	3	2	2	3	3	6	1
9. Call the next level of support.	4	3	3	4	4	7	2

TABLE 6-1. IOX: I/O EXPANSION LEVEL I DDLT (Contd)

IOX							Sheet 9 of 9
ASSUMPTIONS: 1. Entry is made from sheet 7 of this table (a failure has been detected while testing the DMAX PWAs). 2. Observe the console display for any of the following action codes.							
CONDITIONS:	1	2	3	4	5	6	7
1. Does the screen display:							
2D10 or 2D20 (Internal Reject)	Y	N					
2D11 or 2D21 (External Reject)		Y	N				
2D22 (No Reject)			Y	N			
2D31 (Remote DMAX Status)				Y	N		
2D32 (Local DMAX Status)					Y	N	
2D33 (Override Not Set)						Y	N
ACTIONS:							
1. Verify the station switch settings on the local and remote DMAX PWAs. Refer to section 2 of this manual.	1	1					
2. Ensure the Normal-Test/Override switch on the local AQX PWA is in the Override position (up).						1	
3. Replace the local DMAX PWA (procedure 1).	2	2	1	3	1		
4. Replace the remote DMAX PWA (procedure 3).	3	3	2	1	2		
5. Replace the local AQX PWA (procedure 1).	5					2	
6. Replace the local AQX paddle board PWA (procedure 2).	7						
7. Replace the remote AQX PWA (procedure 3).	4	4	3	2			
8. Replace the remote AQX paddle board PWA (procedure 4).	6						
9. Replace the I/O expansion AQX cables (procedure 5).	8						
10. Restart this DDLT at sheet 1 of this table.	9	5	4	4	3	3	1
11. Call the next level of support.	10	6	5	5	4	4	2

TABLE 6-2. IOX: I/O PERIPHERAL TEST DDLT

IOX Peripheral Test	Sheet 1 of 2	
ASSUMPTIONS: 1. Entry is made from table 6-1 of this manual (the IOX Level I DDLT has been successfully executed). 2. An I/O subsystem connected to the IOX chassis is not functioning properly.		
CONDITIONS:	1	2
1. Has the DDLT for the failing I/O subsystem been successfully executed with the controller installed in the CPU card cage?	Y	N
ACTIONS:		
1. Go to sheet 2 of this table.	X	
2. Execute the DDLT for the failing I/O subsystem with the controller installed in the CPU card cage. When successful, reinstall the controller into the IOX card cage and execute the DDLT for the I/O subsystem again. If an error is detected, go to sheet 2 of this table.		X

TABLE 6-2. IOX: I/O PERIPHERAL TEST DDLT (Contd)

IOX Peripheral Test					Sheet 2 of 2
ASSUMPTIONS: 1. Entry is made from sheet 1 of this table (an I/O subsystem connected to the IOX chassis is not functioning properly) or a failing I/O subsystem DDLT.					
CONDITIONS:	1	2	3	4
1. Is it suspected that the error detected by the failing I/O subsystem DDLT is due to:				
a. An AQ failure	Y	N		
b. A DMA failure		Y	N	
c. An interrupt failure			Y	N
ACTIONS: NOTE For actions 1 through 10, execute the Level I DDLT (table 6-1), then the failing I/O subsystem DDLT, prior to trying the next action.				
1. Replace the local AQX PWA (procedure 1).	2	3	3	
2. Replace the local AQX paddle board PWA (procedure 2).	4	9	5	
3. Replace the remote AQX PWA (procedure 3).	1	4	2	
4. Replace the remote AQX paddle board PWA (procedure 4).	3	8	4	
5. Replace the I/O expansion AQX cables (procedure 5).	5	10	6	
6. Replace the local DMAX PWA (procedure 1).		1		
7. Replace the local DMAX paddle board PWA (procedure 2).		6		
8. Replace the remote DMAX PWA (procedure 3).		2		
9. Replace the remote DMAX paddle board PWA (procedure 4).		5		
10. Replace the I/O expansion DMAX cables (procedure 5).		7		
11. Verify that the IOX interrupt and the CPU interrupt wires are properly connected to the failing I/O subsystem controller. Refer to section 3 of this manual.			1	
12. Restart this DDLT at sheet 1 of this table.	6	11	7	
13. Call the next level of support.	7	12	8	X

PROCEDURES

1 LOCAL IOX PWA REPLACEMENT

1. Remove the right side panel on the processor cabinet.
2. Remove the cover of the CPU card cage by rotating the two captive fasteners one-quarter turn counterclockwise.
3. Locate the IOX PWA to be replaced.
4. Using the card extractor tool attached to the card cage cover, unplug the PWA and slide it out of the card cage.
5. Before installing the new PWA, verify that all jumpers and switches correspond to the settings defined in section 2 of this manual.
6. Slide the new PWA into the card cage slot with the component side facing to the left. Seat the PWA into its connector by applying firm thumb pressure at the upper and lower corners of the PWA.
7. Replace the card cage cover and install the side panel on the processor cabinet.

2 LOCAL IOX PADDLE BOARD PWA REPLACEMENT

1. Power-off the processor cabinet at the front panel power switch.
2. Remove the left side panel and the rear panel on the processor cabinet.
3. Locate the IOX paddle board to be replaced.
4. Note the location and orientation of the connector for each cable attached to the paddle board.
5. Disconnect all of the cables attached to the paddle board.
6. Grasping the corners of the paddle board, pull straight back to separate it from the backplane pins.

Caution

All paddle boards must be installed with care as a single misaligned pin may cause irreparable damage to the paddle board, or backpanel, or both.

7. Before installing the new paddle board, inspect the backplane pins and paddle board connectors to ensure that no defects exist.
8. With the component side facing to the left position the paddle board connector over the backplane pins (1 through 102 and 201 through 302). Apply firm pressure to the upper and lower corners to fully seat the paddle board.
9. Attach the cables disconnected in step 5 to the paddle board.
10. Replace the processor cabinet panels.
11. Power-on the processor cabinet.

3 REMOTE IOX PWA REPLACEMENT

1. Open the front door of the IOX cabinet.
2. Remove the cover of the IOX card cage by rotating the two captive fasteners one-quarter turn counterclockwise.
3. Locate the IOX PWA to be replaced.
4. Using the card extractor tool attached to the card cage cover, unplug the PWA and slide it out of the card cage.
5. Before installing the new PWA, verify that all jumpers and switches correspond to the settings defined in section 2 of this manual.
6. Slide the new PWA into the card cage slot with the component side facing to the left. Seat the PWA into its connector by applying firm thumb pressure at the upper and lower corners of the PWA.
7. Replace the card cage cover.

4 REMOTE IOX PADDLE BOARD PWA REPLACEMENT

1. Open the rear door of the IOX cabinet.
2. Power-off the IOX cabinet at the power distribution box power switch.
3. Locate the IOX paddle board to be replaced.
4. Note the location and orientation of the connector for each cable attached to the paddle board.
5. Disconnect all of the cables attached to the paddle board.
6. Grasping the corners of the paddle board, pull straight back to separate it from the backplane pins.

Caution

All paddle boards must be installed with care as a single misaligned pin may cause irreparable damage to the paddle board, or backpanel, or both.

7. Before installing the new paddle board, inspect the backplane pins and paddle-board connectors to ensure that no defects exist.
8. With the conponent side facing to the left position the paddle-board connector over the backplane pins (1 through 102 and 201 through 302). Apply firm pressure to the upper and lower corners to fully seat the paddle board.
9. Attach the cables disconnected in step 5 to the paddle board.
10. Power-on the IOX cabinet.

5 IOX CABLE REPLACEMENT

1. Open the rear door of the IOX cabinet.
2. Power-off the IOX cabinet at the power distribution box power switch.

3. Power-off the processor cabinet at the front panel power switch.

4. Remove the left side panel and the rear panel on the processor cabinet.

5. Locate the processor cabinet end of the IOX cables to be replaced.

6. Note the location and orientation of the connector for each cable where it attaches to the local paddle board.

7. Disconnect the cables from the local paddle board.

8. Remove the U-bolts securing the IOX cables to the processor cabinet cable entry.

9. Locate the IOX cabinet end of the IOX cables to be replaced and note the location and orientation of each connector where it attaches to the remote paddle board.

10. Disconnect the cables from the remote paddle board.

11. Remove the U-bolts securing the IOX cables to the IOX cabinet cable entry.

12. Remove the cables from both the processor and IOX cabinets.

13. Before installing the new cables, label them as described in section 3 of this manual.

14. Install the new cables through the cable entries of the processor and IOX cabinets and connect them to the paddle boards as noted in steps 6 and 9.

15. Secure the cables' braided shield sections to the cable entries using U-bolts.

16. Replace the processor panels.

17. Power-on the processor cabinet.

18. Power-on the IOX cabinet.

6 IOX POWER SUPPLY VOLTAGE ADJUSTMENT

1. Open the rear door of the IOX cabinet.

2. Ensure that the IOX power cord is plugged into an ac outlet.

3. Power-on the IOX power distribution box circuit breaker and power switch.

4. Using the multimeter set to an ac range capable of measuring 130 volts, measure the voltage across the power supply input terminals labeled AC and ACC (figure 3-4).

   If the voltage measured is outside the range of 104 to 128 volts, determine the reason that the voltage is outside this range and correct the problem.

5. Using a multimeter set to dc range capable of measuring 15 volts, measure the voltage between the ground terminal lug and the +5, -12, and +12 volt lugs on the IOX backplane (figure 3-4).

6. If the 5 volt lug measures outside the range of 4.95 to 5.05 volts or the 12 volt lugs measure outside the range of 11.88 to 12.12 volts, adjust the associated potentiometer on the power supply to bring the voltages within the above ranges (figure 3-4).

   If the power supply outputs cannot be adjusted within the above ranges, change the power supply (procedure 7).

7 IOX POWER SUPPLY REPLACEMENT

1. Open the rear door of the IOX cabinet.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Ensure that the IOX power cord is not plugged into an ac outlet.

4. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across the power supply input terminals labeled AC and ACC (figure 3-4).

   NOTE

   The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

5. Remove the plastic shield (terminal strip cover) from the power supply.

6. Identify and remove all external wires connected to the power supply.

7. Remove the five support bracket mounting bolts along the bottom and rear edges of the bracket, and remove the power supply with its support bracket from the cabinet.

8. Remove the four screws on the back side of the support bracket to change the power supply.

9. Transfer the two wires connected from TB2-3 to -V1 and TB2-5 to TB2-7 on the old power supply to the new power supply.

10. Mount the new power supply to the support bracket.

11. Mount the support bracket with the power supply into the cabinet.

12. Reconnect the external wires to the power supply.

13. Install the plastic shield onto the power supply.

14. Adjust the power supply per procedure 6.

8 IOX CARD CAGE FANS CHECK

1. Ensure that the IOX power cord is plugged into an ac outlet.

2. Open the rear door of the IOX cabinet.

3. Power-on the IOX power distribution box circuit breaker and power switch.

4. Open the front door of the IOX cabinet.

5. Ensure that each fan power cord is securely connected to the fan and to the other fan power cords.

6. Look at the bottom side of the fans to see if the blades are rotating.

7. Change any fan whose blades are not rotating per procedure 9.

9 IOX CARD CAGE FAN REPLACEMENT

1. Open the rear door of the IOX cabinat.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Open the front door of the IOX cabinet.

4. Remove the two mounting screws, fan grill, and washers from the fan to be replaced.

5. Remove the power cord from the old fan.

6. Connect the power cord to the new fan.

7. Orient the new fan so that its air flow direction is upward.

8. Install the screws, fan grill, and washers on the new fan and fasten the assembly to the card cage chassis.

9. Check the operation of the fan per procedure 8.

10 POWER DISTRIBUTION BOX COMPONENTS CHECK

1. Open the rear door of the IOX cabinet.

2. Remove the power distribution box cover.

3. Ensure that the IOX power cord is plugged into an ac outlet.

4. Power-on the IOX power distribution box circuit breaker.

5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5). The voltage should be in the range of 104 to 128 volts. If not, determine the reason that the voltage is outside this range and correct the problem.

6. Measure the voltage across output terminals 3 and 4 of the line filter (figure 3-5). The voltage should be essentially the same as that read in step 5. If not, determine the reason and, if necessary, change the line filter per procedure 12.

7. With the power switch OFF (circuit breaker still on), measure the voltage across terminals 13 and 15 on the ac power-up control PWA.

   a. If the meter reads approximately 120 volts, the triac and ac power-up control PWA are operating correctly.

   b. If the meter reads between 70 and 100 volts, change the ac power-up control PWA (procedure 16).

   c. If the meter reads approximately 0 volts, change the triac assembly (procedure 15).

8. With the power switch ON, measure the voltage across terminals 13 and 15 on the ac power-up control PWA.

   a. If the meter reads approximately 0 volts, the triac and ac power-up control PWA are operating correctly.

   b. If the meter reads between 70 and 100 volts, change the ac power-up control PWA (procedure 16).

   c. If the meter reads approximately 120 volts, change the triac assembly (procedure 15).

9. Replace the power distribution box cover.

11 POWER DISTRIBUTION BOX CIRCUIT BREAKER CHECK/REPLACEMENT

1. Open the rear door of the IOX cabinet.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Disconnect the IOX power cord from its ac outlet.

4. Remove the power distribution box cover.

5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Remove the circuit breaker by removing the two mounting screws and pulling it out from inside the power distribution box.

7. Identify and remove the two wires from the circuit breaker.

8. Using an ohmmeter, check for continuity across the circuit breaker terminals with the breaker off, then on. If no difference is noted on the ohmmeter, change the circuit breaker. Test the new circuit breaker in the same way.

9. Reconnect the wires to the circuit breaker.

10. Install the circuit breaker with the same orientation as before and replace the mounting screws.

11. Perform procedure 10.

12 POWER DISTRIBUTION BOX LINE FILTER REPLACEMENT

1. Open the rear door of the IOX cabinet.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Disconnect the IOX power cord from its ac outlet.

4. Remove the power distribution box cover.

5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Identify and remove the five wires from the line filter.

7. Remove the four mounting screws and remove the line filter from the power distribution box.

8. Install the new line filter with the same orientation as the old line filter and reconnect the wires.

9. Perform procedure 10.

13 POWER DISTRIBUTION BOX SWITCH CHECK/ REPLACEMENT

1. Open the rear door of the IOX cabinet.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Disconnect the IOX power cord from its ac outlet.

4. Remove the power distribution box cover.

5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Identify and remove the wires from the switch.

7. Using an ohmmeter, check for continuity across the switch terminals with the switch off, then on. If no difference is noted on the ohmmeter, change the switch as follows:

   a. Remove the mounting nut on the bushing of the switch and pull the switch out from inside the power distribution box.

   b. Test the new switch as described above.

   c. Install the new switch with the same orientation as the old switch and replace the mounting nut.

8. Reconnect the wires to the switch.

9. Perform procedure 10.

14 POWER DISTRIBUTION BOX RESISTOR ASSEMBLY REPLACEMENT

1. Open the rear door of the IOX cabinet.

2. Power-off the IOX power distribution box power switch and circuit breaker.

3. Disconnect the IOX power cord from its ac outlet.

4. Remove the power distribution box cover.

5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Identify and remove the two wires from the resistor assembly to the ac power-up control PWA.

7. Remove the two mounting screws and the resistor assembly.

8. Install a new resistor assembly and reconnect the wires.

9. Perform procedure 10.

15 POWER DISTRIBUTION BOX TRIAC ASSEMBLY REPLACEMENT

1. Open the rear door of the IOX cabinet.
2. Power-off the IOX power distribution box power switch and circuit breaker.
3. Disconnect the IOX power cord from its ac outlet.
4. Remove the power distribution box cover.
5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Identify and remove the three wires from the triac assembly to the ac power-up control PWA.
7. Using an open-end wrench, carefully unscrew the triac assembly from its heat sink.
8. Install the new triac in the heat sink and reconnect the triac wires.
9. Perform procedure 10.

16 POWER DISTRIBUTION BOX AC POWER-UP CONTROL PWA REPLACEMENT

1. Open the rear door of the IOX cabinet.
2. Power-off the IOX power distribution box power switch and circuit breaker.
3. Disconnect the IOX power cord from its ac outlet.
4. Remove the power distribution box cover.
5. Using a multimeter set to an ac range capable of measuring 130 volts, measure the voltage across terminals 1 and 2 of TB01 (figure 3-5).

NOTE

The meter should read 0 voltage. If it does not, unplug the IOX power cord from its ac outlet and repeat this step until 0 voltage is read.

6. Identify and remove the wires from the ac power-up control PWA.
7. Remove the four mounting screws and the PWA from the power distribution box.
8. Install the new PWA with the same orientation as the old PWA and reconnect the wires.
9. Perform procedure 10.

PARTS DATA 7

This section contains the parts data drawings for the I/O expansion subsystem. Table 7-1 provides an index of drawings applicable to IOX subsystem.

TABLE 7-1. IOX SUBSYSTEM PARTS DATA DRAWINGS

Equipment	Part Number	Description	Page
AT314-A	88929700	PWA - AQX, 5WAT	†
	88902200	Cable - I/O, 5 ft.	†
AT314-B	88929701	PWA - AQX, 8HYT	†
	96870320	PWA - Local Paddle Board, 8HST	†
	96870350	PWA - Remote Paddle Board, 8HWT	†
AT314-C/D	96720464	PWA - AQX, 9LHT	7-3
AT314-E	96890490	PWA - AQX, 9MKT	7-13
AT314-B/C/D/E BU272-A	96752762	Cable - I/O, 50 ft.	7-17
AT314-C/D/E	96720468	PWA - Local Paddle Board, 9LKT	7-21
	96720466	PWA - Remote Paddle Board, 9LJT	7-27
AU115-A	96754988	Switch Box - Dual Access	7-33
	96754987	Cable - Dual I/O Expansion, 50 ft.	7-35
BU272-A	96752133	PWA - DMAX, 7GGT	7-39
	96890024	PWA - DMAX, 9MJT	7-53
	96890480	PWA - DMAX, 9MJT Subassembly	7-55
	96870341	PWA - Local Paddle Board, 8HVT	7-59
	96870340	PWA - Remote Paddle Board, 8HUT	7-59
	96754990	Cable - Expansion Connect, 18 in.	††
CW218-A	96752780	Finalization Kit - IOX	7-65
	96837799	Backplane - Wired, IOX	7-69
	96754820	Connector Assembly - Expansion Interrupt	7-71
	96752796	Terminator - Slot D	7-73
	88984800	Power Supply - Four Output	††

†Refer to the field print package for this equipment.

††No drawing - For reference only.

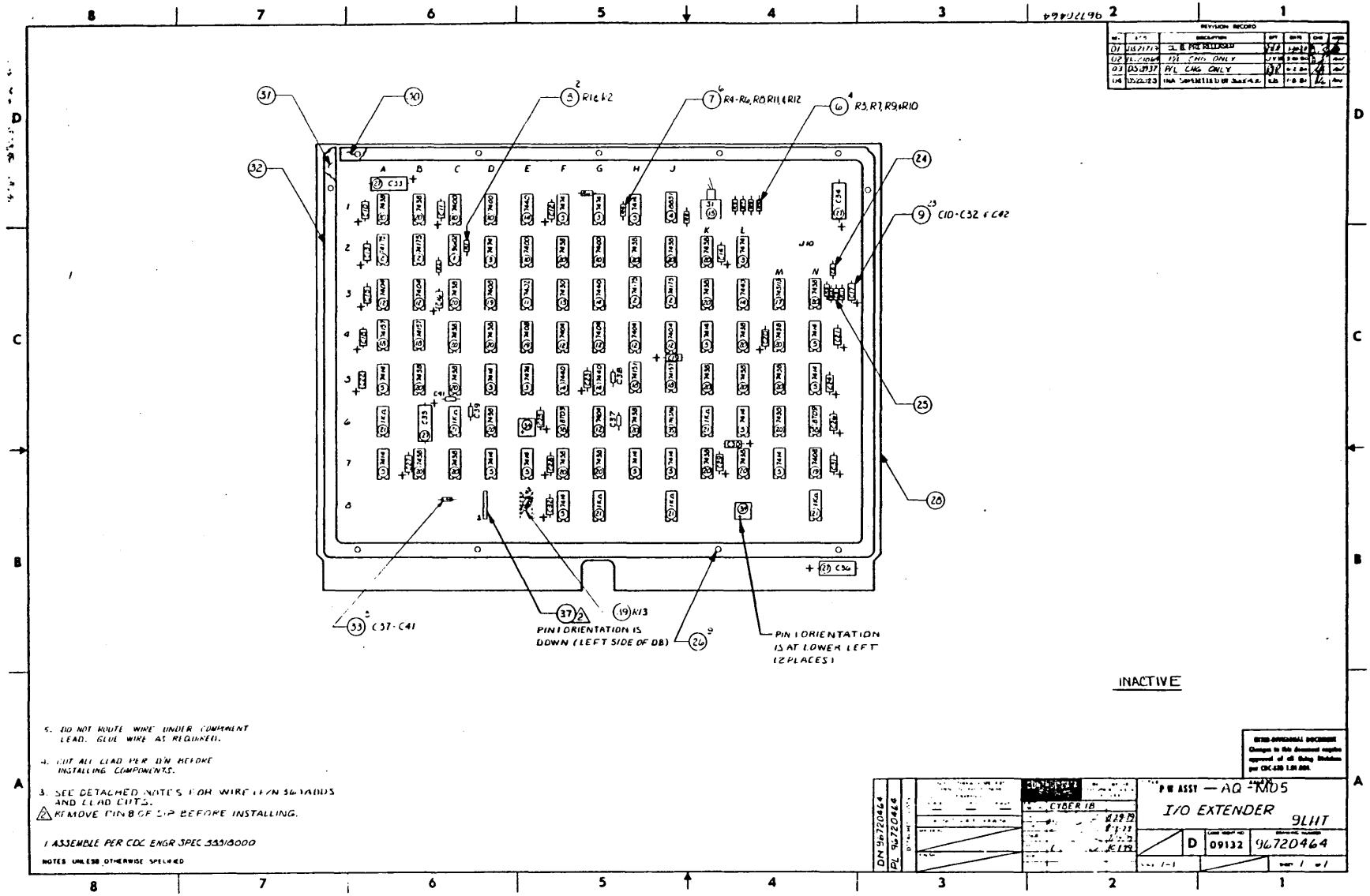
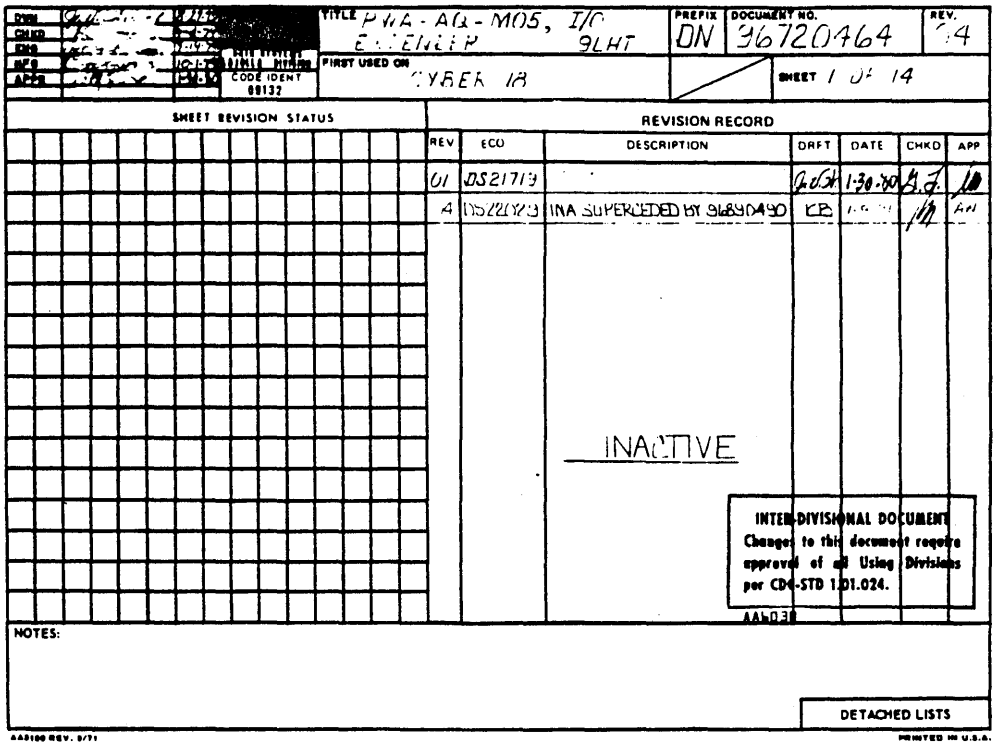


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 1 of 10)



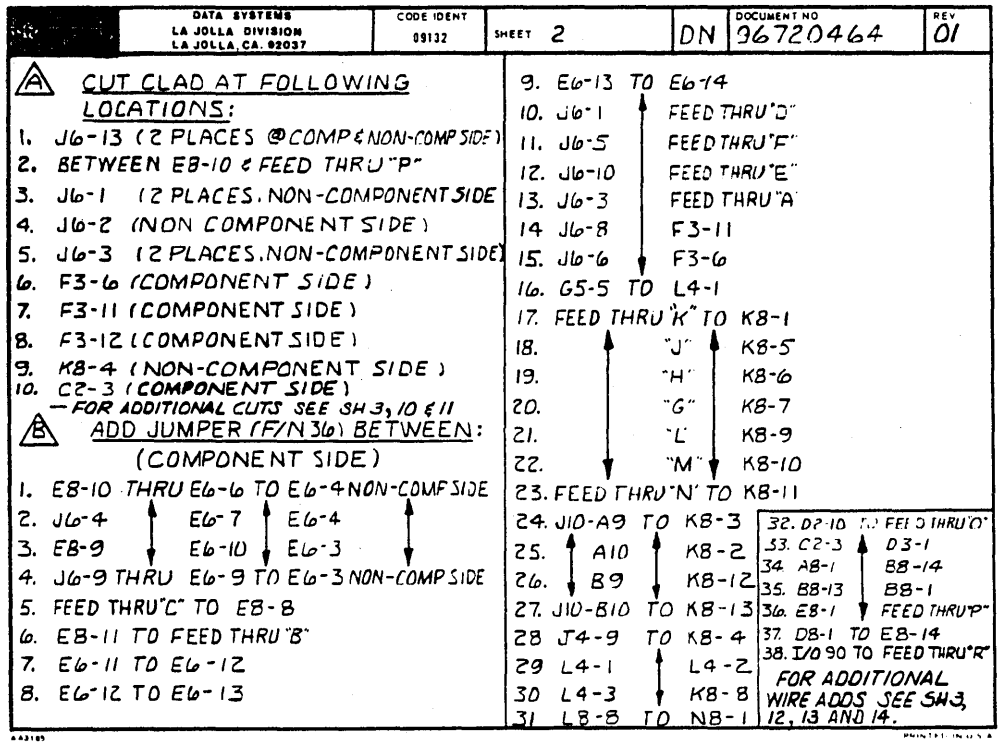


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 2 of 10)

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 3	DN	DOCUMENT NO 96720464	REV 01

A. CUT CLAD

11. C2-5 (NON-COMPONENT SIDE)
12. C6-10 (COMPONENT SIDE)
13. N8-13 (NON-COMPONENT SIDE)
14. N8-13 (COMPONENT SIDE)

REMOVE IC AT LOC F6 AND N6 CUT CLAD AS FOLLOWS:

15. N6-4 (COMPONENT SIDE)
16. N6-12 (COMPONENT SIDE)
17. BETWEEN F6-9 AND F6-10 (COMP. SIDE)
18. F6-4 (COMPONENT SIDE)
19. F6-12 (COMPONENT SIDE)
20. F6-13 (COMPONENT SIDE)
21. N6-2 (NON-COMPONENT SIDE)
22. N6-5
23. N6-10
24. N6-13
25. F6-2
26. F6-5 (NON-COMPONENT SIDE)

B. ADD JUMPER (FN36) BETWEEN: COMPONENT SIDE

39.	J6-7	TO	J5-8
40.	F6-4		F6-2
41.	F6-2		F6-12
42.	F6-12		G6-2
43.	G6-2		N6-2
44.	N6-2		N6-4
45.	N6-4		N6-10
46.	N6-10		N6-12
47.	F6-5		F8-4
48.	F6-10		D2-6
49.	F6-13		F8-12
50.	N6-13		N5-8
51.	N6-5		N5-2

REPLACE IC (15155000) AT LOCATIONS F6 AND N6.

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 4	DN	DOCUMENT NO 96720464	REV 01

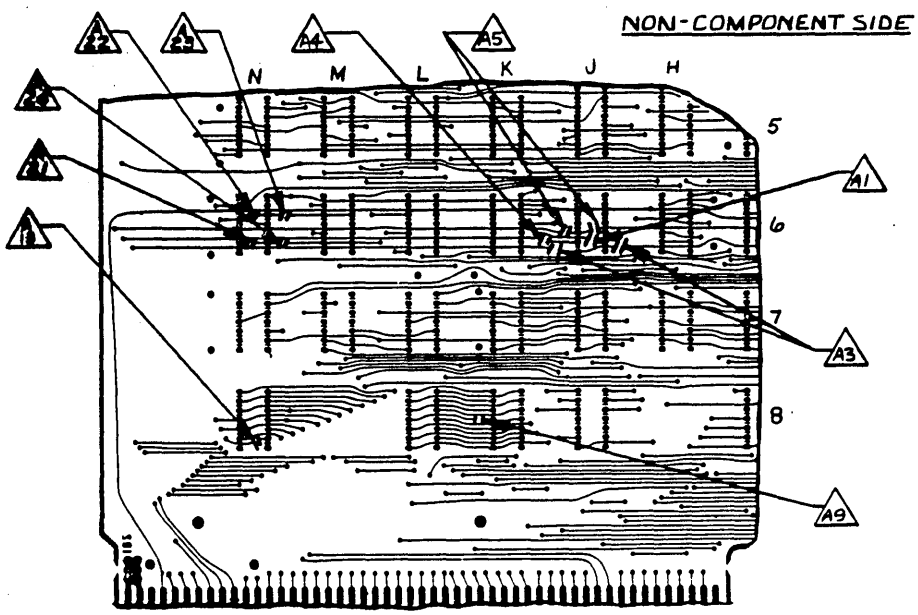


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 3 of 10)

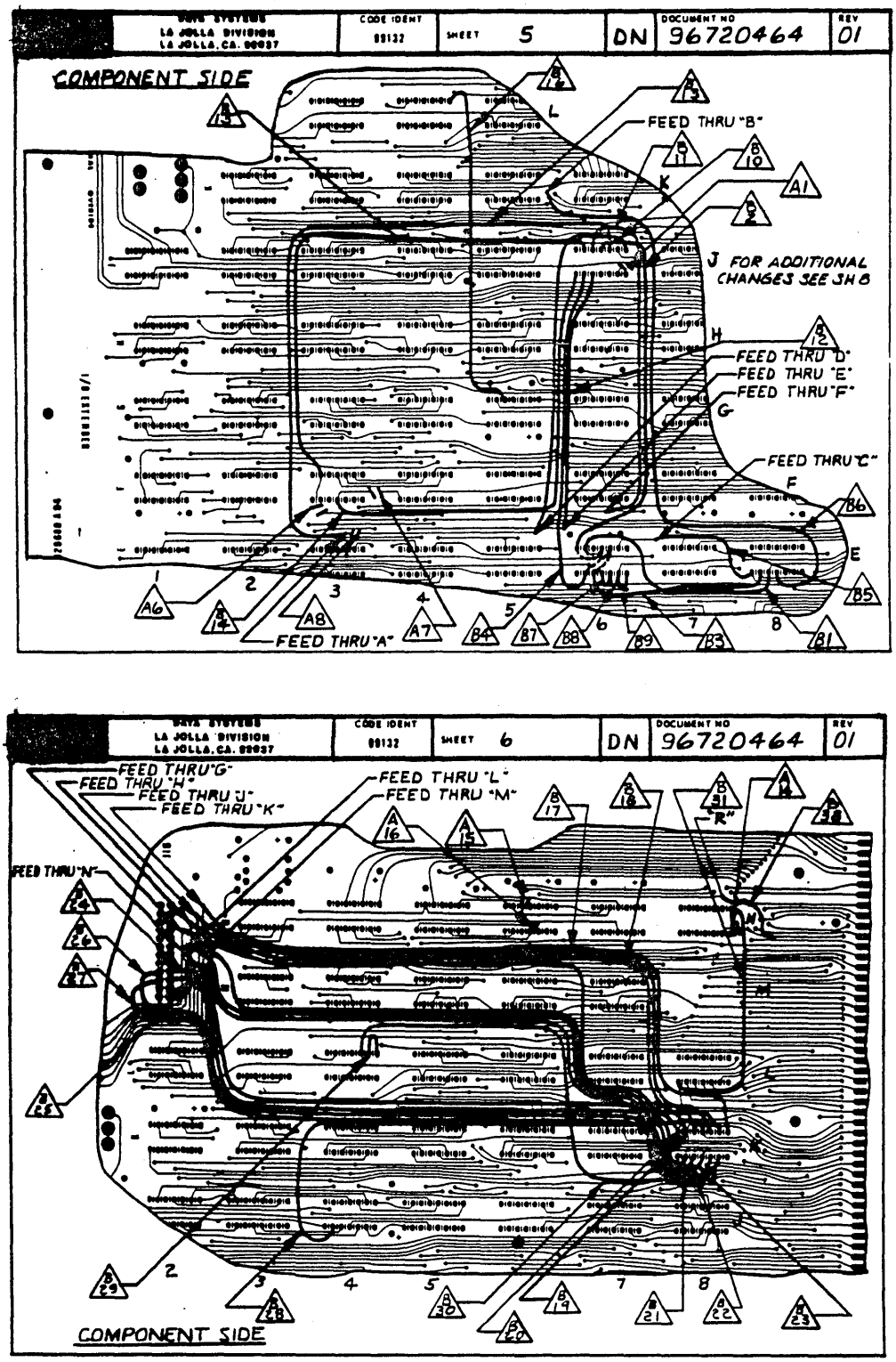
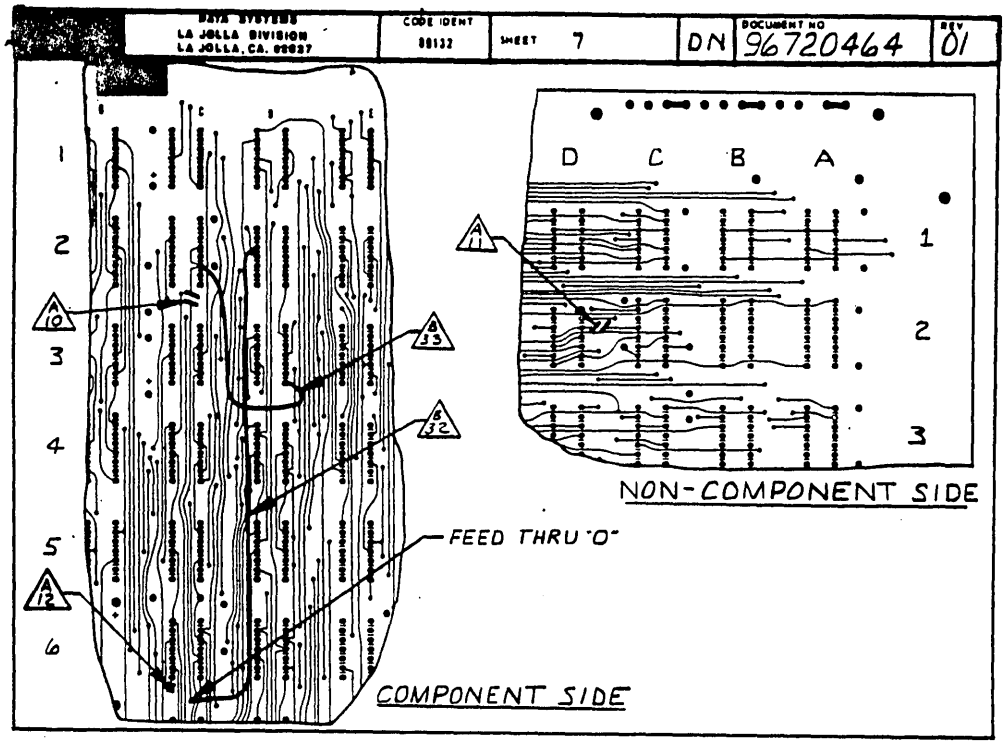


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 4 of 10)



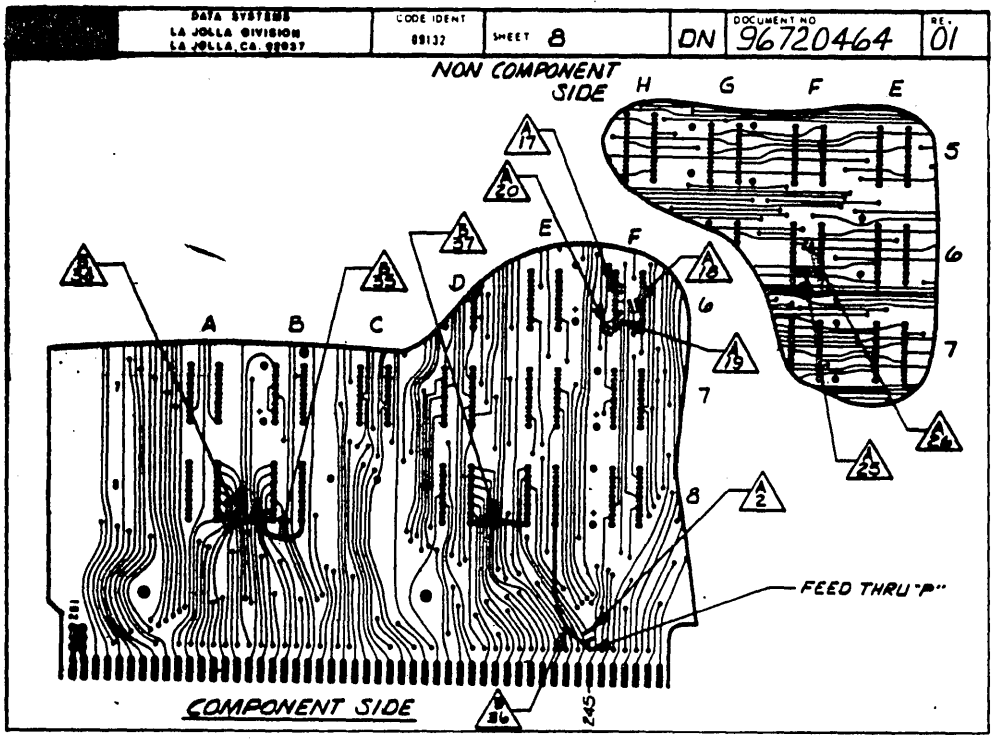


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 5 of 10)

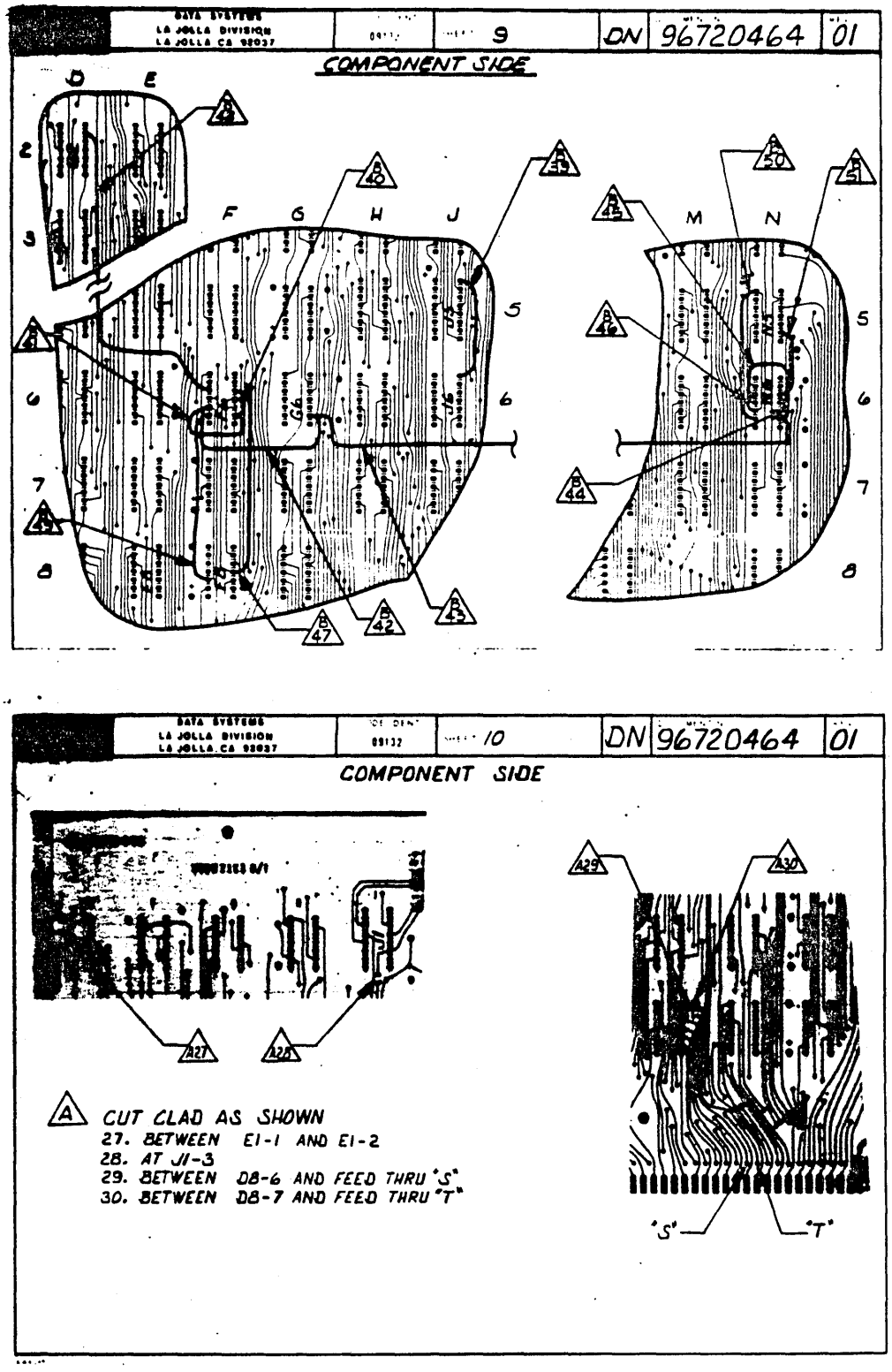
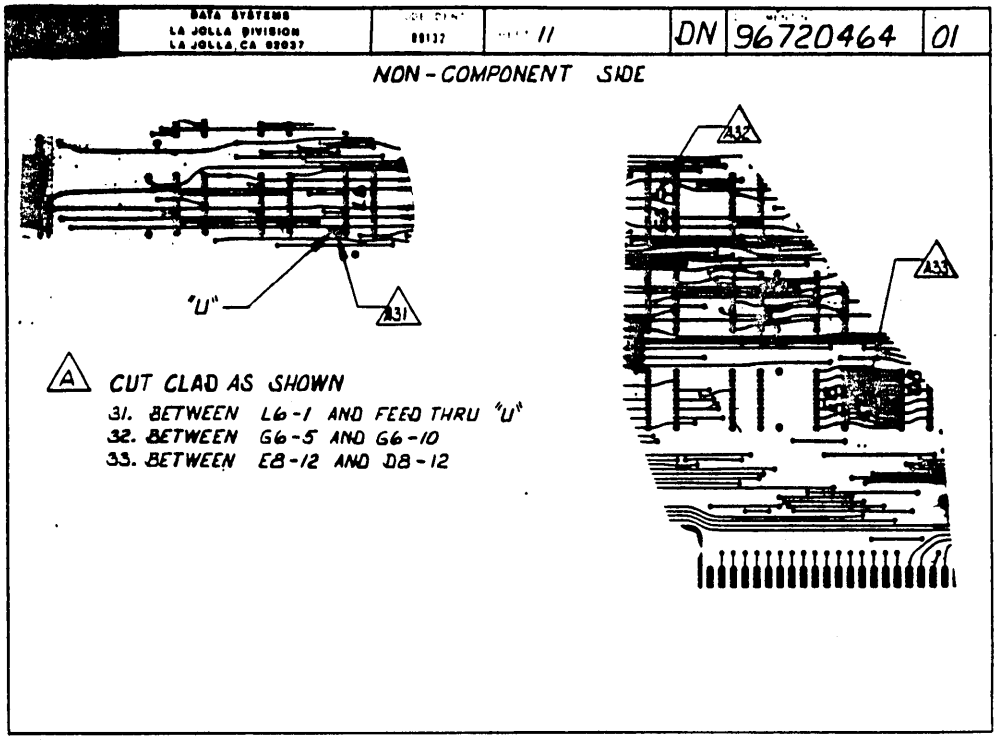


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 6 of 10)



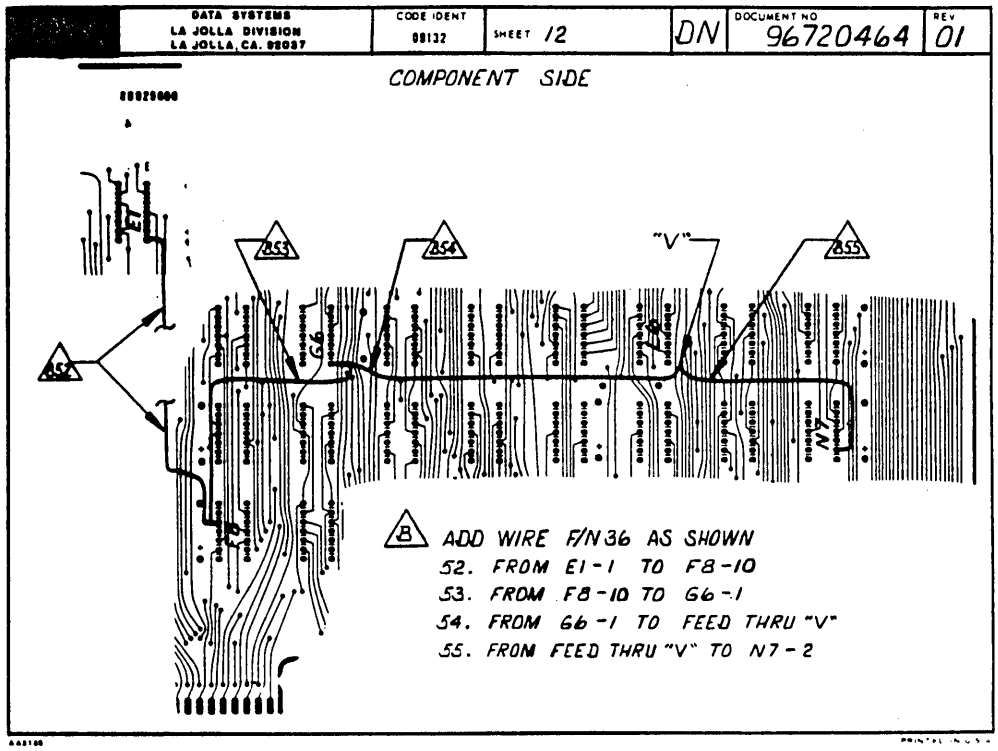
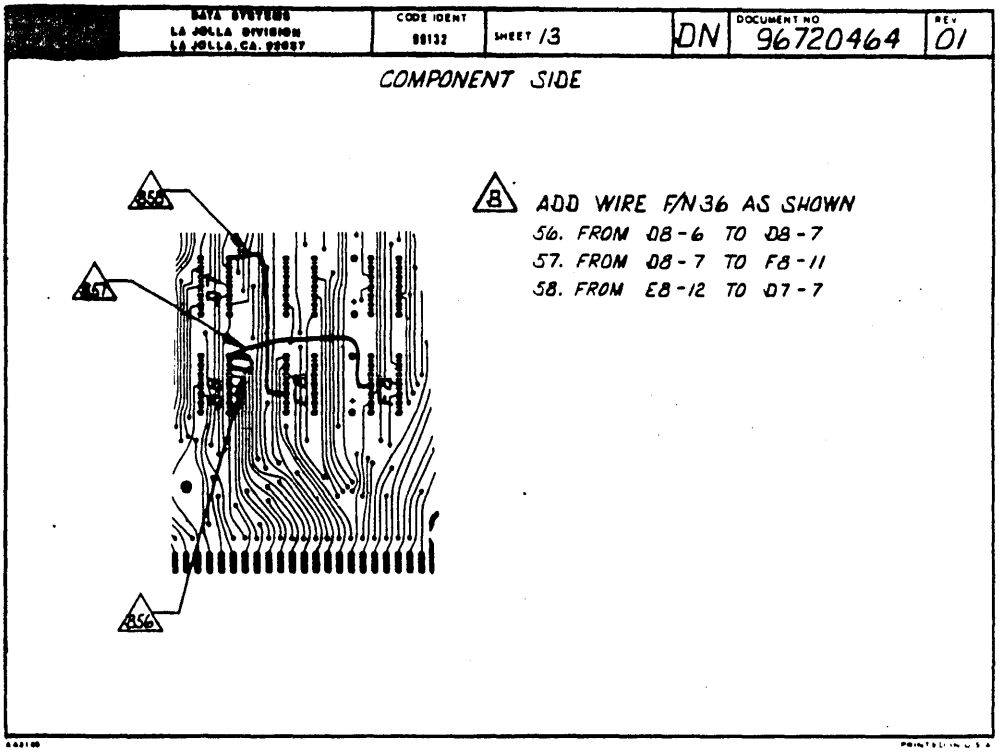


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 7 of 10)



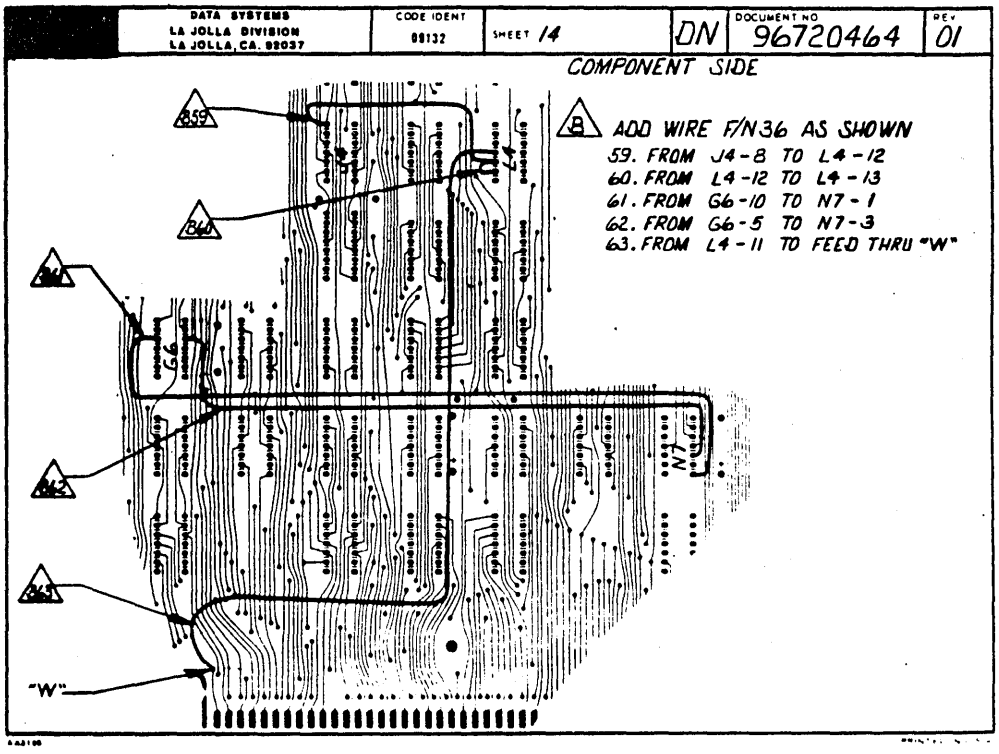


Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 8 of 10)

DWN			TITLE PWA AQ-MOS I/O EXTENDER 9L-T	PREFIX PL	DOCUMENT NO. 96720464	REV. 04
CHKD						
ENG						
MFG			FIRST USED ON CYBER 18		SHEET 1 OF 3	
APPD			CODE IDENT 08132			

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS21719	CC B. [illegible] RELEASED				
02	DS21864	P/N [illegible] ADDED				
03	DS21937	96830130 WAS REF				
04	DS22029	INA GIVE PROCEDED BY 96A90490				

INACTIVE

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1101.024.

NOTES:

DETACHED LISTS

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

96720464 04 I O PWA-A/G-MOS-I/O EXTENDER 9L-T DSN C44 IN 81/27/80 022029 12/17/80 MF

SCHD REQ IPED

Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 9 of 10)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

ASSEMBLY NUMBER	REV		UM	ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD NUMBER	PROCESSING DATE	PAGE NUMBER
96720444	04	I	D	PWA-A/Q-MOS-I/O EXTENDER 9LHT	DSM	CBF 18	01/27/80	022029	12/17/80	1/2 MF

FIND NUMBER	RV	PART NUMBER	QUANTITY	UNIT MEAS	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/BUY PART TYPE	PK NC	S OR
1	A	15104300	1.00	PC	INT. CKT 9602	IN			PPP4		N
2	A	15104500	4.00	PC	ACCEPT TEST TYPE 74175	IN			PPP4		N
3	A	15104800	5.00	PC	IC SPEC DUAL D TYPE FF 7474	IN			PPP4		N
4	A	15112600	1.00	PC	IC DM8831	IN			PPP4		N
5	C	15124800	14.00	PC	IC SN7414	IN			PPP4		N
35	A	15146400	1.00	PC	IC TTL QUAD 2INPUT EXC 74LS86	IN			PPP4		N
38	A	15155000	2.00	PC	IC TRI STATE QUAD BUS DRV 8T09	IN			PPP4		N
39	C	24500040	1.00	PC	RES FXD .25W 110 OHMS	IN			PPP4		N
6	C	24500043	4.00	PC	RES FXD .25W 150 OHMS	IN			PPP4		N
7	C	24500063	6.00	PC	RES FXD .25W 1000 OHMS	IN			PPP4		N
8	C	24500094	2.00	PC	RES FXD .25W 20000 OHMS	IN			PPP4		N
10	A	36186800	4.00	PC	INT CKT 7400 TTL QUAD 2 INPUT	IN			PPP4		N
11	A	36187000	1.00	PC	INT CKT 7402 TTL QUAD 2 INPUT	IN			PPP4		N
12	A	36187100	7.00	PC	INT CKT 7404 TTL HEX INVERTER	IN			PPP4		N
13	A	36187400	1.00	PC	INT CKT 7430 TTL 8 INPUT NAND	IN			PPP4		N
14	A	36187500	5.00	PC	INT CKT 7440 TTL DUAL 4 INPUT	IN			PPP4		N
15	A	39397300	1.00	PC	SWITCH,TOGGLE SPDT 2 POS	IN			PPP4		N
17	A	50255000	1.00	PC	IC- STTL DUAL J-K, 74S113	IN			PPP4		N
18	A	51784000	4.00	PC	I.C. 74157	IN			PPP4		N
19	A	51801200	3.00	PC	IC GATE QUAD 2-INPUT AND	IN			PPP4		N
36	C	52629949	340.00	IN	WIRE ELEC 30 GA WHITE	IN			PPP1		N
20	A	62031200	27.00	PC	INTEGRATED CIRCUIT 7438	IN			PPP4		N
21	A	75009901	6.00	PC	RESISTOR MODULE 1K OHM 2 0/0	IN			PPP4		N
33	A	84996721	5.00	PC	CAP,CER 100V 470 PF	IN			PPP4		N
24	A	84996725	1.00	PC	CAP,CER 100V 680 PF	IN			PPP4		N
25	A	84996730	1.00	PC	CAP,CER 100V 1200 PF	IN			PPP4		N
26	A	88812400	9.00	PC	RIVET-SEMI-TUBULAR,BRS .312 LG	IN			PPP4		N
27	A	88880500	4.00	PC	CAP ELECT-ALUM 16VDC 100UF	IN			PPP4		N
30	C	88896600	1.00	PC	INSULATOR-CARD FRAME,UPPER	IN			PPP4		N
31	C	88896700	1.00	PC	INSULATOR-CARD FRAME,LOWER	IN			PPP4		N
32	C	88896800	1.00	PC	FRAME-CARD (CASTING)	IN			PPP4		N
9	A	88897800	24.00	PC	CAP-FIXED SOLID TANT,6VDC,12UF	IN			PPP4		N
37	A	88924706	1.00	PC	RES NETWORK-SIP,8 PIN,1.K OHM	IN			PPP4		N
28	D	88929600	1.00	PC	PWB I/O EXTENDER (SWAT)	IN			PPP4		N
34	A	94398002	2.00	PC	SWITCH,SLIDE-DIP-PCB,4 POS	IN			PHP4		N
29	C	96720465	REF	PC	LOGIC-A/Q-MOS-I/O EXT 9LHT	IN			RFE4		N

SCMD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-1. AQ Extender (AQX) PWA, 9LHT (Sheet 10 of 10)

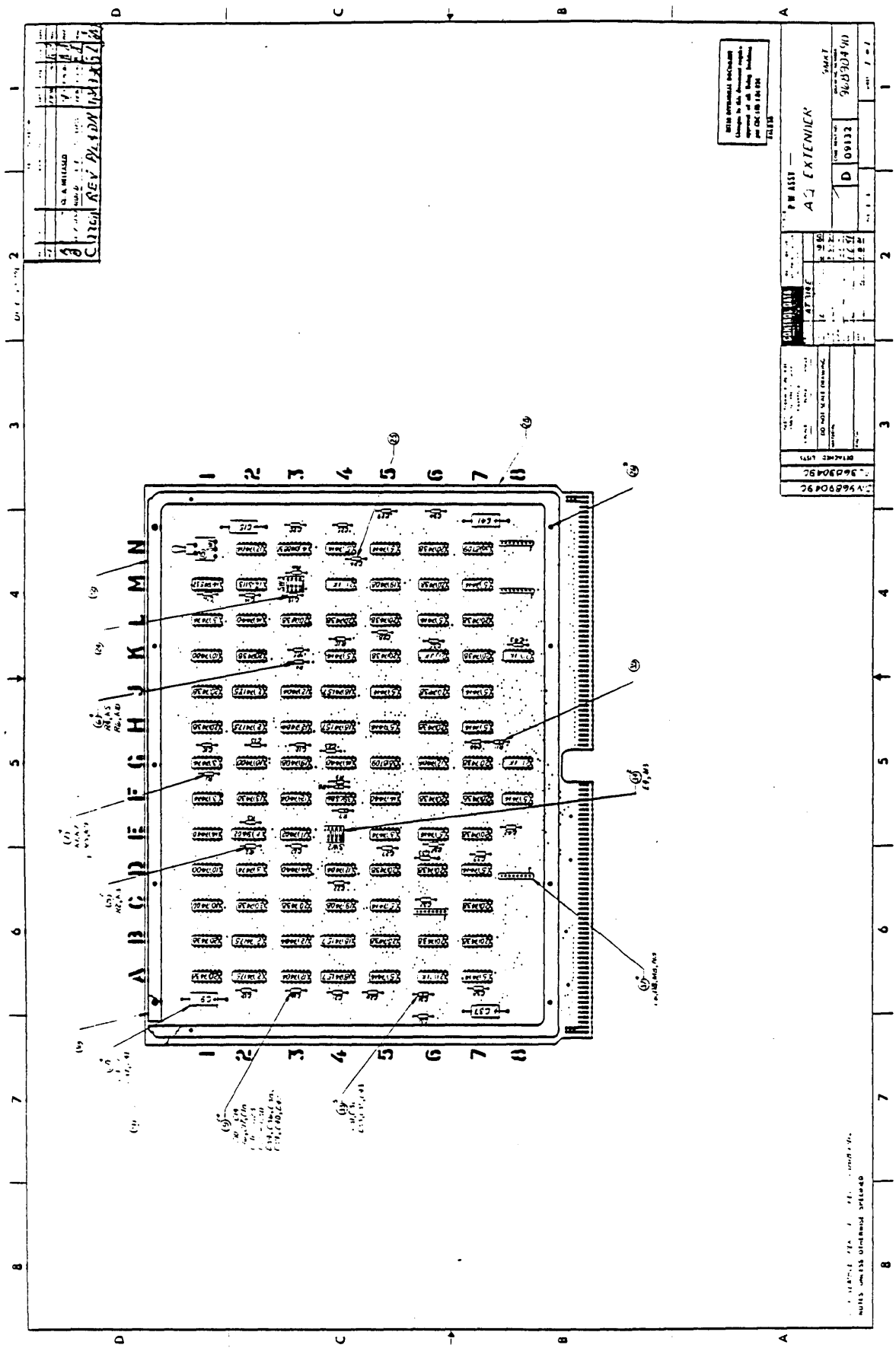
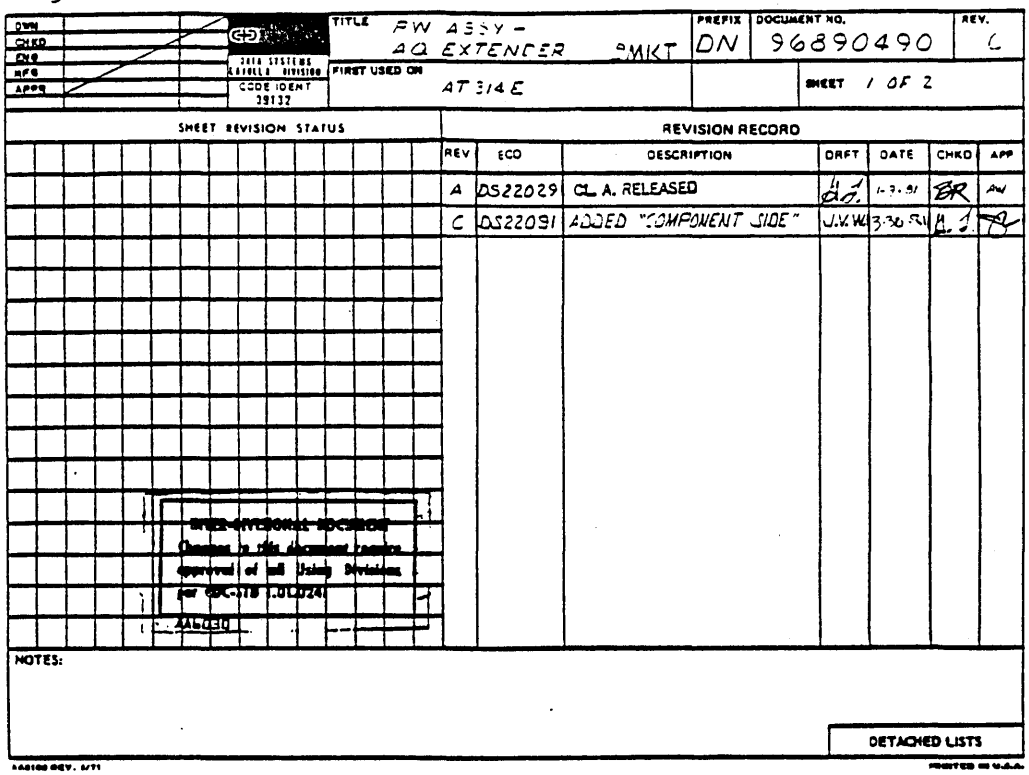


Figure 7-2. AQ Extender (AQX) PWA, 9MKT (Sheet 1 of 4)



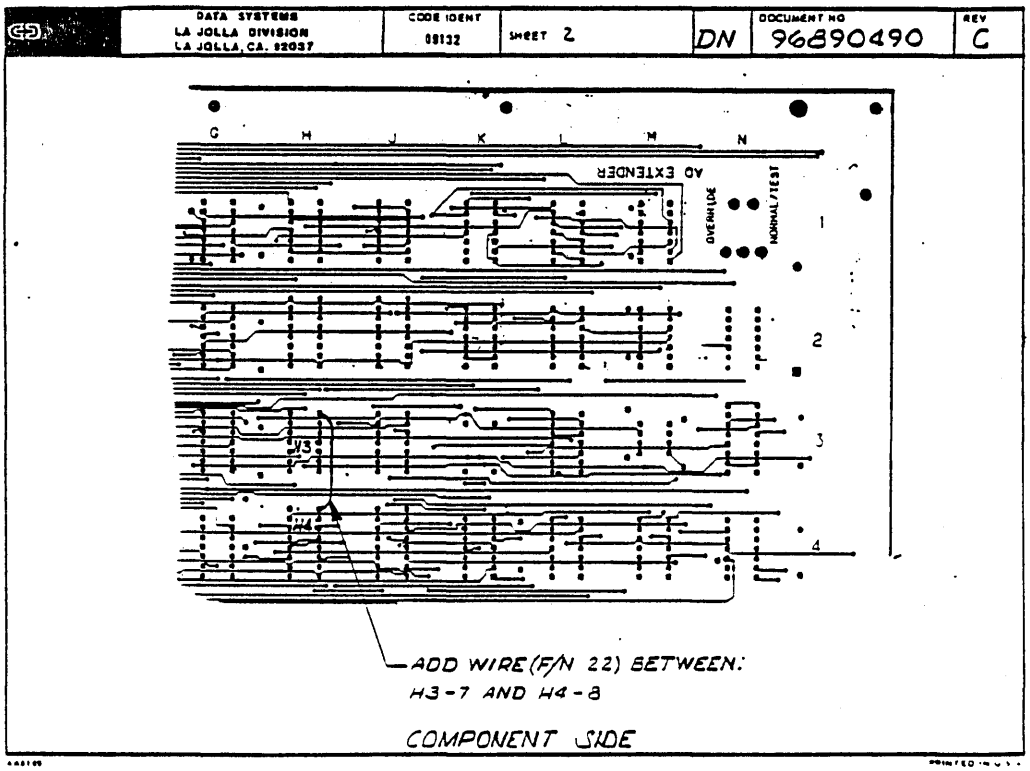


Figure 7-2. AQ Extender (AQX) PWA, 9MKT (Sheet 2 of 4)

DRN			TITLE PWA SSY — AQ EXTENDER 9MKT	PREFIX PL	DOCUMENT NO. 96890490	REV. C
CHKD		CONTROL DATA CORPORATION, MFG SYSTEMS, LA JOLLA DIVISION	FIRST USED ON AT314E		SHEET 1 OF 3	
DSG		CODE IDENT 09132				
APPD						

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
-1		CLASS C	J.V.W.			AW
A	DS22029	CL. A. RELEASED	KB			AW
C	DS22091	F/N35 WAS 24500040	J.V.W.			

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.024.

A46030

NOTES:

DETACHED LISTS

CONTROL DATA CORPORATION ASSEMBLY PARTS LIST

SHT. 2

Assembly Number	Rev	Assembly Description	Design Source	First Usage	Release Date	Change Ord. Number	Processing Date	Page Number
96890490	C 1 C	PWA-A/Q EXTENDER 9MKT	DSM	AT314E	12/16/80	022091	03/27/81	1/2

1	A	15106300	1.00	PC	INT. CKT 9602	IN			0004	N
2	A	15106500	4.00	PC	ACCEPT TEST TYPE 74175	IN			0004	N
3	A	15106800	5.00	PC	IC SPEC DUAL D TYPE FF 7474	IN			0004	N
4	A	15112600	1.00	PC	IC DM8831	IN			0004	N
5	C	15126800	15.00	PC	IC SN7414	IN			0004	N
35	A	15146600	1.00	PC	IC TTL QUAD 2INPUT EXC 74LS86	IN			0004	N
16	A	15154800	1.00	PC	IC 74S32	IN			0004	N
38	A	15155000	2.00	PC	IC TRI STATE QUAD BUS DRV 8T09	IN			0004	N
~~36~~	~~A~~	~~24500040~~	~~1.00~~	~~PC~~	~~RES FXD .25W 110 OHMS~~	~~OUT~~	~~022091~~	~~032781~~	~~0004~~	~~N~~
6	C	24500043	6.00	PC	RES FXD .25W 150 OHMS	IN			0004	N
39	C	24500055	1.00	PC	RES FXD .25W 470 OHMS	IN	022091	032781	0004	N
7	C	24500063	4.00	PC	RES FXD .25W 1000 OHMS	IN			0004	N
8	C	24500096	2.00	PC	RES FXD .25W 20000 OHMS	IN			0004	N
10	A	36186800	4.00	PC	INT CKT 7400 TTL QUAD 2 INPUT	IN			0004	N
11	A	36187000	1.00	PC	INT CKT 7402 TTL QUAD 2 INPUT	IN			0004	N
12	A	36187100	6.00	PC	INT CKT 7404 TTL HEX INVERTER	IN			0004	N
13	A	36187600	1.00	PC	INT CKT 7430 TTL 8 INPUT NAND	IN			0004	N
14	A	36187800	5.00	PC	INT CKT 7440 TTL DUAL 4 INPUT	IN			0004	N
15	A	39307300	1.00	PC	SWITCH,TOGGLE SPDT 2 POS	IN			0004	N
17	A	50255000	1.00	PC	IC- STTL DUAL J-K, 74S113	IN			0004	N
18	A	51784000	4.00	PC	I.C. 74157	IN			0004	N
19	A	51801200	3.00	PC	IC GATE QUAD 2-INPUT AND	IN			0004	N
22	C	52439040	2.00	IN	WIRE ELEC 30 GA WHITE	IN	022029	010781	0001	N
20	A	62031200	27.00	PC	INTEGRATED CIRCUIT 7438	IN			0004	N
21	A	75009901	5.00	PC	RESISTOR MODULE 1K OHM 2 A/O	IN			0004	N
23	A	94004721	5.00	PC	CAP,CER 100V 470 PF	IN			0004	N
24	A	94004725	1.00	PC	CAP,CER 100V 680 PF	IN			0004	N
25	A	94004730	1.00	PC	CAP,CER 100V 1200 PF	IN			0004	N
26	A	98812600	5.00	PC	RIVET-SEMI-TUBULAR,RDS .312 LG	IN			0004	N
27	A	66880530	4.00	PC	CAP ELECT-ALUM 16VDC 100UF	IN			0004	N
30	C	66906600	1.00	PC	INSULATOR-CARD FRAME,UPPER	IN			0004	N
31	C	88906700	1.00	PC	INSULATOR-CARD FRAME,LOWER	IN			0004	N
32	C	88906410	1.00	PC	FRAME-CARD (CASTING)	IN			0004	N
9	A	88807300	24.00	PC	CAP-FIXED SOLID TANT,6VDC,12UF	IN			0004	N
37	A	98026796	4.00	PC	RES NETWORK-SIP,6 PIN,1.6 OHM	IN			0004	N
34	A	54788707	2.00	PC	SWITCH,SLIDE-DIP-POS,4 POS	IN			0004	N

INTERDIVISIONAL DOCUMENT

Figure 7-2. AQ Extender (AQX) PWA, 9MKT (Sheet 3 of 4)

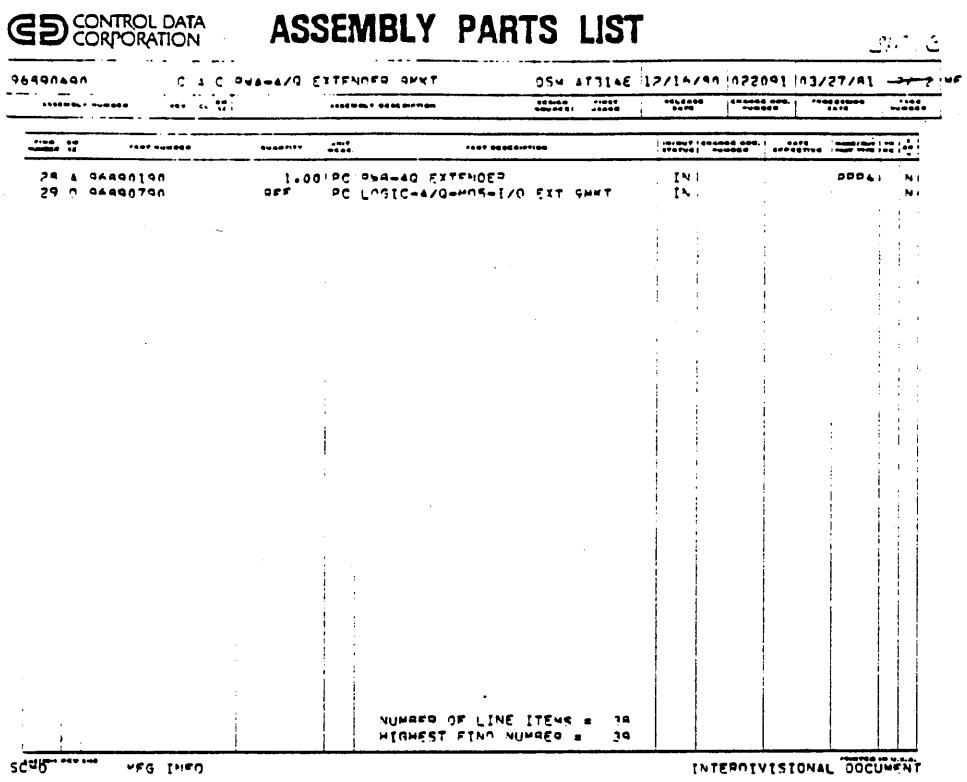


Figure 7-2. AQ Extender (AQX) PWA, 9MKT (Sheet 4 of 4)

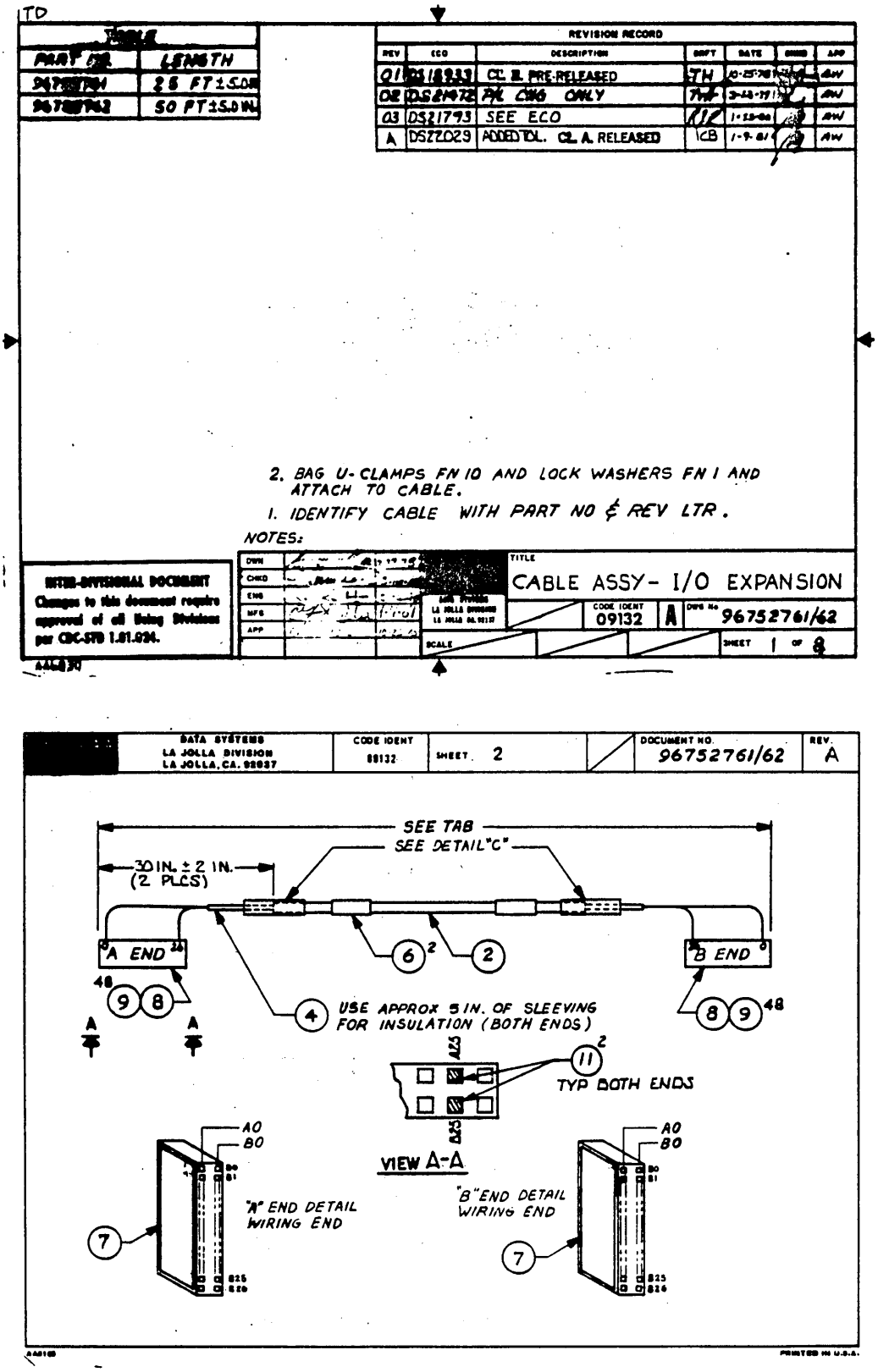
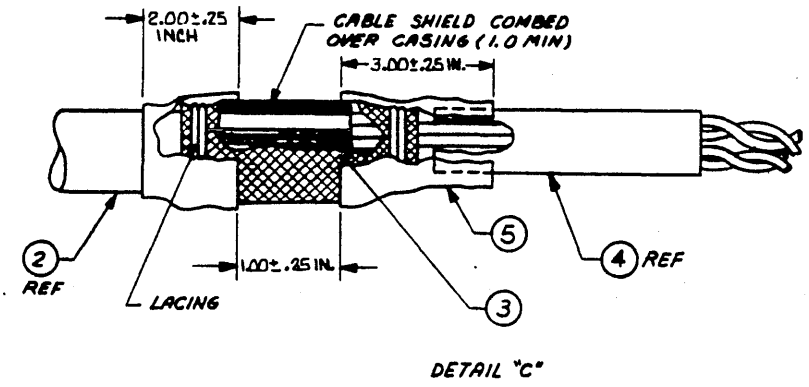


Figure 7-3. I/O Expansion Cable (Sheet 1 of 4)

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 3	DOCUMENT NO 96752761/62	REV A



DETAIL "C"

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037	CODE IDENT 09132	SHEET 4	WL	DOCUMENT NO 96752761/62	REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS
1	2	24	0		A END	A1	9	B END	A1	9	TW/PR (TYP)
2			9		GND	B1		GND	B1		
3			2			A2			A2		
4			9		GND	B2		GND	B2		
5			4			A3			A3		
6			9		GND	B3		GND	B3		
7			5			A4			A4		
8			9		GND	B4		GND	B4		
9			6			A5			A5		
10			9		GND	B5		GND	B5		
11			90			A6			A6		
12			9		GND	B6		GND	B6		
13			91			A7			A7		
14			9		GND	B7		GND	B7		
15			92			A8			A8		
16			9		GND	B8		GND	B8		
17			93			A9			A9		
18			9		GND	B9		GND	B9		
19			94			A10			A10		
20	2	24	9		A END GND	B10	9	B END GND	B10	9	

Figure 7-3. I/O Expansion Cable (Sheet 2 of 4)

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037	CODE IDENT 88132	SHEET 5	WL	DOCUMENT NO 96752761/62	REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS
21	2	24	96		A END	A11	9	B END	A11	9	
22			9		GND	B11		GND	B11		
23			96			A12			A12		
24			9		GND	B12		GND	B12		
25			97			A13			A13		
26			9		GND	B13		GND	B13		
27			98			A14			A14		
28			9		GND	B14		GND	B14		
29			900			A15			A15		
30			9		GND	B15		GND	B15		
31			910			A16			A16		
32			9		GND	B16		GND	B16		
33			920			A17			A17		
34			9		GND	B17		GND	B17		
35			930			A18			A18		
36			9		GND	B18		GND	B18		
37			940			A19			A19		
38			9		GND	B19		GND	B19		
39			950			A20			A20		
40	2	24	9		A END GND	B20	9	B END GND	B20	9	

AA3103 REV. B 71 PRINTED IN U.S.A.

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037	CODE IDENT 88132	SHEET 6	WL	DOCUMENT NO 96752761/62	REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS
41	2	24	960		A END	A21	9	B END	A21	9	
42			9		GND	B21		GND	B21		
43			970			A22			A22		
44			9		GND	B22		GND	B22		
45			980			A23			A23		
46			9		GND	B23		GND	B23		
47			990			A24			A24		
48	2	24	9		A END GND	B24	9	B END GND	B24	9	

AA3103 REV. B 71 PRINTED IN U.S.A.

Figure 7-3. I/O Expansion Cable (Sheet 3 of 4)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SHT·7

96752761	A	A	A	CABLE ASSY-I/O EXPANSION 25FT	DS	020151	10/25/78	022029	01/07/81	~~1 of 1~~ NF

1	A	10125006	4.00	PC	SPRING LOCK WASHERS (MED.)	IN			PPP1		N
~~11~~	~~C~~	~~90070100~~	~~4.00~~	~~PC~~	~~PLUG,CONNECTOR POLARIZING~~	~~OUT~~	~~021472~~	~~038179~~	~~PPP4~~		~~N~~
2	C	24518001	300.00	IN	CABLE ELEC 24 TWISTED PR	IN			PPP4		N
3	C	24534011	3.00	IN	SHIELD ELECT BRAIDED-BULK	IN			PPP4		N
4	A	25196921	10.00	IN	INSUL SLEEVE SHRINK 1/2 BLACK	IN			PPP3		N
5	A	25196922	10.00	IN	INSUL SLEEVE SHRINK 3/4 BLACK	IN	021793	011680	PPP3		N
6	B	39296400	2.00	PC	LABEL, CABLE MARKING	IN			PPP4		N
7	A	39397100	2.00	PC	LABEL,WRITE ON	IN			PPP3		N
8	A	39906904	2.00	PC	CONN, HOUSING- .100C.C. 54 CAV	IN			PPP4		N
11	C	92002400	4.00	PC	PLUG-POLARIZING	IN	021472	038179	PPP4		N
9	C	94245601	96.00	PC	CONTACT-CRIMP INSERT SOCKET	IN	022029	121680	PPP4		N
~~9~~	~~C~~	~~94245600~~	~~96.00~~	~~PC~~	~~CONTACT-CRIMP,INSERT,SOCKET~~	~~OUT~~	~~022029~~	~~121680~~	~~PPP4~~		~~N~~
10	A	96785700	2.00	PC	CLAMP,U-TYPE .75 GAPX1.25	IN			PPP4		N

NUMBER OF LINE ITEMS = 13
HIGHEST FIND NUMBER = 11

SCMD MFG INFO

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SHT. 8

96752762	A	A	A	CABLE ASSY-I/O EXPANSION 50FT	DSM	020151	10/25/78	022029	01/07/81	~~1 of 1~~ NF

1	A	10125006	4.00	PC	SPRING LOCK WASHERS (MED.)	IN			PPP1		N
~~11~~	~~C~~	~~90070100~~	~~4.00~~	~~PC~~	~~PLUG,CONNECTOR POLARIZING~~	~~OUT~~	~~021472~~	~~038179~~	~~PPP4~~		~~N~~
2	C	24518001	600.00	IN	CABLE ELEC 24 TWISTED PR	IN			PPP4		N
3	C	24534011	3.00	IN	SHIELD ELECT BRAIDED-BULK	IN			PPP4		N
4	A	25196921	10.00	IN	INSUL SLEEVE SHRINK 1/2 BLACK	IN			PPP3		N
5	A	25196922	10.00	IN	INSUL SLEEVE SHRINK 3/4 BLACK	IN	021793	011680	PPP3		N
6	B	39296400	2.00	PC	LABEL, CABLE MARKING	IN			PPP4		N
7	A	39397100	2.00	PC	LABEL,WRITE ON	IN			PPP3		N
8	A	39906904	2.00	PC	CONN, HOUSING- .100C.C. 54 CAV	IN			PPP4		N
11	C	92002400	4.00	PC	PLUG-POLARIZING	IN	021472	038179	PPP4		N
9	C	94245601	96.00	PC	CONTACT-CRIMP INSERT SOCKET	IN	022029	121680	PPP4		N
~~9~~	~~C~~	~~94245600~~	~~96.00~~	~~PC~~	~~CONTACT-CRIMP,INSERT,SOCKET~~	~~OUT~~	~~022029~~	~~121680~~	~~PPP4~~		~~N~~
10	A	96785700	2.00	PC	CLAMP,U-TYPE .75 GAPX1.25	IN			PPP4		N

NUMBER OF LINE ITEMS = 13
HIGHEST FIND NUMBER = 11

SCMD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-3. I/O Expansion Cable (Sheet 4 of 4)

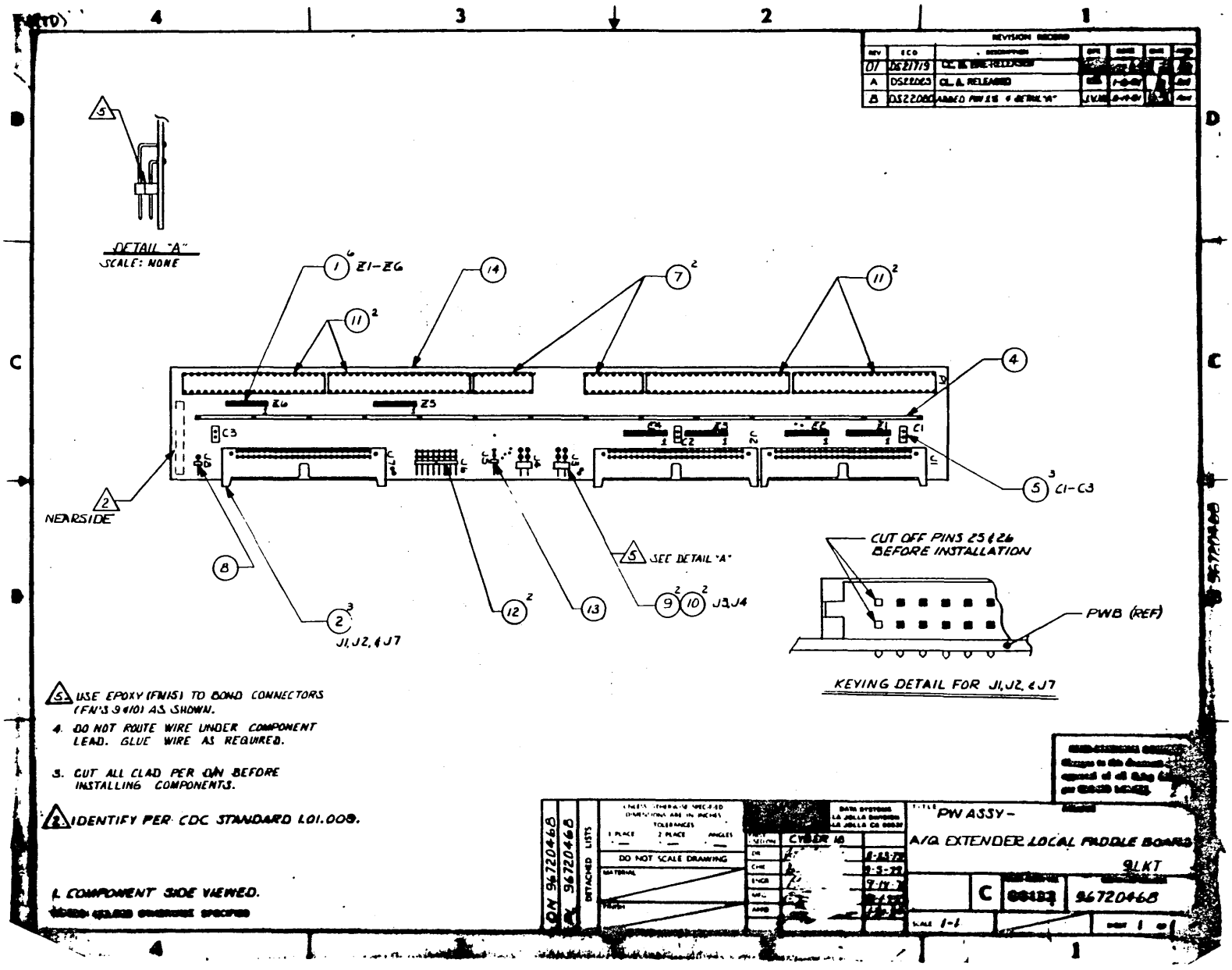
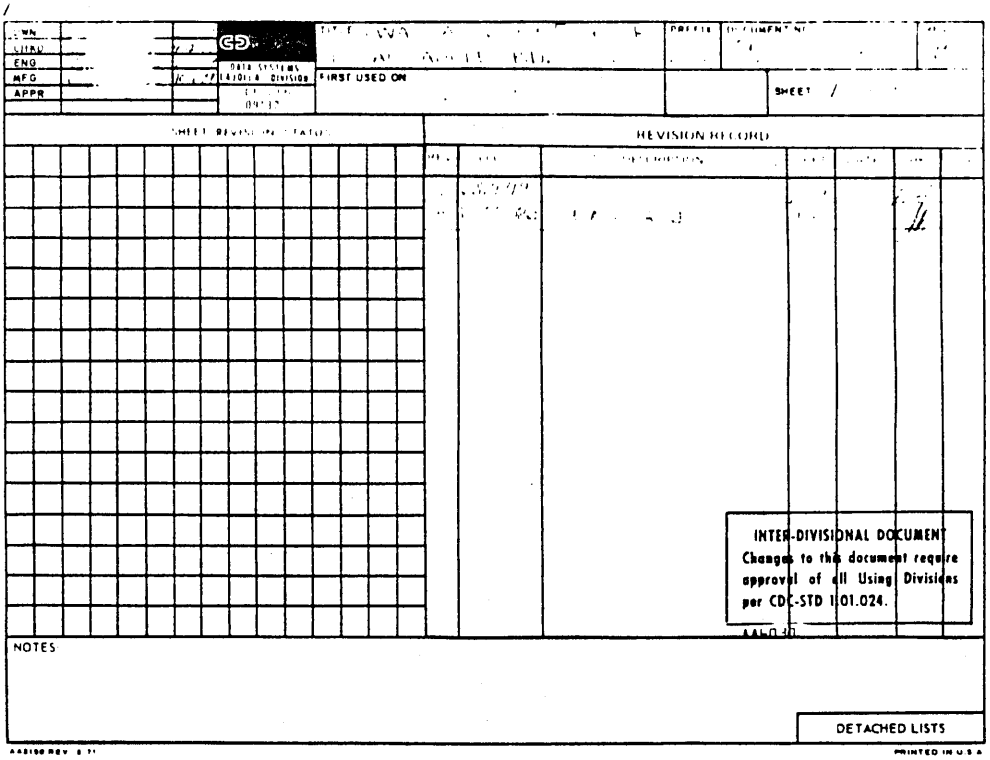


Figure 7-4. Local (AQX) Paddle Board PWA, 9LKT (Sheet 1 of 5)



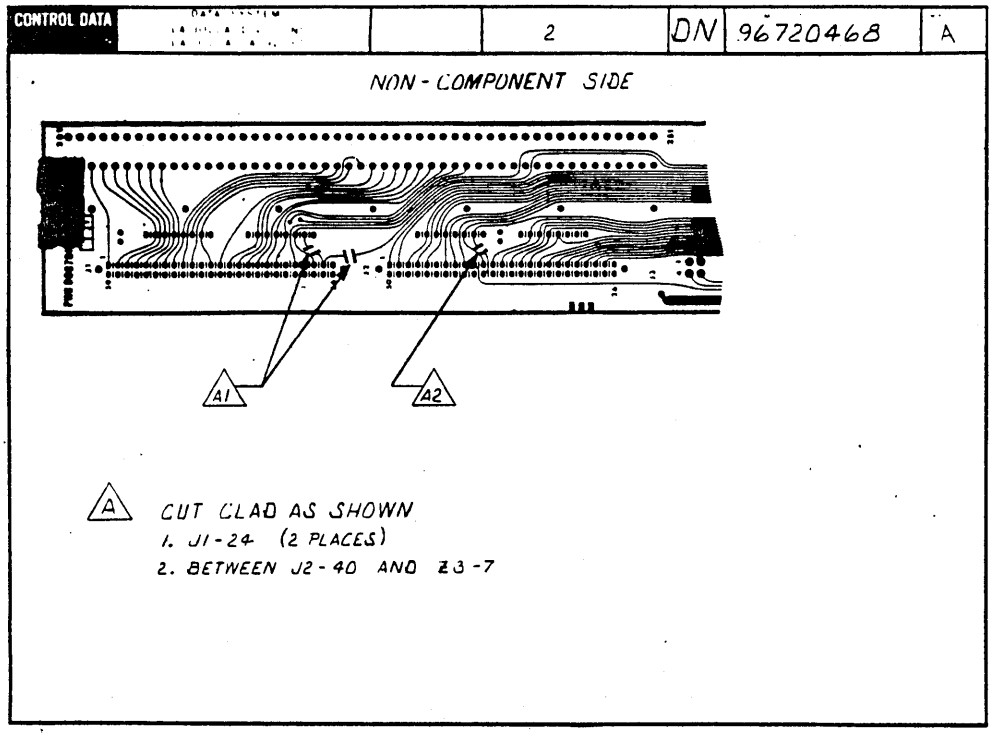
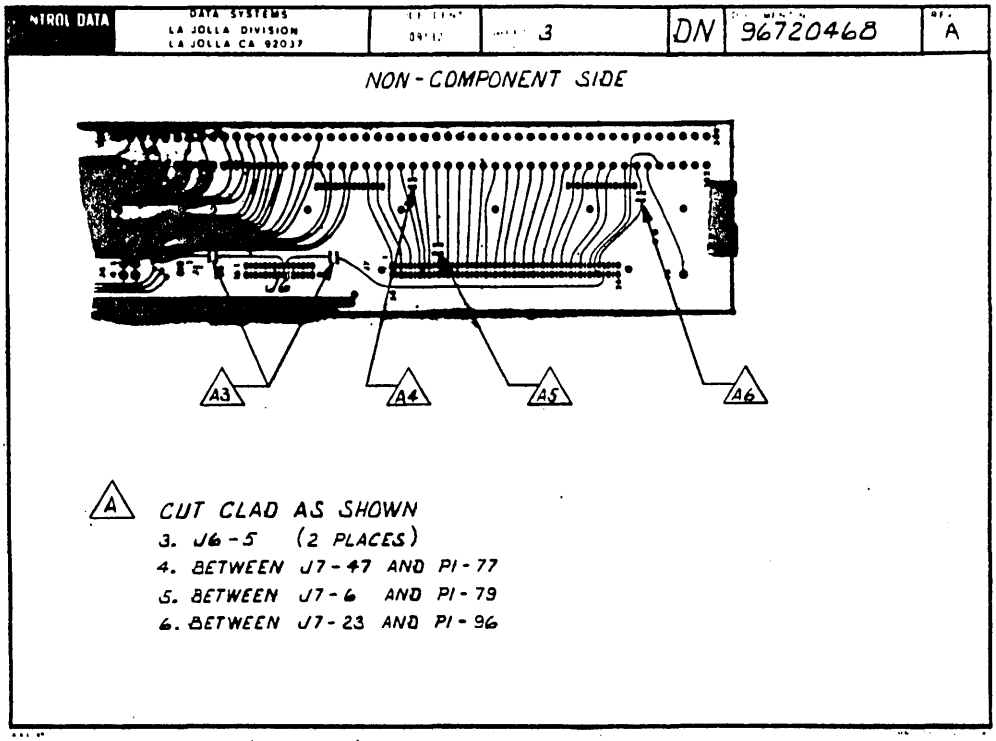


Figure 7-4. Local (AQX) Paddle Board PWA, 9LKT (Sheet 2 of 5)



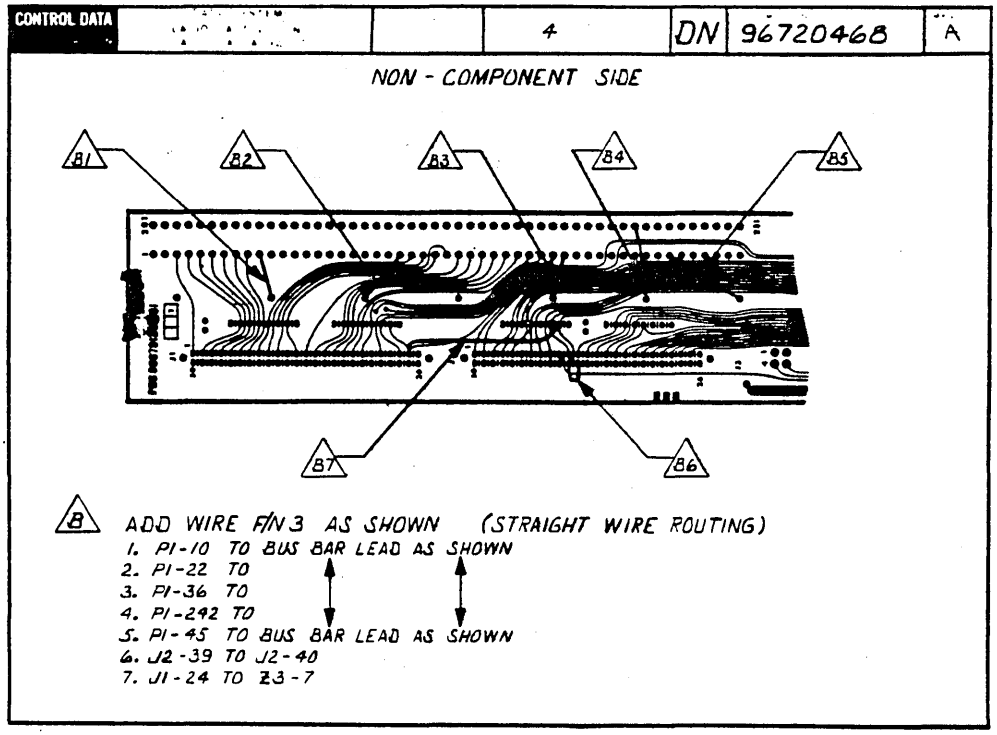
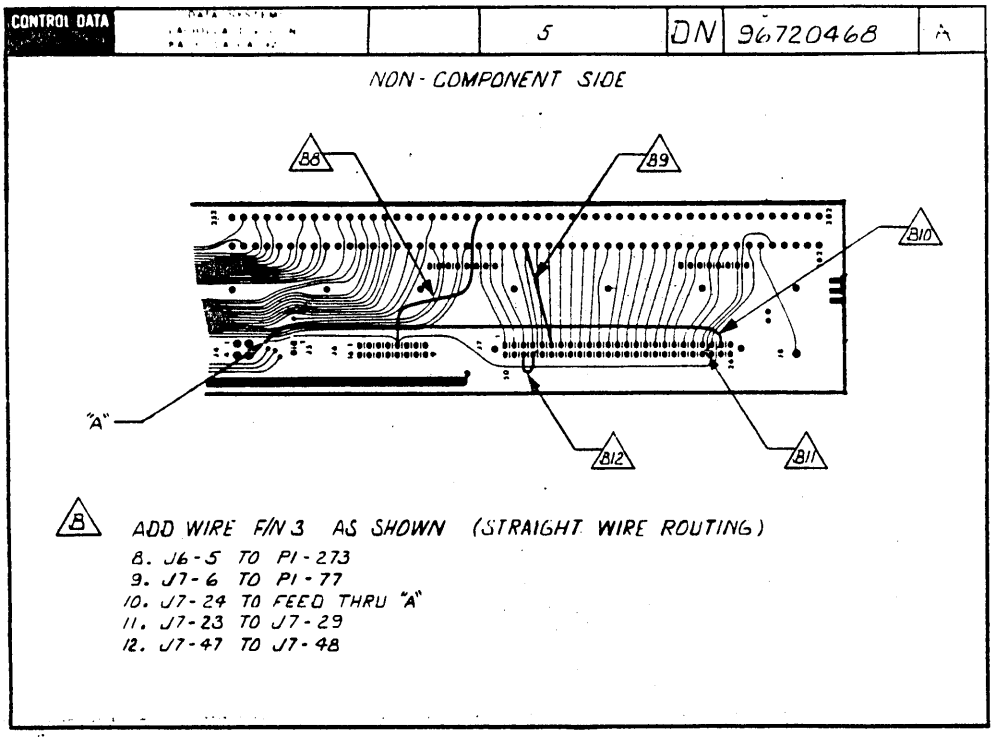


Figure 7-4. Local (AQX) Paddle Board PWA, 9LKT (Sheet 3 of 5)



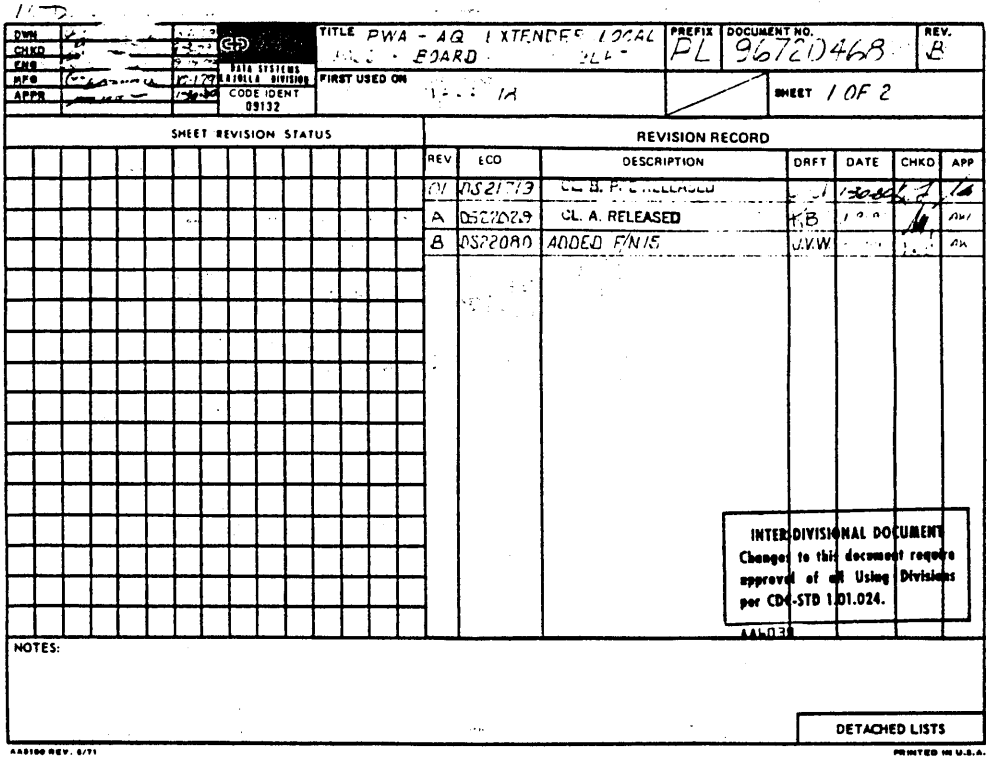


Figure 7-4. Local (AQX) Paddle Board PWA, 9LKT (Sheet 4 of 5)

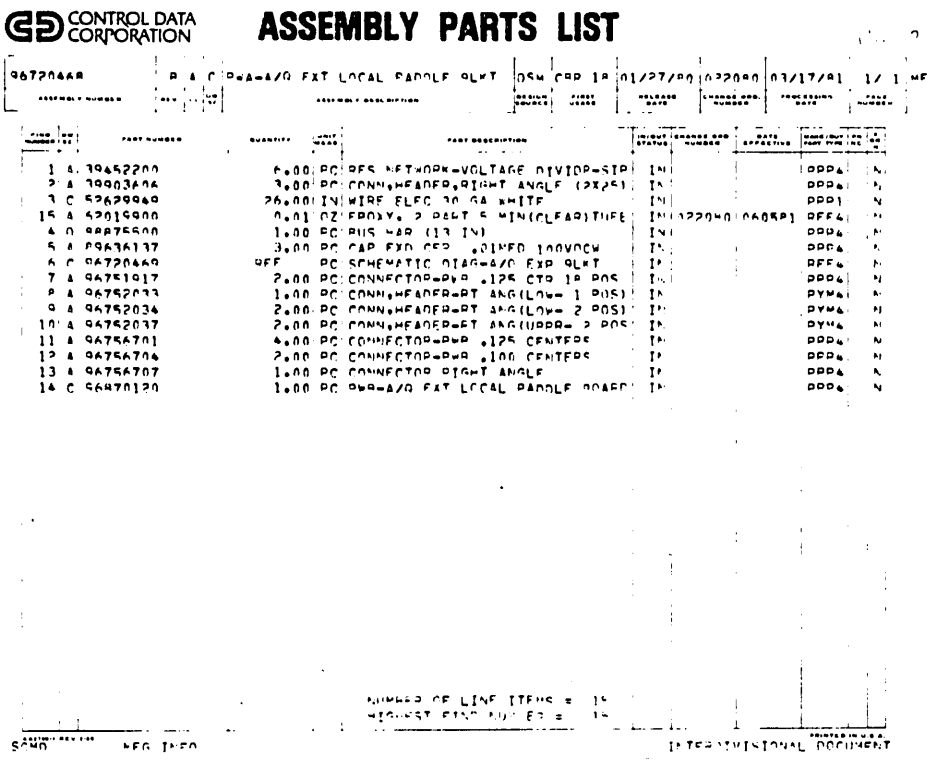


Figure 7-4. Local (AQX) Paddle Board PWA, 9LKT (Sheet 5 of 5)

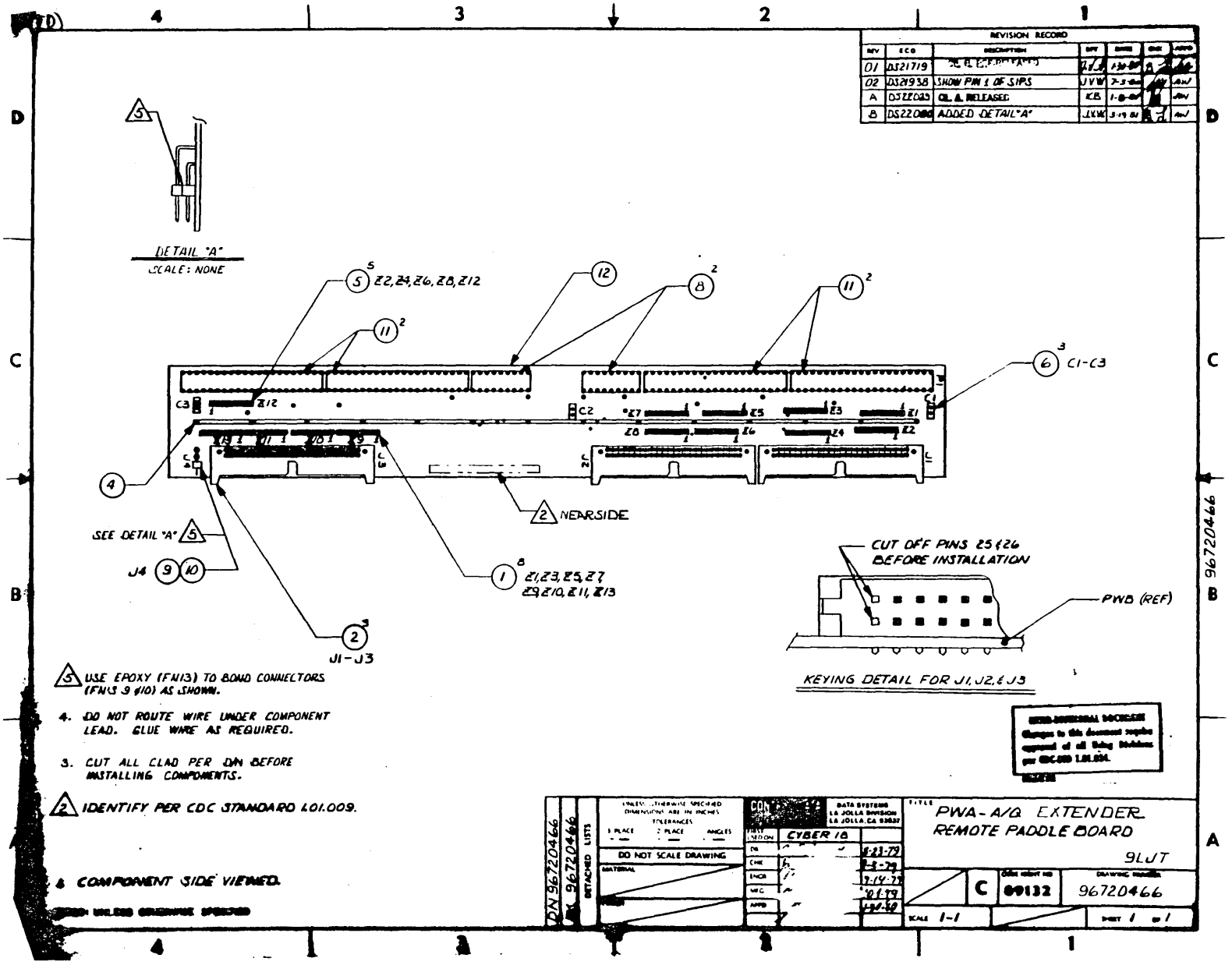
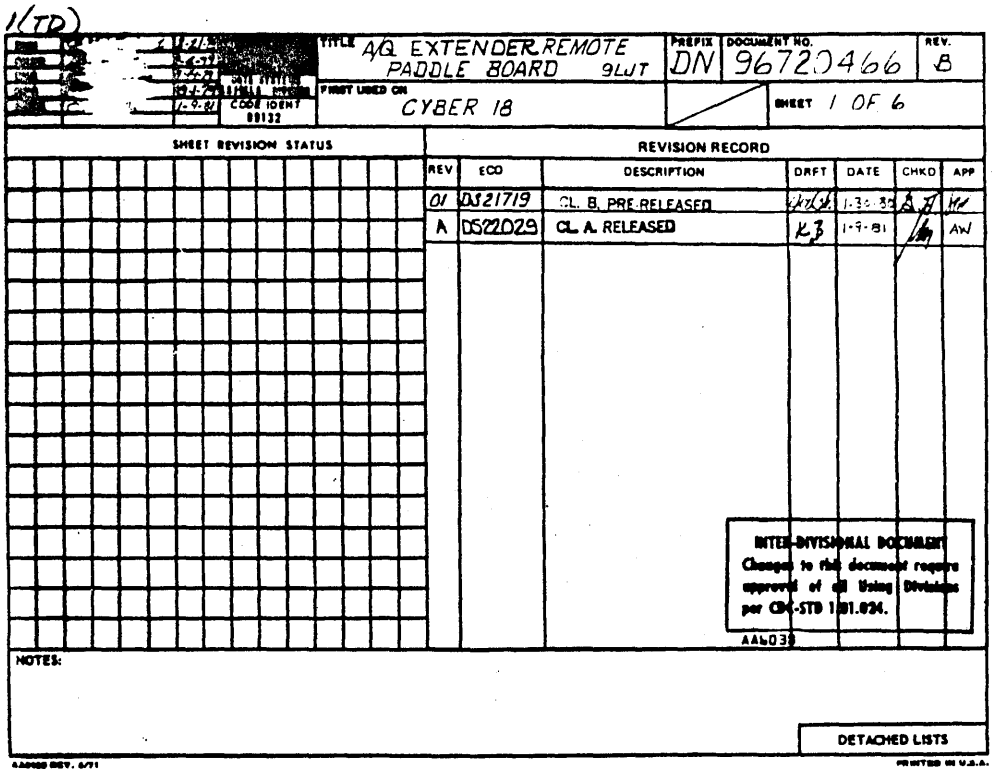


Figure 7-5. Remote (AQX) Paddle Board PWA, 9LJT (Sheet 1 of 5)



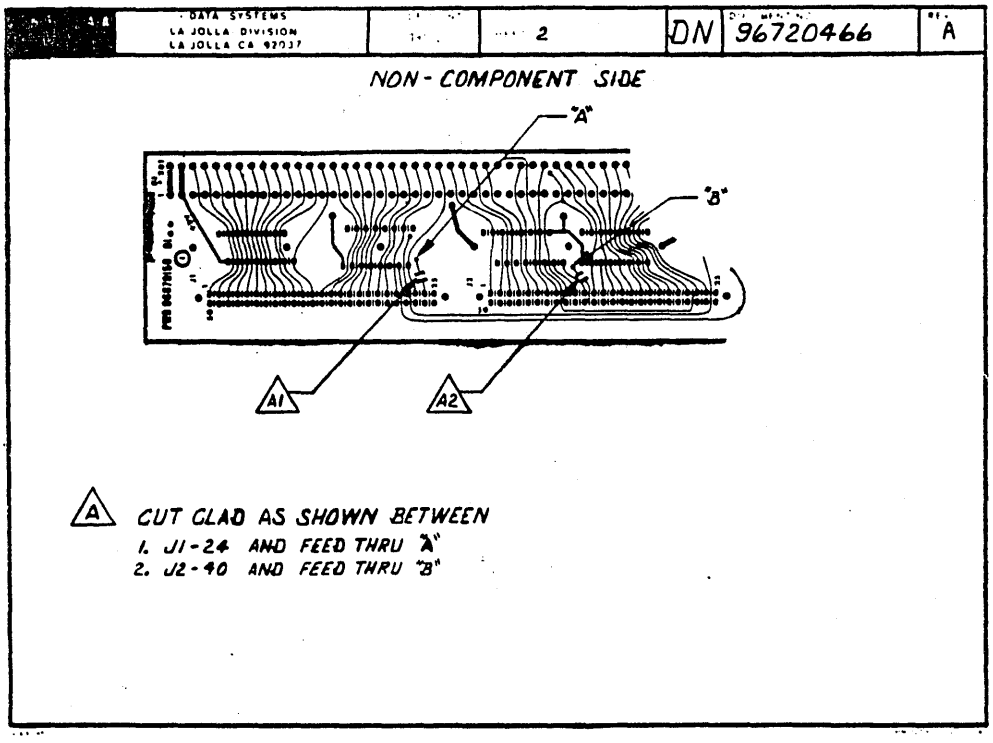
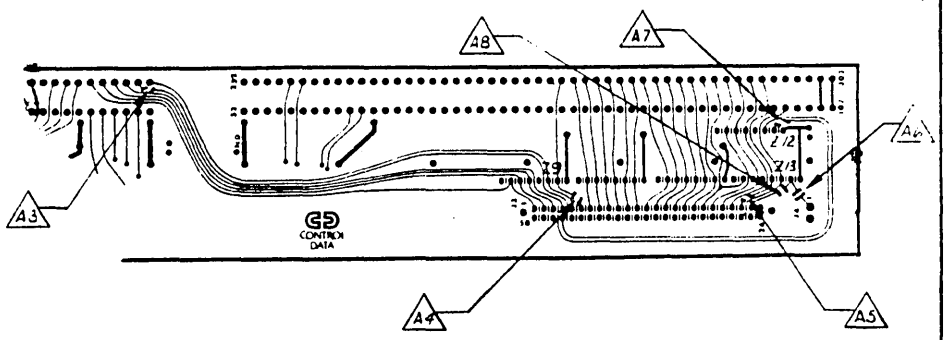


Figure 7-5. Remote (AQX) Paddle Board PWA, 9LJT (Sheet 2 of 5)

CONTROL DATA | | 3 | DN | 96720466 | A

NON - COMPONENT SIDE

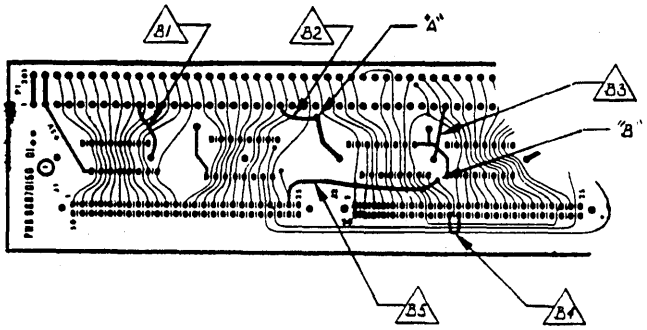


A CUT CLAD AS SHOWN

3. AT P1 - 250
4. BETWEEN J3 - 6 AND Z9 - 7
5. BETWEEN J3 - 23 AND Z13 - 5
6. BETWEEN J4 - 1 AND Z13 - 7
7. AT Z12 - 2
8. BETWEEN J3 - 24 AND Z13 - 7

CONTROL DATA | DATA SYSTEMS LA JOLLA DIVISION LA JOLLA CA 92... | 4 | DN | 96720466 | A

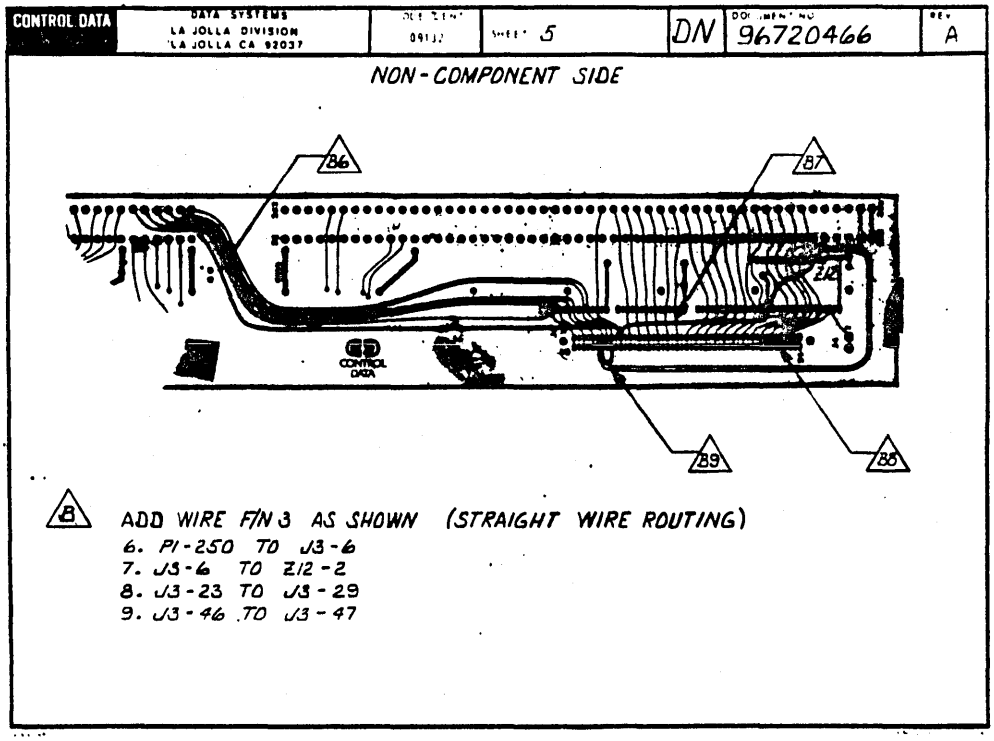
NON - COMPONENT SIDE



B ADD WIRE F/N 3 AS SHOWN (STRAIGHT WIRE ROUTING)

1. P1 - 10 TO BUS BAR LEAD AS SHOWN
2. P1 - 22 TO FEED THRU "A"
3. P1 - 36 TO BUS BAR LEAD AS SHOWN
4. J2 - 39 TO J2 - 40
5. J1 - 24 TO FEED THRU "B"

Figure 7-5. Remote (AQX) Paddle Board PWA, 9LJT (Sheet 3 of 5)



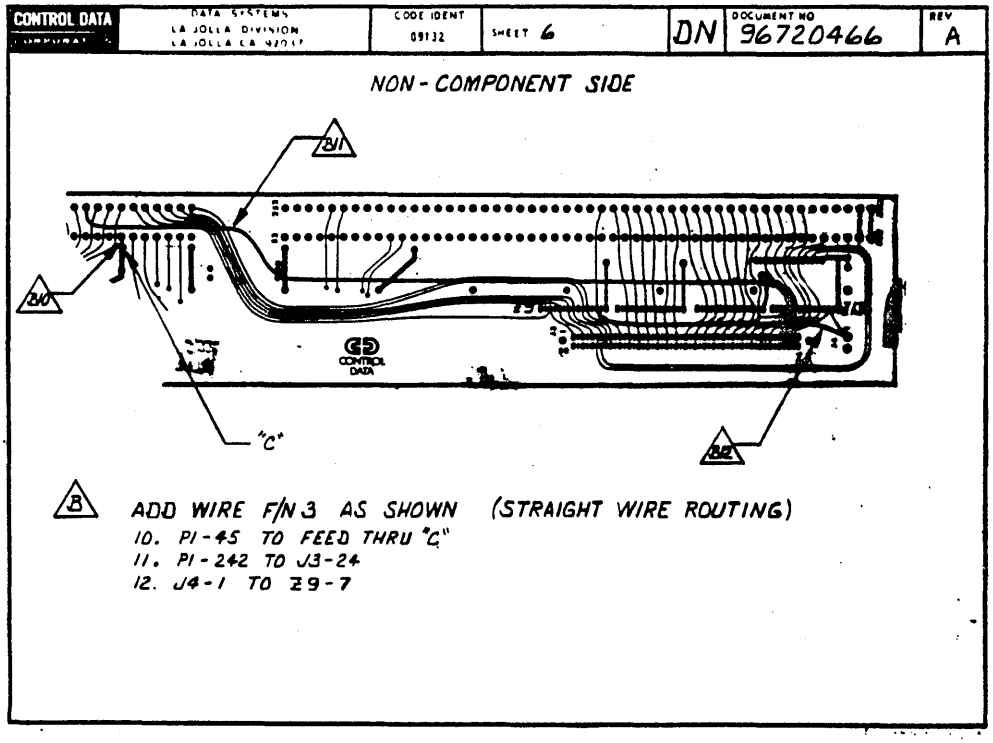


Figure 7-5. Remote (AQX) Paddle Board PWA, 9LJT (Sheet 4 of 5)

PWA - AQ EXTENDER REMOTE - PADDLE BRD 9LJT | PL | 96720466 | B

CYBER 18 | SHEET 1 OF 2

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	AS217/9	CL. B PRE-RELEASED	[illegible]	[illegible]	[illegible]	[illegible]
A	[illegible]	CL. A RELEASED	[illegible]	1-9-81	[illegible]	[illegible]
B	D822080	ADDED F/N 13	[illegible]	3-17-81	[illegible]	[illegible]

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all using divisions per CDC-STD [illegible].

DETACHED LISTS

CONTROL DATA CORPORATION ASSEMBLY PARTS LIST

SHT. 2

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96720466	B	A	C	PWA-A/Q EXT REMOTE PDL BD 9LJT	DSM	CBR 18	01/27/80	022080	03/17/81	[illegible]

FIND NUMBER	REV	PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE			
1	A	39452200	8.00	PC	RES NETWORK-VOLTAGE DIVIDR-SIP	IN			PPP4		N
2	A	39993606	3.00	PC	CONN,HEADER,RIGHT ANGLE (2X25)	IN			PPP4		N
3	C	52629949	32.00	IN	WIRE ELEC 30 GA WHITE	IN			PPP1		N
13	A	62019900	0.00	OZ	EPOXY, 2 PART 5 MIN(CLEAR)TUBE	IN	022080	06[illegible]81	RFE4		N
4	D	88875500	1.00	PC	BUS BAR (13 IN)	IN			PPP4		N
5	A	88924706	5.00	PC	RES NETWORK-SIP,8 PIN,1.K OHM	IN			PPP4		N
6	A	89636137	3.00	PC	CAP FXD CER .01MFD 100VDCW	IN			PPP4		N
7	C	96720467	REF	PC	SCHEMATIC-A/Q EXP REMOTE BD	IN			RFE4		N
8	A	96751917	2.00	PC	CONNECTOR-PWB .125 CTR 18 POS	IN			PPP4		N
9	A	96752033	1.00	PC	CONN,HEADER-RT ANG(LOW- 1 POS)	IN			PYM4		N
10	A	96752036	1.00	PC	CONN,HEADER-RT ANG(UPPR- 1 POS	IN			PYM4		N
11	A	96756701	4.00	PC	CONNECTOR-PWB .125 CENTERS	IN			PPP4		N
12	C	96870150	1.00	PC	PWB-A/Q EXT REMOTE PADDLE BD	IN			PPP4		N

NUMBER OF LINE ITEMS = 13
HIGHEST FIND NUMBER = 13

SCHD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-5. Remote (AQX) Paddle Board PWA, 9LJT (Sheet 5 of 5)

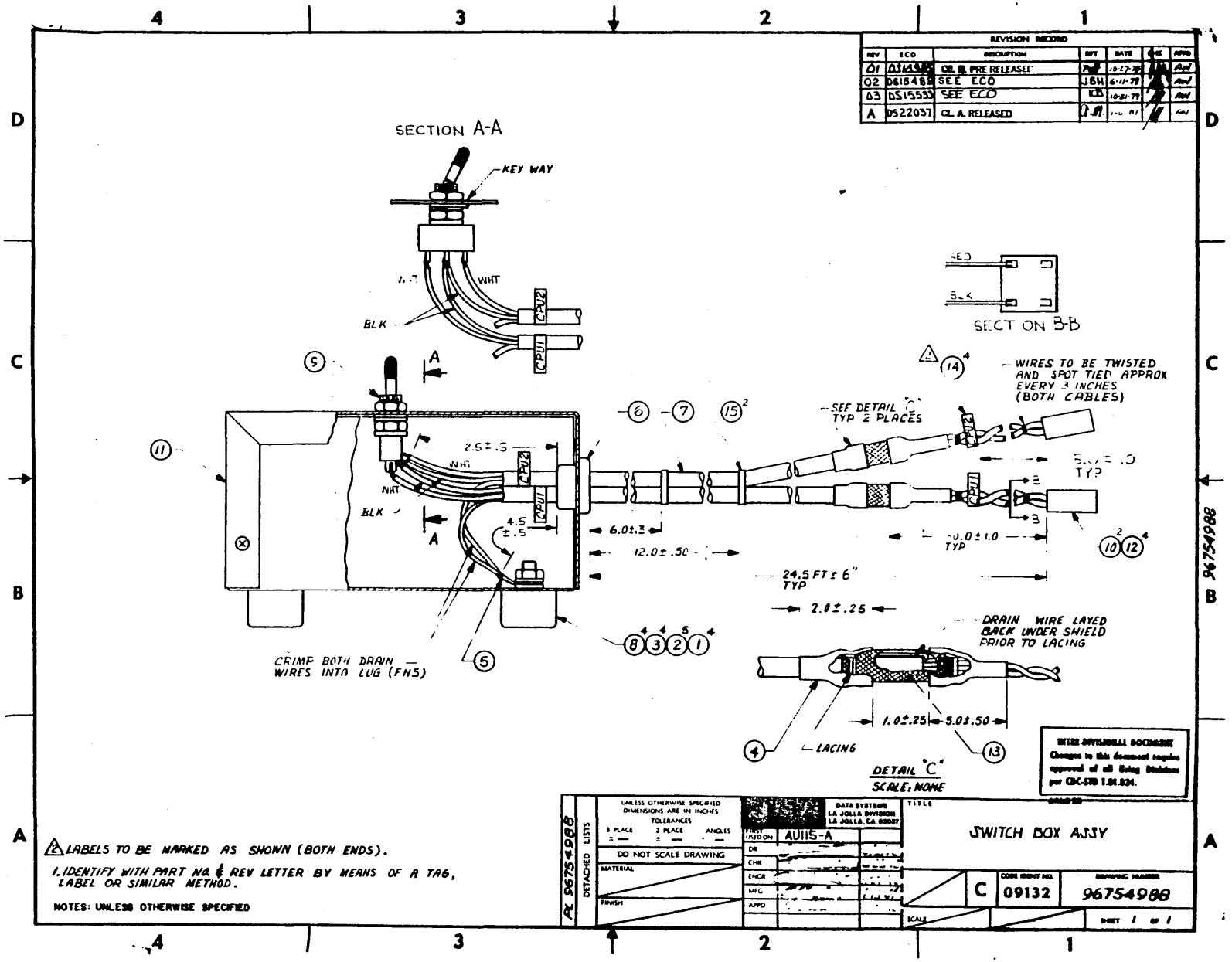


Figure 7-6. Dual Access Switch Box (Sheet 1 of 2)

TITLE	PREFIX	DOCUMENT NO.	REV.
SWITCH BOX ASSY	PL	96754988	A
FIRST USED ON: AU115-A		SHEET 1 OF 2	

[redacted] CODE IDENT 89132

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS[illegible]	CL. B. PRE-RELEASED	[illegible]	10-27-78	[illegible]	AW
02	DS16489	SEE ECO	JBH	6-1-79	[illegible]	AW
03	DS15533	SEE ECO	KB	10-31-79	[illegible]	AW
A	DS22037	CL. A. RELEASED	[illegible]	1-6-81	[illegible]	AW

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.004.

NOTES:

DETACHED LISTS

AA8199 REV 8-71 PRINTED IN U.S.A.

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 2

ASSEMBLY NUMBER	REV	CL	DW SZ	ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96754988	A	A	C	SWITCH BOX ASSY	GSD	AU115A	10/25/78	022037	12/05/80	~~1 1~~ MF

FIND NUMBER	DW SZ	PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/BUY PART TYPE	PC NC	S
1	A	10125103	4.00	PC	HEXAGON MACHINE SCREW NUTS	IN			PPP1		N
2	A	10126400	5.00	PC	EXTERNAL TOOTH LOCK WASHERS	IN			PPP1		N
3	A	10127102	4.00	PC	SCR MACH PAN PHL 4-40	IN			PPP1		N
13	C	24534806	6.00	IN	SHIELD, ELECT, BRAIDED-BULK	IN			PPP4		N
4	A	25196920	16.00	IN	INSUL SLEEVE SHRINK 3/8 BLACK	IN			PPP3		N
5	A	25196601	1.00	PC	TERM,RING 16-22AWG NO. 3/4STUD	IN			PPP4		N
6	A	36156910	1.00	PC	BUSHING STRAIN RELIEF	IN	015533	102979	PPP4		N
7	A	36810900	600.00	IN	WIRE,TW/PR,SHIELD	IN			PPP4		N
~~[illegible]~~	~~A~~	~~[illegible]~~	~~1.00~~	~~PC~~	~~[illegible]~~	~~OUT~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~		
8	A	39050209	4.00	PC	BUMPER, RUBBER-RECESSED BLK	IN			PPP4		N
14	A	39397105	4.00	PC	LABEL,WRITE ON	IN			PPP3		N
9	A	39481301	1.00	PC	SWITCH,TOGGLE,LOCKING LEVER	IN			PPP4		N
12	C	94245602	4.00	PC	CONTACT-CRIMP INSERT SOCKET	IN	015533	102979	PPP4		N
~~12~~	~~C~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~CONTACT-CRIMP INSERT SOCKET~~	~~OUT~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~		
15	C	94277601	2.00	PC	STRAP CABLE TIE	IN			PPP3		N
10	C	94361111	2.00	PC	HOUSING CONN .100 4 CAVITY	IN	015469	052979	PPP4		N
~~10~~	~~C~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~HOUSING CONN .100 [illegible] CAVITY~~	~~OUT~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~		
11	C	96754989	1.00	PC	SWITCH BOX MODIFICATION	IN			PPE4		N

NUMBER OF LINE ITEMS = 14
HIGHEST FIND NUMBER = 15

SCMD ENG INFO INTERDIVISIONAL DOCUMENT

Figure 7-6. Dual Access Switch Box (Sheet 2 of 2)

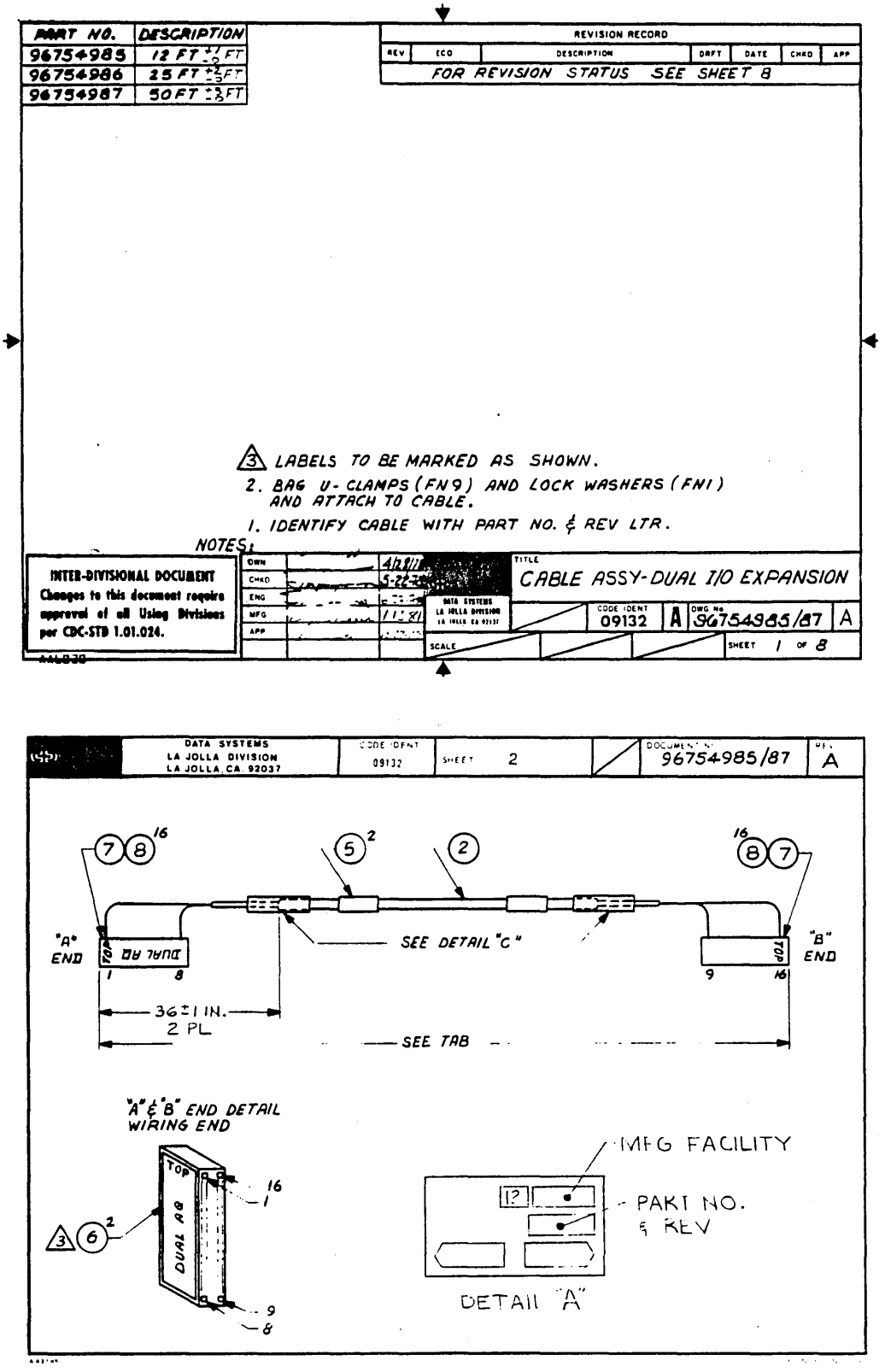
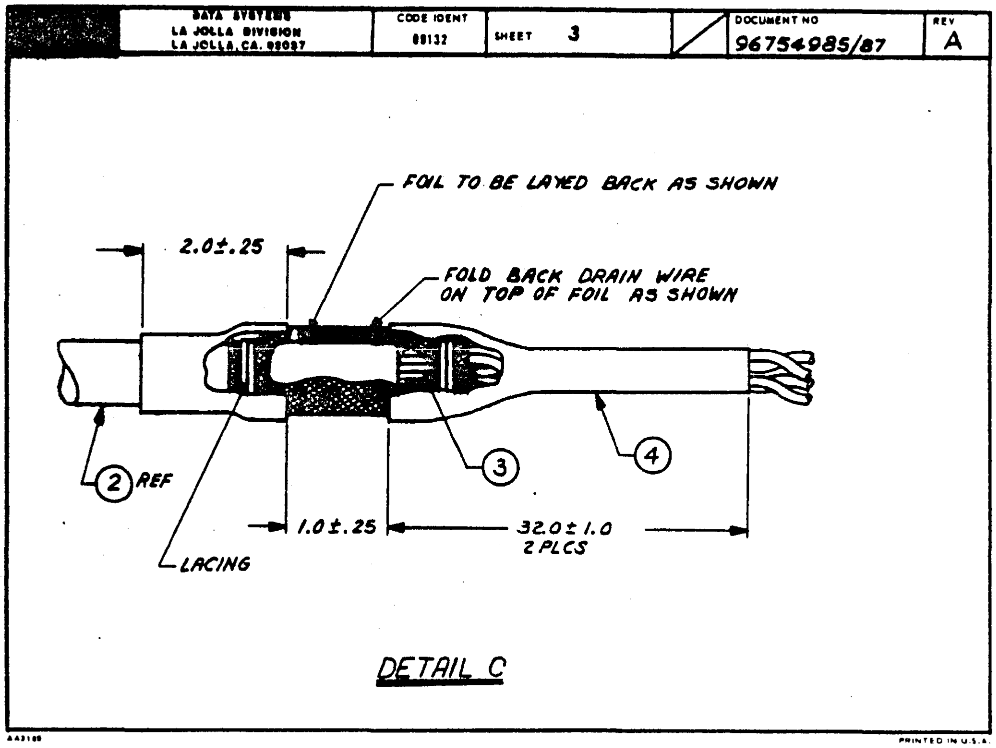


Figure 7-7. Dual I/O Expansion Cable (Sheet 1 of 4)



CONTROL DATA CORPORATION ASSEMBLY PARTS LIST

SH 4

Assembly Number	Rev			Assembly Description		First Usage	Release Date	Change Ord. Number	Processing Date	Page Number
96754985	A	A	A	CABLE ASSY-DUAL I/O EXPN 12FT	DS	AU115A	10/25/79	022037	12/05/80	~~1/1~~ MF

Find Number		Part Number	Quantity	Unit Meas.	Part Description	In/Out Status	Change Ord. Number	Date Effective	Make/Buy Part Type		
1	A	10125806	4.00	PC	SPRING LOCK WASHERS (MED.)	IN			PPP1		N
3	C	24534807	3.00	IN	SHIELD, ELECT. BRAIDED-BULK	IN			PPP4		N
4	A	25196921	70.00	IN	INSUL SLEEVE SHRINK 1/2 BLACK	IN	021647	100279	PPP3		N
5	B	39296400	2.00	PC	LABEL, CABLE MARKING	IN			PPP4		N
6	A	39397100	2.00	PC	LABEL,WRITE ON	IN			PPP3		N
8	C	94245609	32.00	PC	CONTACT-CRIMP,INSERT,SOCKET	IN			PPP4		N
7	C	94361106	2.00	PC	HOUSING CONN .100 16 CAVITY	IN			PPP4		N
2	A	96753576	146.00	IN	CABLE,24AWG,8 TW/PR,SHIELDED	IN			PPP4		N
9	A	94785700	2.00	PC	CLAMP,U-TYPE .75 GAPX1.25	IN			PPP4		N
					NUMBER OF LINE ITEMS =						
					HIGHEST FIND NUMBER =						

SC4A MFG INFO

PRINTED IN U.S.A.

Figure 7-7. Dual I/O Expansion Cable (Sheet 2 of 4)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 5

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96754986	A	A	A	CABLE ASSY-DUAL I/O EXPN 25FT	DS	AU1154	10/25/79	022037	12/05/80	~~1/1~~ MF

FIND NUMBER		PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/OUT PART TYPE		
1	A	10125806	4.00	PC	SPRING LOCK WASHERS (MED.)	IN			PPP1		N
3	C	24534807	3.00	IN	SHIELD, ELECT, BRAIDED-BULK	IN			PPP4		N
4	A	25196921	70.00	IN	INSUL SLEEVE SHRINK 1/2 BLACK	IN	021637	100279	PPP3		N
5	B	39296400	2.00	PC	LABEL, CABLE MARKING	IN			PPP4		N
6	A	39397100	2.00	PC	LABEL, WRITE ON	IN			PPP3		N
8	C	94245609	32.00	PC	CONTACT-CRIMP,INSERT,SOCKET	IN			PPP4		N
7	C	94361106	2.00	PC	HOUSING CONN .100 16 CAVITY	IN			PPP4		N
2	A	96753576	300.00	IN	CABLE,24AWG,B TW/PR,SHIELDED	IN			PPP4		N
9	A	96785700	2.00	PC	CLAMP,U-TYPE .75 GAPX1.25	IN			PPP4		N

NUMBER OF LINE ITEMS = 9
HIGHEST FIND NUMBER = 9

SCMO MFG INFO

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 6

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96754987	A	A	A	CABLE ASSY-DUAL I/O EXPN 50FT	DSM	AU1154	10/25/79	022037	12/05/80	~~1/1~~ MI

FIND NUMBER		PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/OUT PART TYPE		
1	A	10125806	4.00	PC	SPRING LOCK WASHERS (MED.)	IN			PPP1		N
3	C	24534807	3.00	IN	SHIELD, ELECT, BRAIDED-BULK	IN			PPP4		N
4	A	25196921	70.00	IN	INSUL SLEEVE SHRINK 1/2 BLACK	IN	021637	100279	PPP3		N
5	B	39296400	2.00	PC	LABEL, CABLE MARKING	IN			PPP4		N
6	A	39397100	2.00	PC	LABEL, WRITE ON	IN			PPP3		N
8	C	94245609	32.00	PC	CONTACT-CRIMP,INSERT,SOCKET	IN			PPP4		N
7	C	94361106	2.00	PC	HOUSING CONN .100 16 CAVITY	IN			PPP4		N
2	A	96753576	600.00	IN	CABLE,24AWG,B TW/PR,SHIELDED	IN			PPP4		N
9	A	96785700	2.00	PC	CLAMP,U-TYPE .75 GAPX1.25	IN			PPP4		N

NUMBER OF LINE ITEMS = 9
HIGHEST FIND NUMBER = 9

SCMO MFG INFO

Figure 7-7. Dual I/O Expansion Cable (Sheet 3 of 4)

DATA SYSTEMS
LA JOLLA DIVISION
LA JOLLA, CA 92037

CODE IDENT 09132 | SHEET 7 | WL | DOCUMENT NO 96754985/87 | REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS
1	2	24	BRN	TW PR	A END	A1	8	B END	B8	8	RQST IN / RQST OUT
2	↑	↑	BLK		↑	A16	↑	↑	B9	↑	GND
3			RED			A2			B7		ALT DEMAND / DEMAND OUT
4			BLK			A15			B10		GND
5			ORN			A3			B5		ALCNCT IN / CNCT OUT
6			BLK			A14			B12		GND
7			YEL	SEE TAB		A4			B6		ALORIDE IN / OVRRIDE OUT
8			BLK			A13			B11		GND
9			GRN			A5			B3		CNCT OUT / ALCNCT IN
10			BLK			A12			B14		GND
11			BLU			A6			B4		OVRRIDE OUT / ALORIDE IN
12			BLK			A11			B13		GND
13			RED			A7			B2		DEMAND OUT / ALT DEMAND
14			WHT			A10			B15		GND
15	↓	↓	BLK		↓	A8	↓	↓	B1	↓	RQST OUT / RQST IN
16	2	24	WHT		A END	A9	8	B END	B16	8	GND

AA3163 REV. 8-71 PRINTED IN U.S.A.

DWN
CHKD
ENG
MFG
APPD

DATA SYSTEMS LA JOLLA DIVISION
CODE IDENT 09132

TITLE CABLE ASSY-DUAL I/O EXPN. | PREFIX | DOCUMENT NO. 96754985/87 | REV. A

FIRST USED ON AU115-A | SHEET 8

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS18925	CL. B. PRE-RELEASED	TVH	10-27-78		AW
02	DS21637	CHG'D LENGTH OF SHRINK TUBING	TVH	10-12-79		AW
A	DS22037	CL. A. RELEASED	Q. A.	1-6-81		AW

NOTES:

DETACHED LISTS

AA8188 REV. 8/71 PRINTED IN U.S.A.

Figure 7-7. Dual I/O Expansion Cable (Sheet 4 of 4)

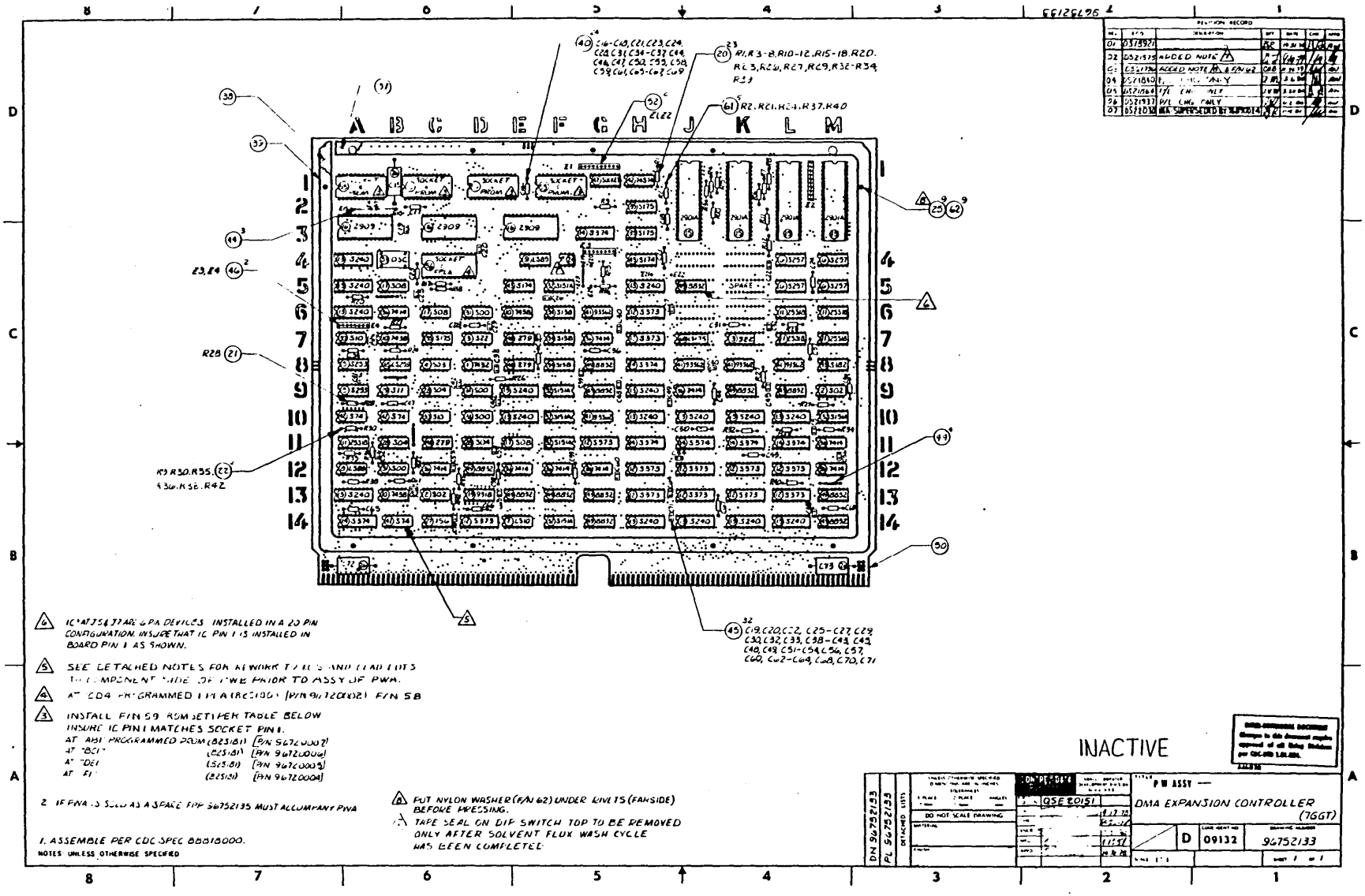


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 1 of 14)

DWN / CHKD / ENG / MFG / APPR — CODE IDENT 09132	TITLE PWA-DMA EXPANSION CONTROLLER (7GGT)	PREFIX DN	DOCUMENT NO. 96752133 — REV. 07
	FIRST USED ON QSE 20151		SHEET 1 OF 22

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS 18921	CL. B. PRE-RELEASED	BA	11-21-78		AKJ
07	DS22030	INA-SUPERSEDED BY 96890024		1-17-81		AW

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.024.

AA6030

NOTES

INACTIVE

DETACHED LISTS

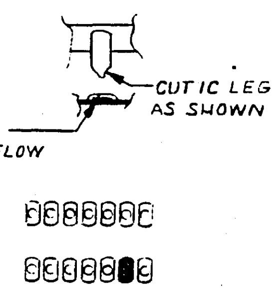
AA8100 REV. 8-71 PRINTED IN U.S.A.

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 2	DN	DOCUMENT NO. 96752133 — REV. 01

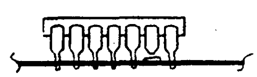
A CUT CLAD WHERE SHOWN: (COMPONENT SIDE)
1. BETWEEN FEED THRU "A" AND J1/2-12
2. BETWEEN M9-2 AND M9-5
3. BETWEEN D10-6 AND FEED THRU "D"
4. BETWEEN CD3-23 AND EF3-24
5. BETWEEN A14-1 AND FEED THRU "E"
6. BETWEEN B12-11 AND L6-7
7. M9-6

B (NON-COMPONENT SIDE)
1. H4-7
2. C12-2
3. BETWEEN E7-5 AND FEED THRU "G"
4. BETWEEN C9-10 AND FEED THRU "C"
5. E10-13
6. A1-9 BOTH SIDES
7. B12-8

C ADD WIRE (F/N 57) C1 THRU C99 TO IC COMPONENT LEG EXCEPT AS OTHERWISE SHOWN (SHT 5-22).



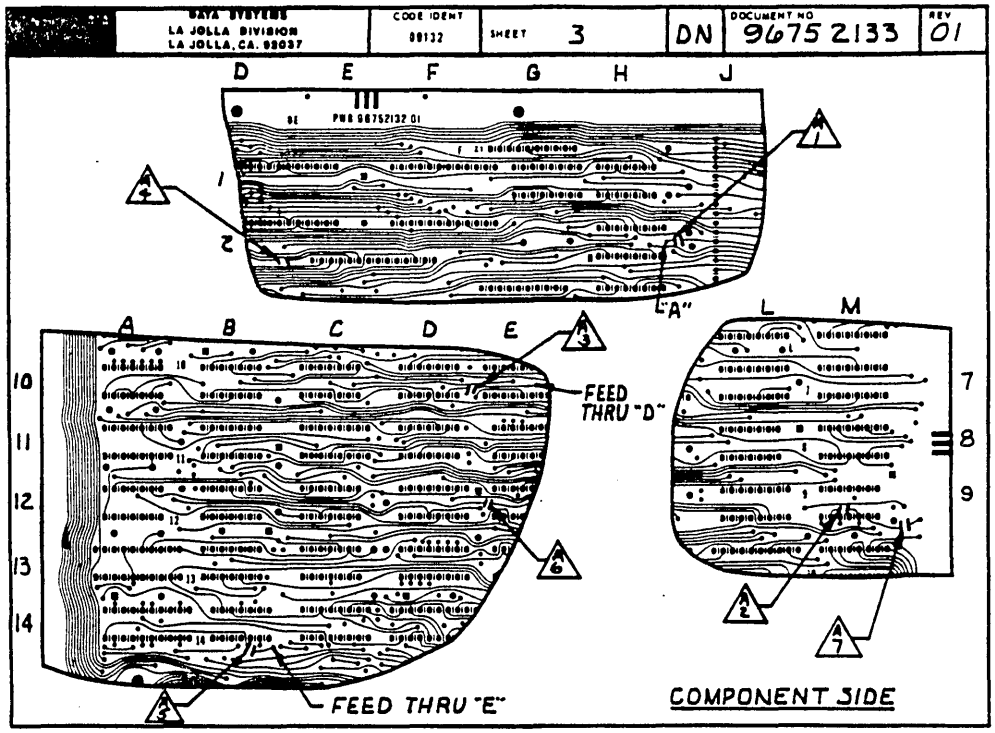
D CUT I.C. LEG AS SHOWN (SEE DETAIL "A")
1. B14-10
2. AB3-23
3. B5-8
4. CD3-23
5. A14-11
6. C13-1
7. D9-13
8. A13-12
9. B13-11 (DO NOT EPOXY THIS I.C. PAD)
10. D13-14



DETAIL "A"
TYPICAL VIEW FOR I.C. LEG MODIFICATION

AA3169 PRINTED IN U.S.A.

Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 2 of 14)



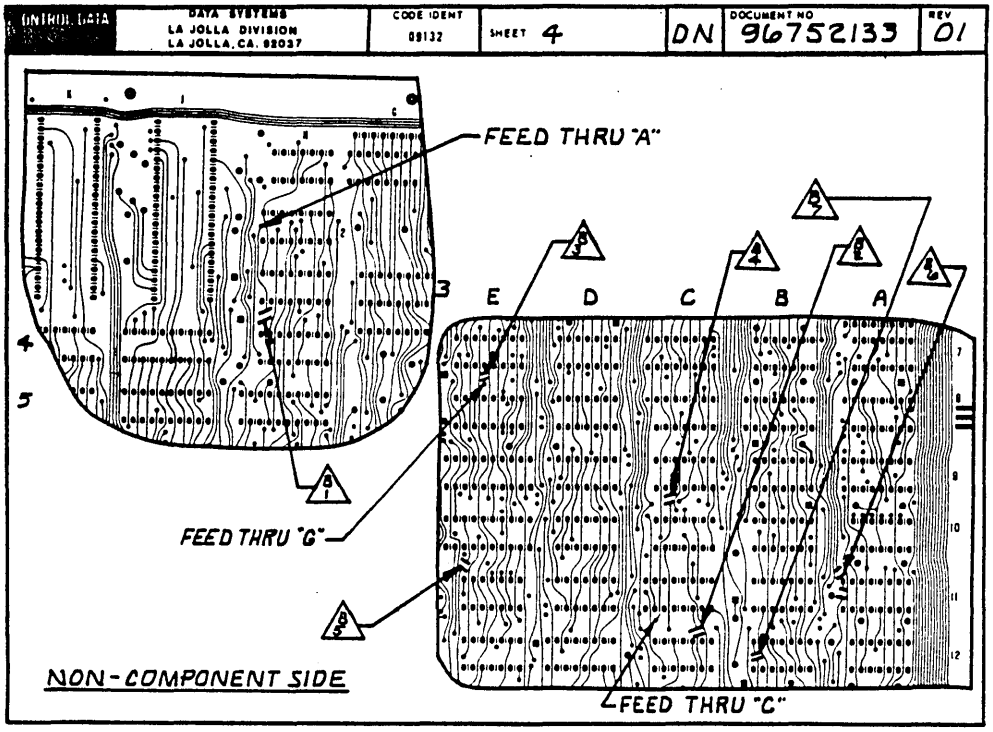
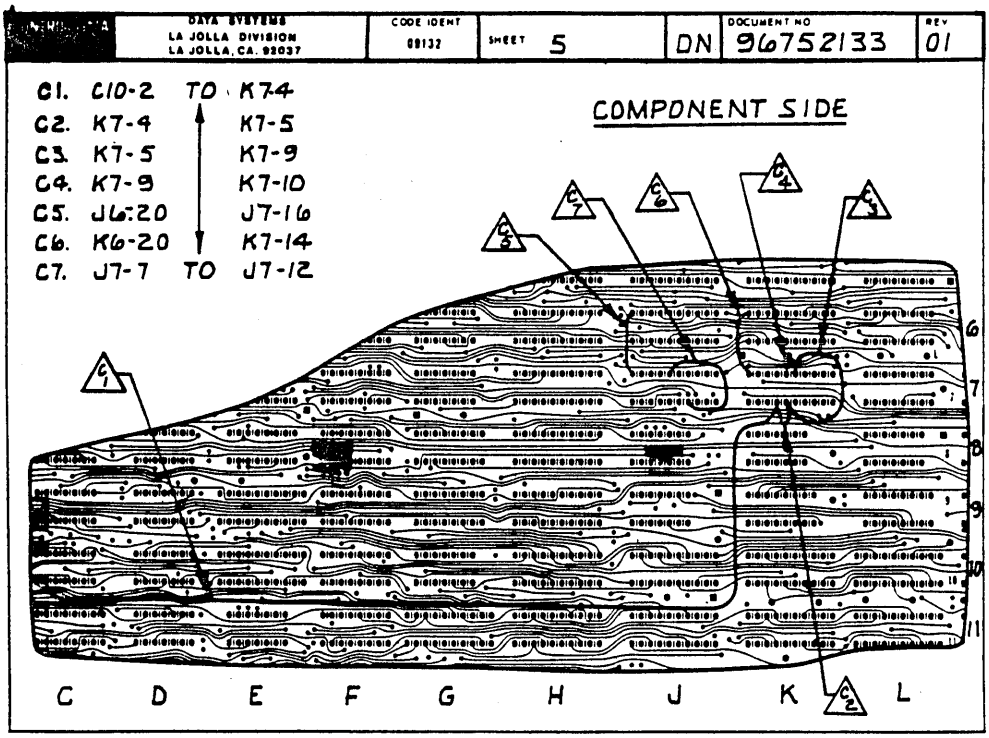


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 3 of 14)



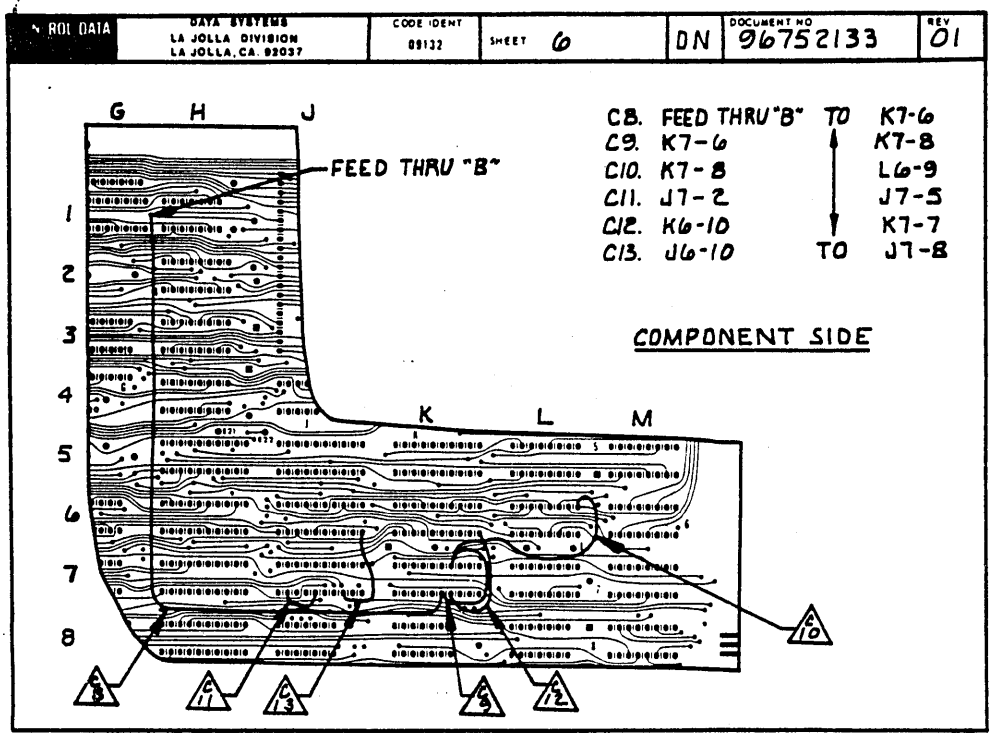
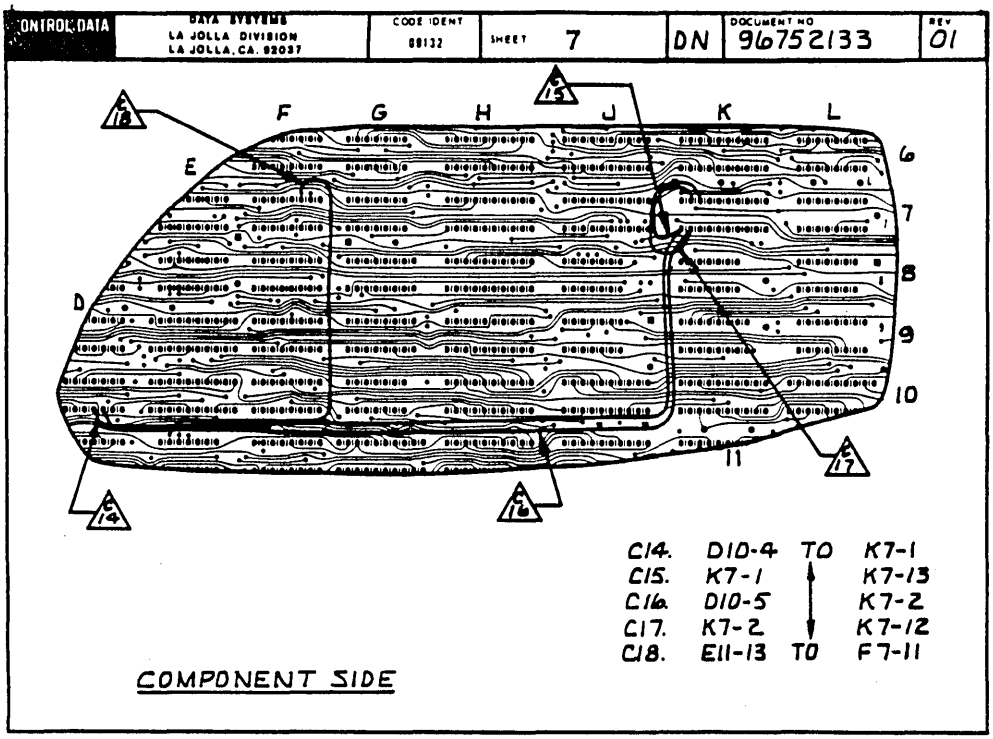


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 4 of 14)



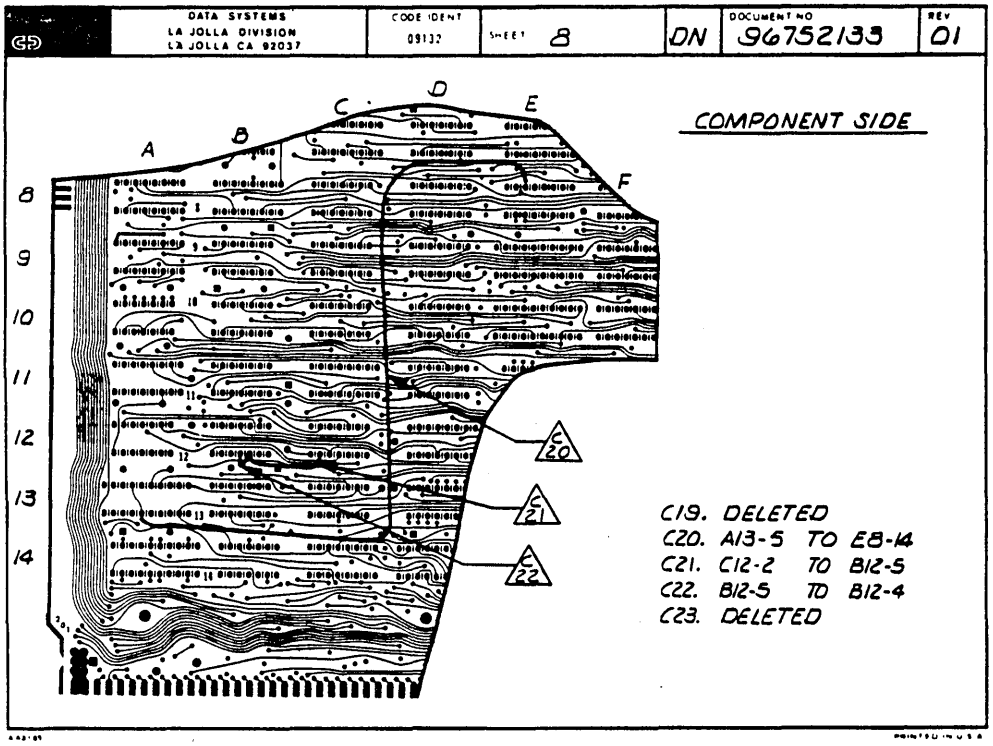
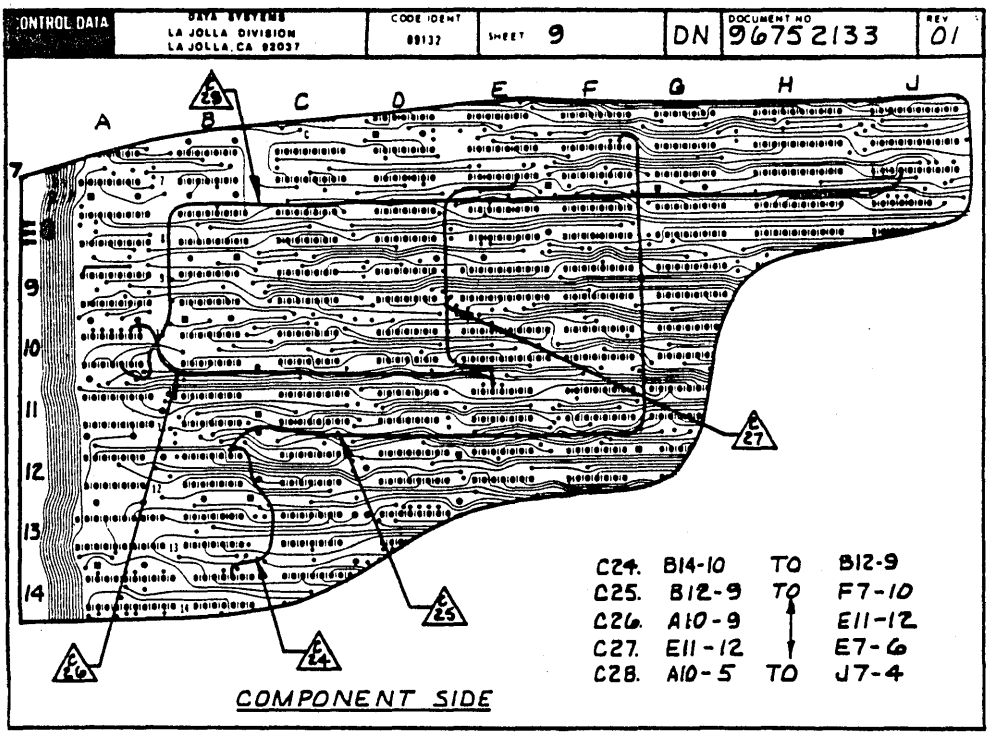


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 5 of 14)



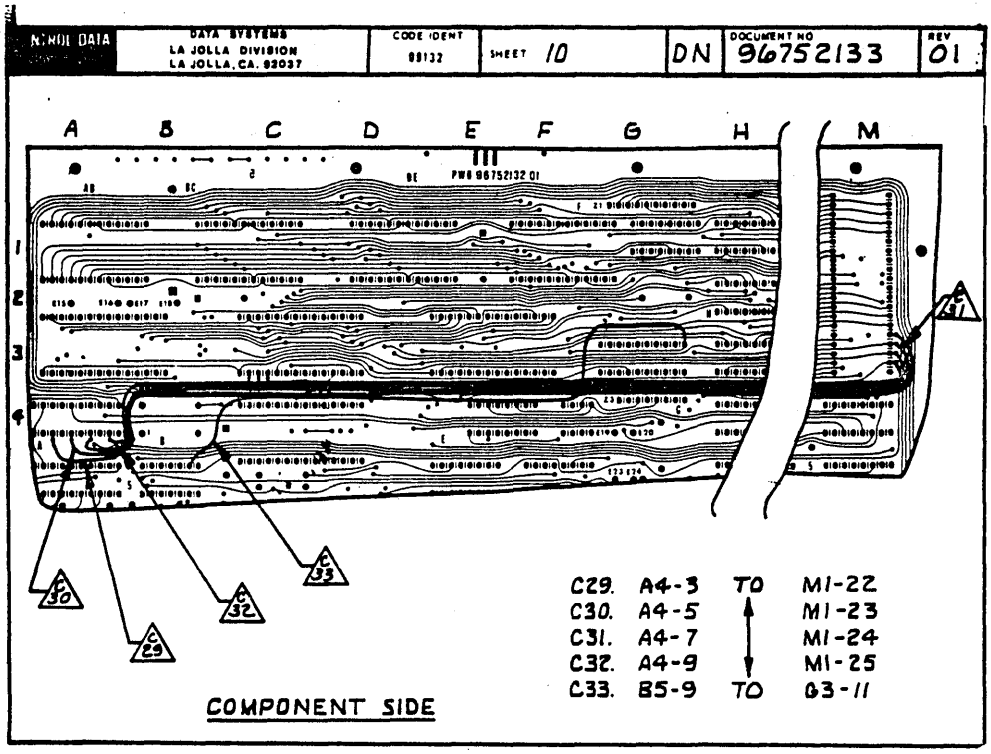
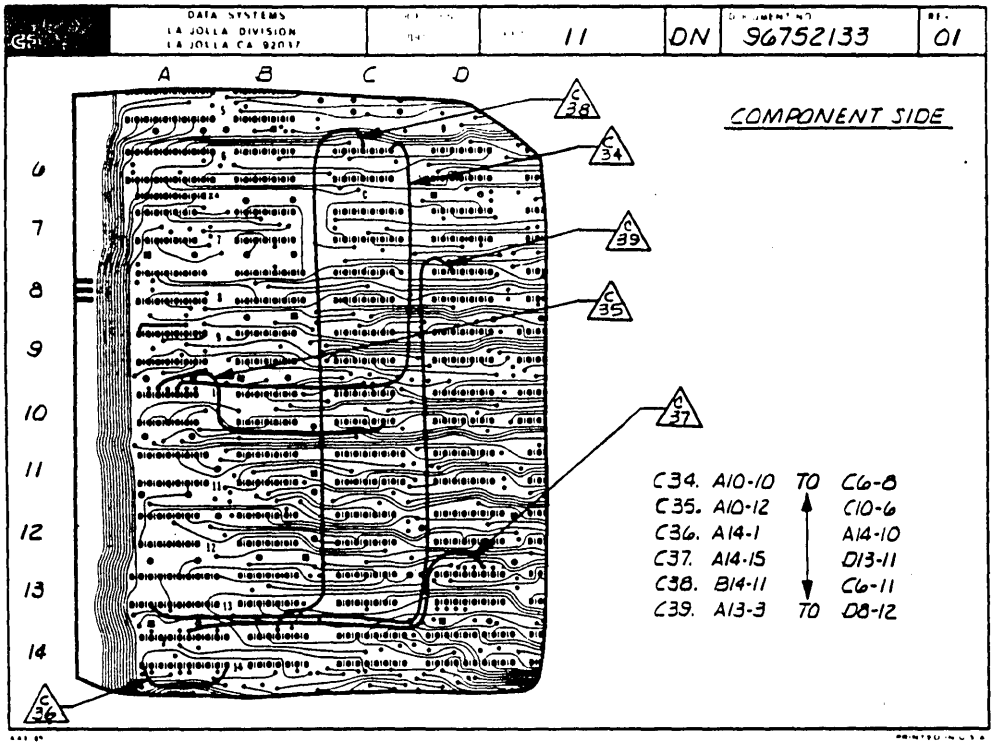


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 6 of 14)



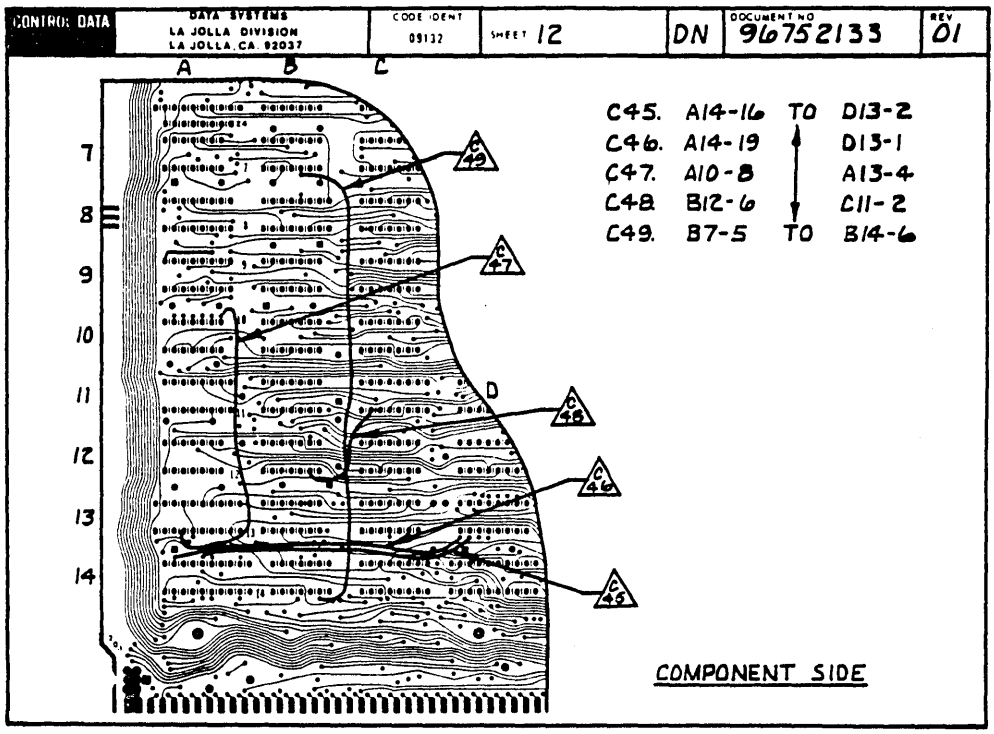
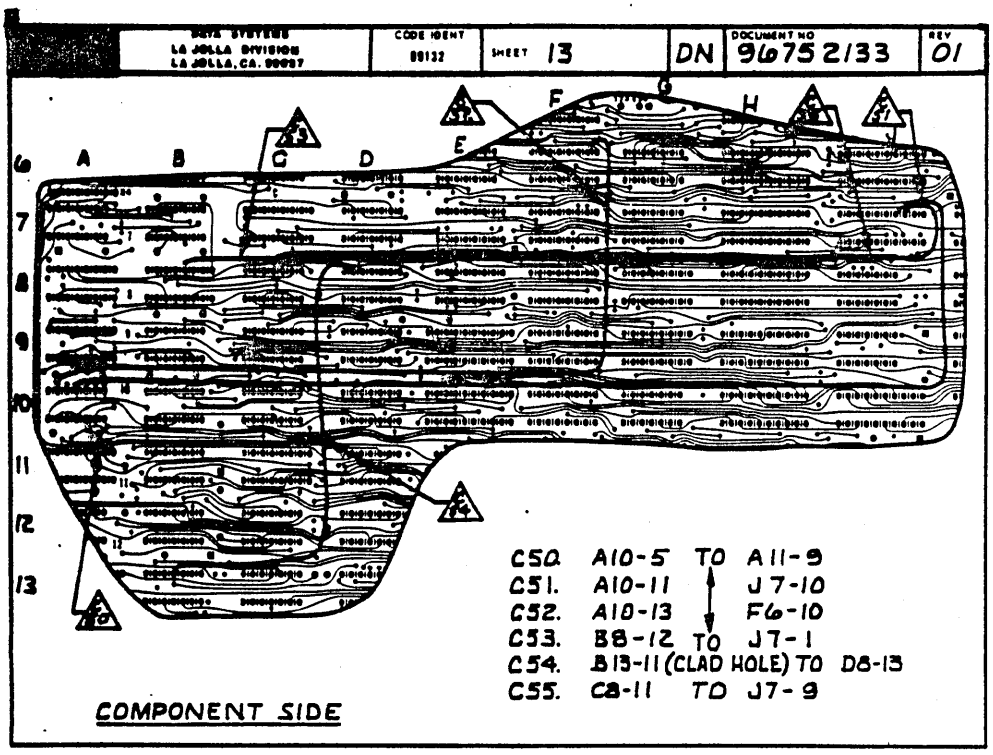


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 7 of 14)



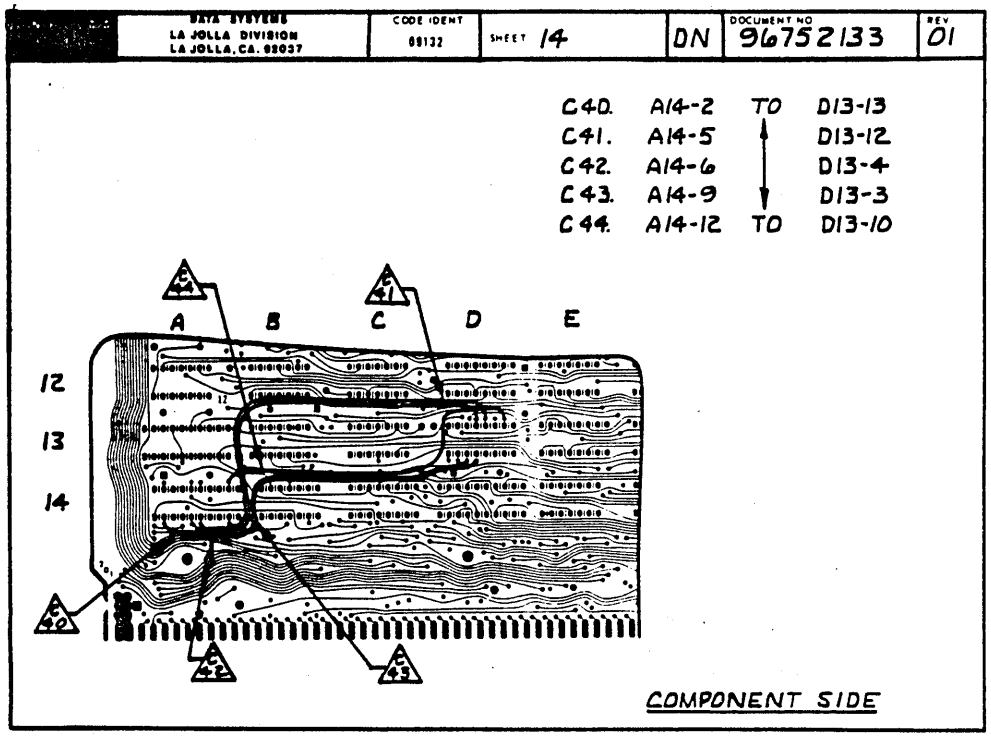
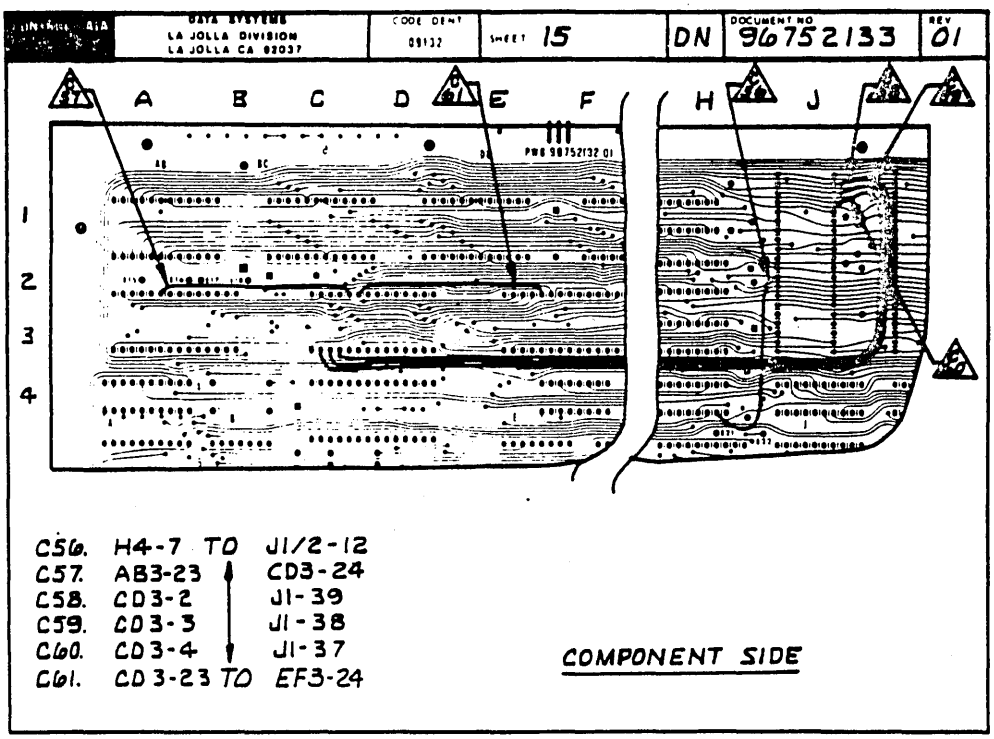


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 8 of 14)



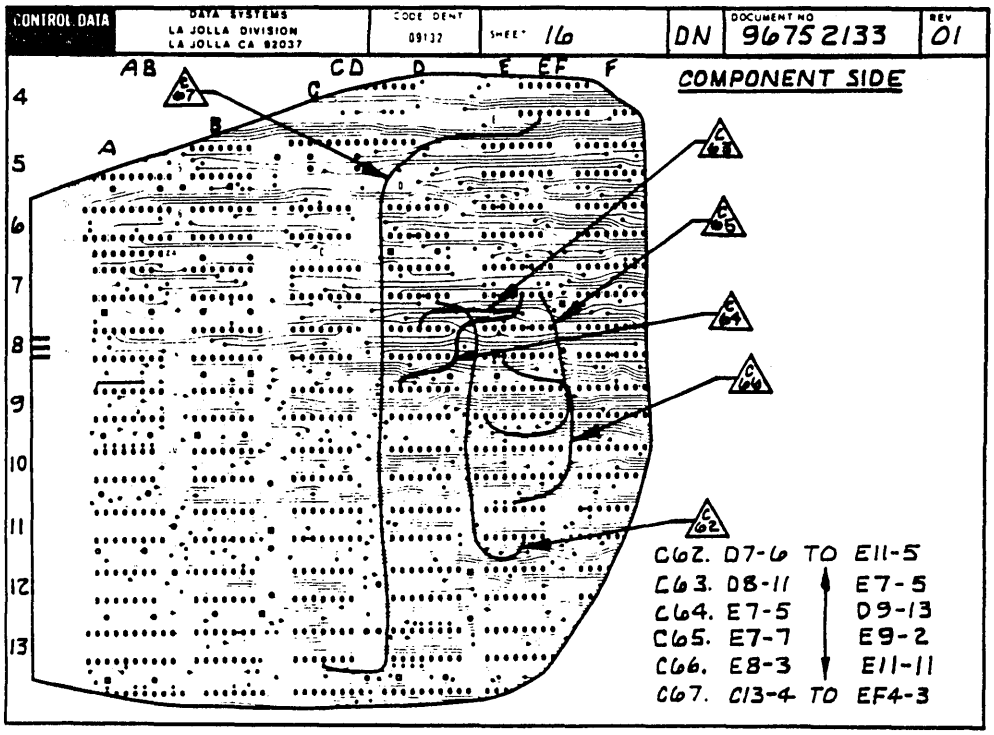
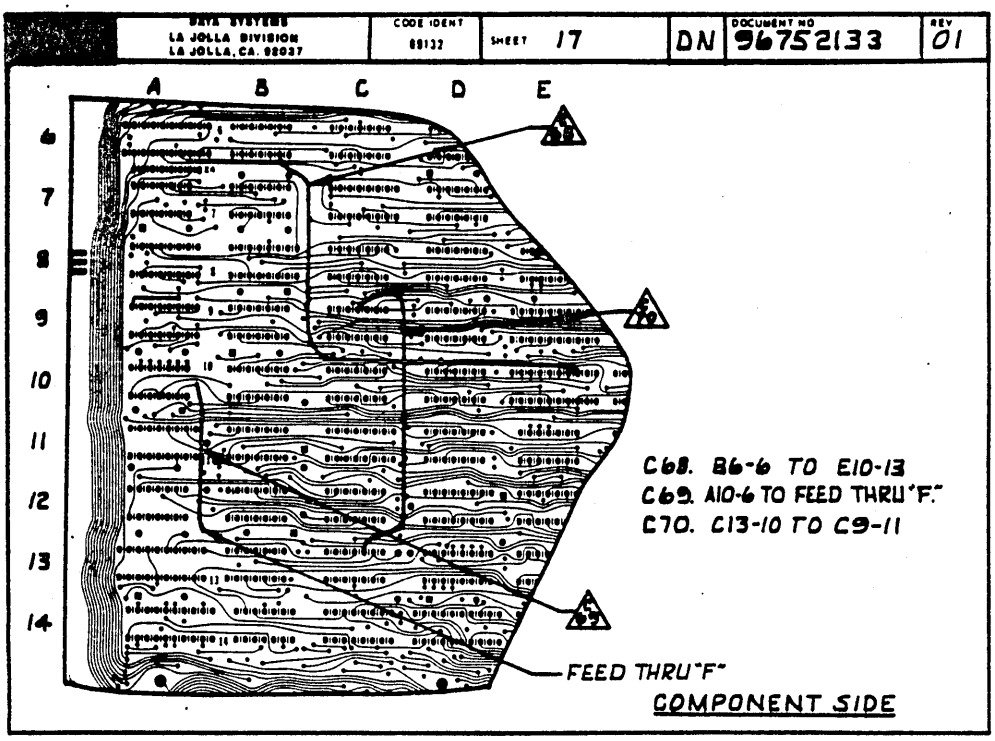


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 9 of 14)



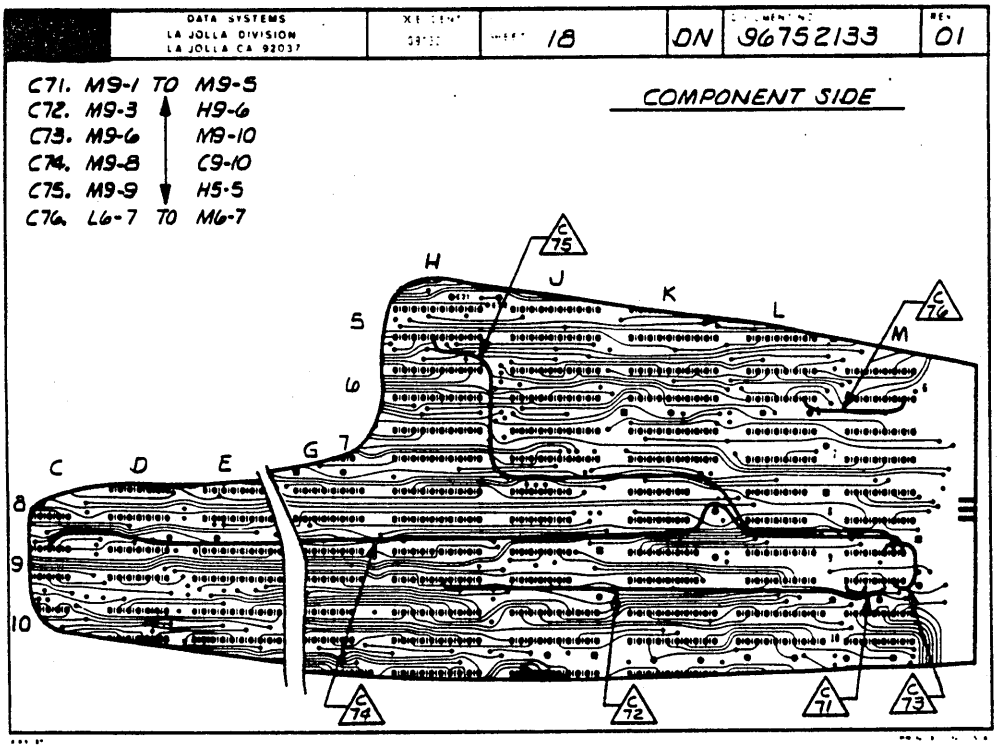


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 10 of 14)

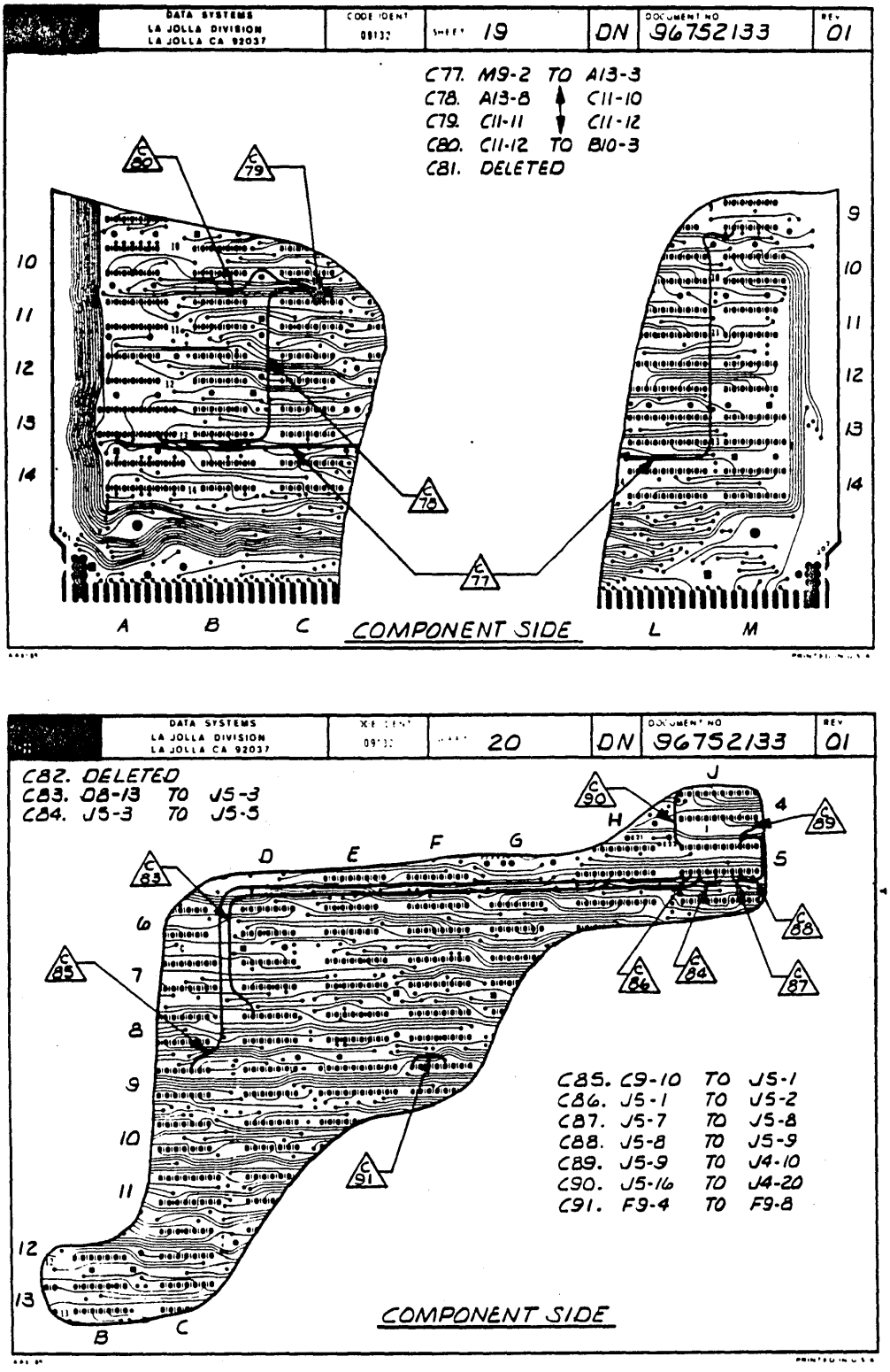
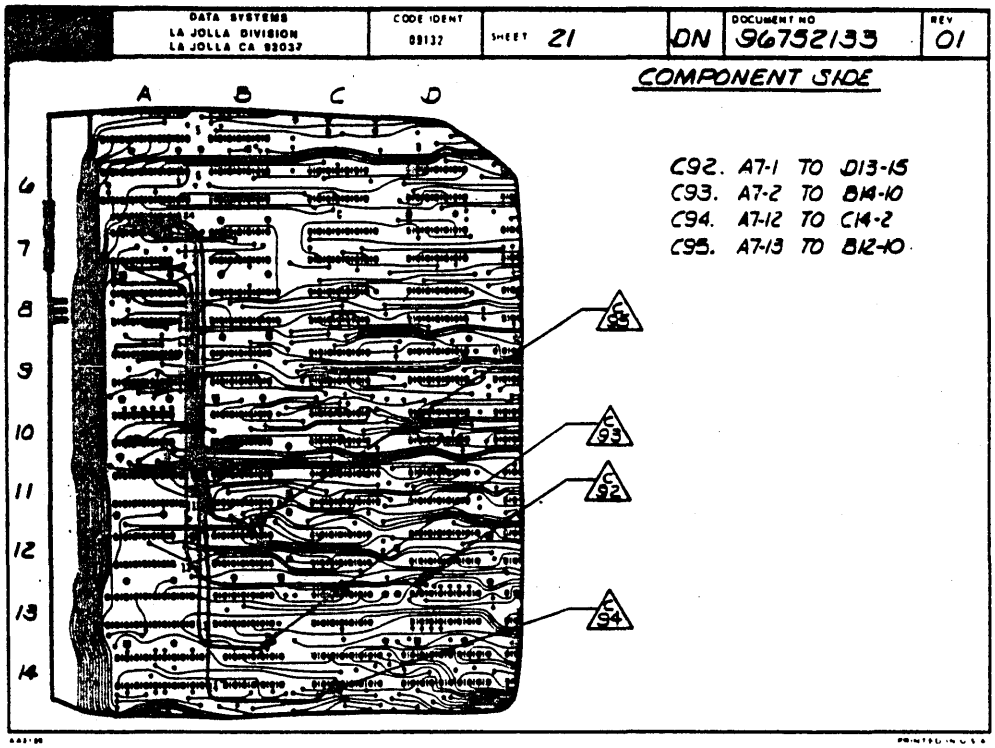


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 11 of 14)



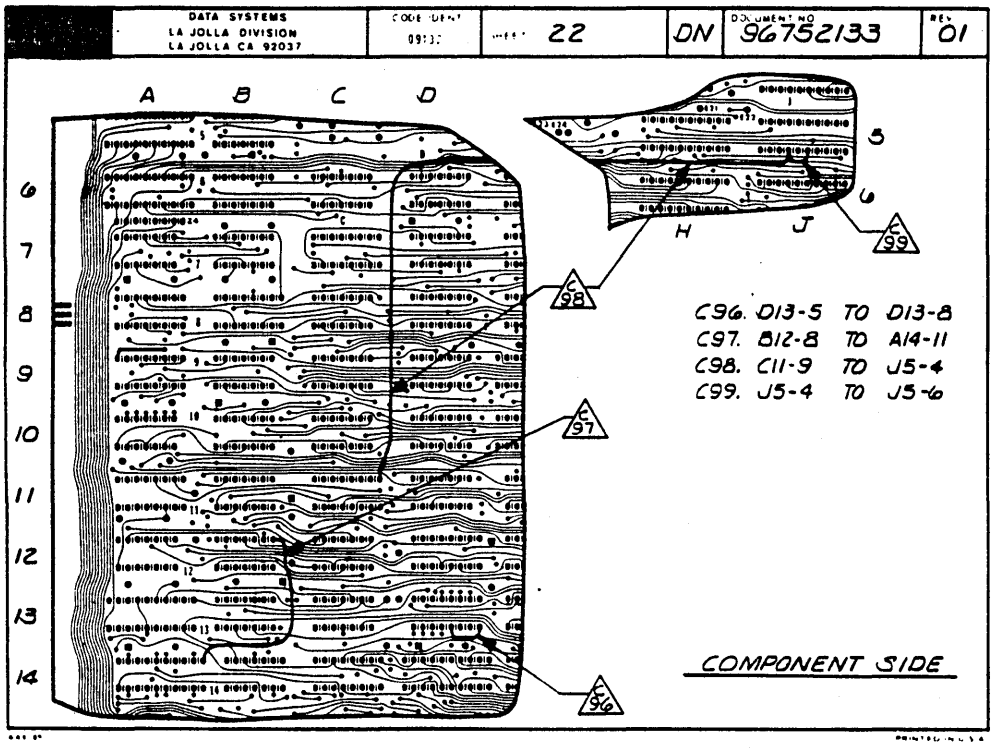


Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 12 of 14)

TITLE PWA - DMA EXPANSION CONTROLLER (7GGT) | PL | DOCUMENT NO. 96752133 | REV. 07

FIRST USED ON: QSE 20151 | SHEET 1 OF 3

CODE IDENT 89132

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS18221	CL. B. PRE-RELEASED	[illegible]	10-31-79	[illegible]	[illegible]
02	DS21575	F/N 24 WAS 39396502	[illegible]	[illegible]	[illegible]	[illegible]
03	DS21796	ADDED F/N 62	[illegible]	11-30-79	[illegible]	[illegible]
04	DS21840	F/N 2 WAS 15145000	[illegible]	3-6-80	[illegible]	[illegible]
05	DS21864	F/N50(RISK) ADDED	[illegible]	3-20-80	[illegible]	[illegible]
06	DS21937	96890180 WAS "REF"	[illegible]	6-5-80	[illegible]	[illegible]
07	DS22030	INA-SUPERSEDED BY 96890024	[illegible]	1-15-81	[illegible]	[illegible]

NOTES:

INACTIVE

DETACHED LISTS

CONTROL DATA CORPORATION ASSEMBLY PARTS LIST

SH 2

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96752133	07	I	D	PWA-DMA CONTROLLER 7GGT	DSM	8U272A	10/25/78	022030	12/31/80	1/ 2

FIND NUMBER		PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE			
57	A	15006509	500.00	IN	WIRE-ELEC W/W TEFZEL 308A WHT	IN			PPP1		N
1	A	15114700	1.00	PC	MICRO CIRCUIT 7432	IN			PPP4		N
3	C	15127300	2.00	PC	INTEGRATED CIRCUIT	IN			PPP4		N
5	A	15144200	2.00	PC	IC 74S253 MUX, DUAL 4-IN	IN			PPP4		N
6	A	15144300	4.00	PC	IC-74S257 TTL QUAD 2-INPUT MUX	IN			PPP4		N
~~2~~	~~A~~	~~15145000~~	~~3.00~~	~~PC~~	~~IC-TTL QUAD 2-INPUT NOR 74LS02~~	~~OUT~~	~~021840~~	~~03[illegible]~~	~~PPP4~~		~~N~~
7	A	15145600	1.00	PC	IC TTL TRPL 3INPUT NAND 74LS10	IN			PPP4		N
8	A	15146400	1.00	PC	IC TTL QUAD 2INPUT EXC 74LS86	IN			PPP4		N
60	A	15146900	1.00	PC	IC-TTL,LATCH 4 BIT 74LS175	IN			PPP4		N
9	A	15147200	1.00	PC	IC-74LS85 TTL 4 BIT COMPARATOR	IN			PPP4		N
10	A	15158300	3.00	PC	I C 7438	IN			PPP4		N
2	A	15158500	2.00	PC	IC-TTL QUAD 2 INPUT NOR 74S02	IN	021840	038380	PPP4		N
4	A	15161500	1.00	PC	IC 74S03	IN			PPP4		N
11	A	15162700	5.00	PC	IC 25S18 QUAD D. REGISTER, TTL	IN			PPP4		N
12	A	15162800	12.00	PC	IC-OCTAL LATCH,TTL 74S373	IN			PPP4		N
13	A	15163218	16.00	PC	IC 74S240	IN			PPP4		N
14	A	15163310	7.00	PC	IC 74S374 OCTAL LATCH TTL	IN			PPP4		N
15	A	15163316	4.00	PC	IC-2901A MICROPROCESSOR,4 BIT	IN			PPP4		N
16		15163317	3.00	PC	I.C.2909	IN			PPP4		N
17	A	15163600	3.00	PC	IC 74S08	IN			PPP4		N
18	A	15164401	1.00	PC	IC-74LS259 8 BIT ADDR LATCH	IN			PPP4		N
19	A	17185500	1.00	PC	I.C.ENCODER,8BIT PRI 9318	IN			PPP4		N
61	C	24500047	5.00	PC	RES FXD .25W 220 OHMS	IN			PPP4		N
20	C	24500055	23.00	PC	RES FXD .25W 470 OHMS	IN			PPP4		N
21	C	24500063	1.00	PC	RES FXD .25W 1000 OHMS	IN			PPP4		N
22	C	24500071	6.00	PC	RES FXD .25W 2200 OHMS	IN			PPP4		N
~~24~~	~~A~~	~~[illegible]~~	~~1.00~~	~~PC~~	~~SWITCH, LOW PROFILE DIP SPST 4~~	~~OUT~~	~~021575~~	~~01[illegible]~~	~~PPP4~~		~~N~~
56	A	51858101	1.00	PC	SOCKET,IC,PC TYPE 28 PIN	IN			PPP4		N
54	A	62019900	0.03	OZ	EPOXY, 2 PART 5 MIN(CLEAR)TUBE	IN			RFE4		N
25	A	88812400	9.00	PC	RIVET-SEMI-TUBULAR,BRS .312 LG	IN			PPP4		N
26	A	88880500	3.00	PC	CAP ELECT-ALUM 16VDC 100UF	IN			PPP4		N
27	A	88881500	1.00	PC	IC 74156 TTL 2/4 L/DECOD/DEMUX	IN			PPP4		N
28	A	88883700	3.00	PC	IC 74S04 SCHOTTKY TTL HEX INV	IN			PPP4		N
29	A	88884100	1.00	PC	IC 74S11 SCHOTTKY TTL TPL 3-I	IN			PPP4		N
30	A	88884200	2.00	PC	IC 74S10 SCHOTTKY TTL 3-I NAND	IN			PPP4		N
31	A	88884500	4.00	PC	IC 74S00 SCHOTTKY TTL QUAD 2-I	IN			PPP4		N

SCMD MFG INFO INTERDIVISIONAL DOCUMENT

INACTIVE

Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 13 of 14)

CONTROL DATA CORPORATION — ASSEMBLY PARTS LIST

SH 3

96752133	07	I	D	PWA-DMA CONTROLLER 7GGT	DSN	BU272A	10/25/78	022030	12/31/80	2/ 2

32	A	88884700	6.00	PC	IC-74S151 TTL DATA SELECTR/MUX	IN			PPP4		N
33	A	88885000	1.00	PC	IC 74S182 TTL LOOK-AHEAD GEN	IN			PPP4		N
34	A	88885100	3.00	PC	IC 74S138 TTL DECODER/MUX	IN			PPP4		N
35	A	88885200	3.00	PC	IC 74S175 TTL QUAD D F/F W/CLR	IN			PPP4		N
36	A	88896100	9.00	PC	IC 7414 TTL HEX SCHMITT TRIGER	IN			PPP4		N
37	C	88896600	1.00	PC	INSULATOR-CARD FRAME,UPPER	IN			PPP4		N
38	C	88896700	1.00	PC	INSULATOR-CARD FRAME,LOWER	IN			PPP4		N
39	C	88896800	1.00	PC	FRAME-CARD (CASTING)	IN			PPP4		N
40	A	88897800	24.00	PC	CAP-FIXED SOLID TANT,6VDC,12UF	IN			PPP4		N
41	A	88922800	5.00	PC	IC 93S62/82S62 TTL PAR/GEN/CHK	IN			PPP4		N
42	A	88923000	4.00	PC	IC 74S74 TTL DUAL D EDGE F/F	IN			PPP4		N
43	A	88923100	2.00	PC	IC 74S174 TTL HEX D FLIP/FLOP	IN			PPP4		N
44	A	88945400	7.00	PC	JUMPER 24AWG TEF INSULATED .50	IN			PPP4		N
45	A	89636137	32.00	PC	CAP FXD CER .01MFD 100VDCW	IN			PPP4		N
62	A	89717700	9.00	PC	WASHER,NYLON,NO 6 HOLE SIZE	IN	021796	11 79	PPP4		N
46	A	91938520	2.00	PC	RESISTOR MODULE 8 PIN	IN			PPP4		N
47	C	94260301	1.00	PC	SOCKET I.C.	IN			PPP4		N
55	C	94260302	4.00	PC	SOCKET I.C.	IN			PPP4		N
24	A	94398802	1.00	PC	SWITCH,SLIDE-DIP-PCB,4 POS	IN	021575	01 80	PPP4		N
58	A	96720002	1.00	PC	IC-FPLA,DMA EXTENDER	IN			AYN4		N
48	A	96744157	3.00	PC	IC 74279 TTL S-R LATCH	IN			PPP4		N
49	A	96744215	12.00	PC	IC 8832 TTL DUAL DIFF LINE DR	IN			PPP4		N
59	A	96750962	1.00	PC	ROM SET-DMA EXTENDER	IN			KTN4		N
50	D	96752132	1.00	PC	PWB-DMA CONTROLLER	IN			PPP4		N
51	C	96752134	REF	PC	LOGIC DIAG-DMA CONTROLLER 7GGT	IN			RFE4		N
52	A	96752406	2.00	PC	RES NETWORK,10 PIN SIP 1000OHM	IN			PPP4		N
53	A	96860403	1.00	PC	OSCILLATOR-HBD CLK,25.0000 MHZ	IN			PPP4		N
[illegible]	A	[illegible]	1.00	PC	PWB-DMA CONTROLLER	IN	[illegible]	[illegible]	[illegible]		N
50	A	[illegible]	1.00	PC	PWB-DMA CONTROLLER	OUT	[illegible]	[illegible]	PPP4		N

INACTIVE

NUMBER OF LINE ITEMS = 65
HIGHEST FIND NUMBER = 62

SCMD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-8. DMA Extender (DMAX) PWA, 7GGT (Sheet 14 of 14)

REVISION RECORD						
REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
-1		CLASS C	BR	8-18-80		AW
A	OS 22030	CL. A. RELEASED	BR	1-12-81		AW

CAUTION:

THIS PWA CONTAINS ELECTROSTATIC SENSITIVE DEVICES WHICH MAY BE PERMANENTLY DAMAGED BY IMPROPER HANDLING. OBSERVE HANDLING PROCEDURES OUTLINED IN CDC STD 1.60.010 & CDC ENGR SPEC 16013100 WHEN ASSEMBLING, INSTALLING, REMOVING OR TRANSPORTING THIS PWA.

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.024.

DRN	7-31-80
CHKD	
ENG	1-13-81
MFG	1-13-81
APP	1-12-81

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037

TITLE PW ASSY — DMA EXTENDER 9MJT

CODE IDENT 09132 | A | DWG No 96890024

SCALE | SHEET 1 OF 4

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 2	DOCUMENT NO 96890024	REV A

NOTES:

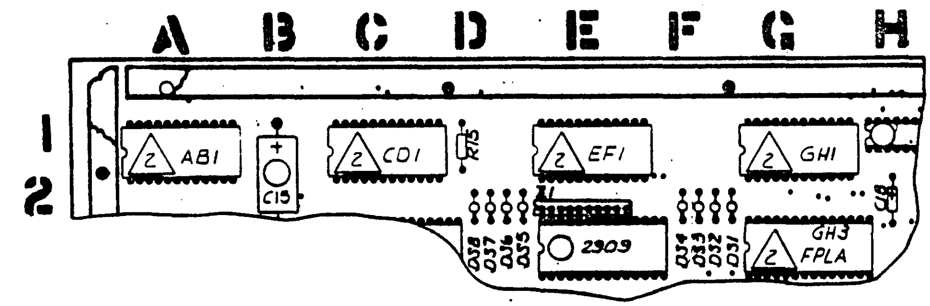
1. MARK PART NO. PER CDC SPEC 88818000.
2. (2) INSTALL FN 1 PER TABLE BELOW: INSURE I.C. PIN 1 MATCHES SOCKET PIN 1

ROM SET	
PART NO.	LOCATION
96720004	GH1 (BITS 00-07)
96720005	EF1 (BITS 08-15)
96720006	CD1 (BITS 16-23)
96720007	AB1 (BITS 24-31)
FPLA	
96720002	GH3

PRINTED IN U.S.A.

Figure 7-9. DMA Extender (DMAX) PWA, 9MJT (Sheet 1 of 2)

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 08132	SHEET 3		DOCUMENT NO 96890024	REV A



ASSEMBLY PARTS LIST

SH 4

CONTROL DATA CORPORATION

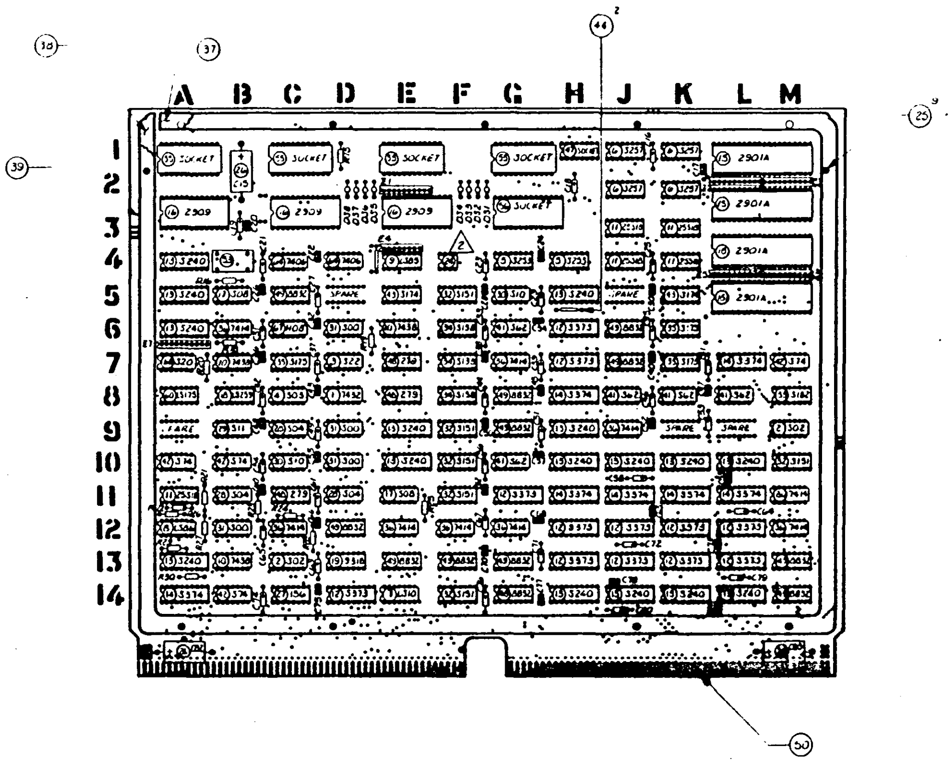
96890024	A	A	A	PWA-DMA EXTENDER (9MJT)	DS	HUETRA	12/23/80		12/23/80	1/ 1

4	A	96720002	1.00	PC	IC-FPLA,DMA EXTENDER	IN			AYMA		N
1	A	96750962	1.00	PC	ROM SET-DMA EXTENDER	IN			ETMA		N
2	D	96890680	1.00	PC	PW SUBASSY-DMA EXTENDER	IN					N
3	C	96890780	REF	PC	LOGIC DIAG-DMA EXTENDER	IN					N

NUMBER OF LINE ITEMS = 4
HIGHEST FIND NUMBER = 4

SCMD MFG INFO

Figure 7-9. DMA Extender (DMAX) PWA, 9MJT (Sheet 2 of 2)



FIND NO	QTY	REFERENCE DESIGNATOR
20	4	R19, R20, R25, R28
21	1	R27
22	6	R15, R21, R22, R26, R29, R30
40	34	C16, C18, C19, C21, C23, C25, C27, C29, C31, C33, C35, C37, C39
		C41, C42, C44, C46, C49, C51, C53, C54, C56, C58, C61, C64
		C65, C67, C69, C71, C72, C74, C76, C79, C80
45	32	C17, C20, C22, C24, C26, C28, C30, C32, C34, C36, C38, C40, C43
		C45, C47, C48, C50, C52, C55, C59, C60, C62, C63, C66, C68
		C70, C73, C75, C77, C78, C81
46	1	Z4
52	2	Z2, Z5
61	4	R16, R18, R23, R24
62	1	E1
63	2	Z3, E6
66	8	DS1 – DS8
69	1	Z7

CAUTION:
THIS PWA CONTAINS ELECTROSTATIC SENSITIVE DEVICES WHICH MAY BE PERMANENTLY DAMAGED BY IMPROPER HANDLING. OBSERVE HANDLING PROCEDURES OUTLINED IN CDC STD 1.65 010 AND CDC ENG SPEC 18013100 WHEN ASSEMBLING, INSTALLING, REMOVING, OR TRANSPORTING THIS PWA

2. TAPE SEAL ON TOP OF DIP SWITCH TO BE REMOVED ONLY AFTER SOLVENT FLUX WASH CYCLE HAS BEEN COMPLETED

1. ASSEMBLE PER CDC SPEC 65018000 EXCEPT IDENTIFY WITH PT NO & REV

NOTES: UNLESS OTHERWISE SPECIFIED

PW SUB ASSY — DMA EXTENDER

D 09132 96890480

Figure 7-10. DMA Extender (DMAX) PWA Subassembly 9MJT (Sheet 1 of 3)

TITLE: PW-SUB ASSY - DMA EXTENDER	PREFIX: PL	DOCUMENT NO.: 96890480 / REV. A
CODE IDENT 00132 · FIRST USED ON: BU272-A		SHEET 1 OF 3

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
-1		CLASS C	BR	8-18-80	AJ	AW
A	DS22030	CL. A. RELEASED	BR	1-12-81		AW

NOTES:

DETACHED LISTS

CONTROL DATA CORPORATION ASSEMBLY PARTS LIST

SHT 2

96890480	A	A	D	PW SUBASSY-DMA EXTENDER	DS	BU272A	12/23/80		12/31/80	1/ 2

1	A	15114700	1.00	PC	MICRO CIRCUIT 7432	IN			PPP4		N
3	C	15127300	1.00	PC	INTEGRATED CIRCUIT	IN			PPP4		N
5	A	15144200	2.00	PC	IC 74S253 MUX, DUAL 4-IN	IN			PPP4		N
6	A	15144300	4.00	PC	IC-74S257 TTL QUAD 2-INPUT MUX	IN			PPP4		N
7	A	15145600	1.00	PC	IC TTL TRPL.3INPUT NAND 74LS10	IN			PPP4		N
8	A	15146400	1.00	PC	IC TTL QUAD 2INPUT EXC 74LS86	IN			PPP4		N
60	A	15146900	1.00	PC	IC-TTL,LATCH 4 BIT 74LS175	IN			PPP4		N
9	A	15147200	1.00	PC	IC-74LS85 TTL 4 BIT COMPARATOR	IN			PPP4		N
10	A	15150300	3.00	PC	I C 7438	IN			PPP4		N
2	A	15150500	2.00	PC	IC-TTL QUAD 2 INPUT NOR 74S02	IN			PPP4		N
4	A	15161500	1.00	PC	IC 74S03	IN			PPP4		N
11	A	15162700	5.00	PC	IC 25S18 QUAD D, REGISTER, TTL	IN			PPP4		N
12	A	15162800	12.00	PC	IC-OCTAL LATCH,TTL 74S373	IN			PPP4		N
13	A	15163210	16.00	PC	IC 74S240	IN			PPP4		N
14	A	15163310	7.00	PC	IC 74S374 OCTAL LATCH TTL	IN			PPP4		N
15	A	15163316	4.00	PC	IC-2901A MICROPROCESSOR,4 BIT	IN			PPP4		N
16		15163317	3.00	PC	I.C,2909	IN			PPP4		N
17	A	15163600	2.00	PC	IC 74S08	IN			PPP4		N
18	A	15164401	1.00	PC	IC-74LS259 8 BIT ADDR LATCH	IN			PPP4		N
19	A	17105500	1.00	PC	I.C.ENCODER,8BIT PRI 9318	IN			PPP4		N
61	C	24500047	4.00	PC	RES FXD .25W 220 OHMS	IN			PPP4		N
20	C	24500055	4.00	PC	RES FXD .25W 470 OHMS	IN			PPP4		N
21	C	24500063	1.00	PC	RES FXD .25W 1000 OHMS	IN			PPP4		N
22	C	24500071	6.00	PC	RES FXD .25W 2200 OHMS	IN			PPP4		N
66	A	39996301	8.00	PC	DIODE (LITE EMITTING)	IN			PPP4		N
56	A	51050101	1.00	PC	SOCKET,IC,PC TYPE 28 PIN	IN			PPP4		N
25	A	88012400	9.00	PC	RIVET-SEMI-TUBULAR,BRS .312 LG	IN			PPP4		N
26	A	88000500	3.00	PC	CAP ELECT-ALUM 16VDC 100UF	IN			PPP4		N
67	A	88001200	1.00	PC	IC 74H08 TTL QUAD 2-INPUT AND	IN			PPP4		N
27	A	88001500	1.00	PC	IC 74154 TTL 4/16 L/DECOD/DEMUX	IN			PPP4		N
28	A	88003700	3.00	PC	IC 74S04 SCHOTTKY TTL HEX INV	IN			PPP4		N
29	A	88004100	1.00	PC	IC 74S11 SCHOTTKY TTL TPL 3-I	IN			PPP4		N
30	A	88004200	2.00	PC	IC 74S10 SCHOTTKY TTL 3-I NAND	IN			PPP4		N
31	A	88004500	4.00	PC	IC 74S00 SCHOTTKY TTL QUAD 2-I	IN			PPP4		N
32	A	88004700	6.00	PC	IC-74S151 TTL DATA SELECTR/MUX	IN			PPP4		N
33	A	88005000	1.00	PC	IC 74S182 TTL LOOK-AHEAD GEN	IN			PPP4		N

SCMD MFG INFO

Figure 7-10. DMA Extender (DMAX) PWA Subassembly 9MJT (Sheet 2 of 3)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SHT 3

96890480	A	A	D	PW SUBASSY-DMA EXTENDER	DS	BU272A	12/23/80		12/31/80	2/ 2 MF

34	A	88885100	3.00	PC	IC 74S138 TTL DECODER/MUX	IN			PPP4		N
35	A	88885200	3.00	PC	IC 74S175 TTL QUAD D F/F W/CLR	IN			PPP4		N
68	A	88885300	1.00	PC	IC 74S20 SCHOTTKY TTL DUAL 4-I	IN			PPP4		N
36	A	88896100	9.00	PC	IC 7414 TTL HEX SCHMITT TRIGER	IN			PPP4		N
37	C	88896600	1.00	PC	INSULATOR-CARD FRAME,UPPER	IN			PPP4		N
38	C	88896700	1.00	PC	INSULATOR-CARD FRAME,LOWER	IN			PPP4		N
39	C	88896800	1.00	PC	FRAME-CARD (CASTING)	IN			PPP4		N
40	A	88897800	34.00	PC	CAP-FIXED SOLID TANT,6VDC,12UF	IN			PPP4		N
41	A	88922000	5.00	PC	IC 93S62/82S62 TTL PAR/GEN/CHK	IN			PPP4		N
42	A	88923000	4.00	PC	IC 74S74 TTL DUAL D EDGE F/F	IN			PPP4		N
43	A	88923100	2.00	PC	IC 74S174 TTL HEX D FLIP/FLOP	IN			PPP4		N
44	A	88965400	2.00	PC	JUMPER 26AWG TEF INSULATED .50	IN			PPP4		N
45	A	89636137	32.00	PC	CAP FXD CER .01MFD 100VDCW	IN			PPP4		N
46	A	91938520	1.00	PC	RESISTOR MODULE 8 PIN	IN			PPP4		N
47	C	94260301	1.00	PC	SOCKET I.C.	IN			PPP4		N
55	C	94260302	4.00	PC	SOCKET I.C.	IN			PPP4		N
24	A	94398002	1.00	PC	SWITCH,SLIDE-DIP-PCB,4 POS	IN			PPP4		N
64	A	96744155	2.00	PC	IC 7406 TTL HEX INVERTER (OC)	IN			PPP4		N
48	A	96744157	3.00	PC	IC 74279 TTL S-R LATCH	IN			PPP4		N
49	A	96744215	12.00	PC	IC 8832 TTL DUAL DIFF LINE DR	IN			PPP4		N
69	A	96752401	1.00	PC	RES NETWORK,10 PIN SIP 330 OHM	IN	022030	12[illegible]80	PPP4		N
63	A	96752402	2.00	PC	RES NETWORK,10 PIN SIP 470 OHM	IN	022030	12[illegible]80	PPP4		N
52	A	96752412	2.00	PC	RES NETWORK,10 PIN SIP 2200OHM	IN			PPP4		N
62	A	96752424	1.00	PC	RES NETWORK 10-PIN SIP 220OHMS	IN			PPP4		N
53	A	96860403	1.00	PC	OSCILLATOR-HSD CLK,25.0000 MHZ	IN			PPP4		N
50	A	96890180	1.00	PC	PWB-DMA CONTROLLER	IN			PPP4		N

NUMBER OF LINE ITEMS = 62
HIGHEST FIND NUMBER = 69

SCMD MFG INFO

Figure 7-10. DMA Extender (DMAX) PWA Subassembly 9MJT (Sheet 3 of 3)

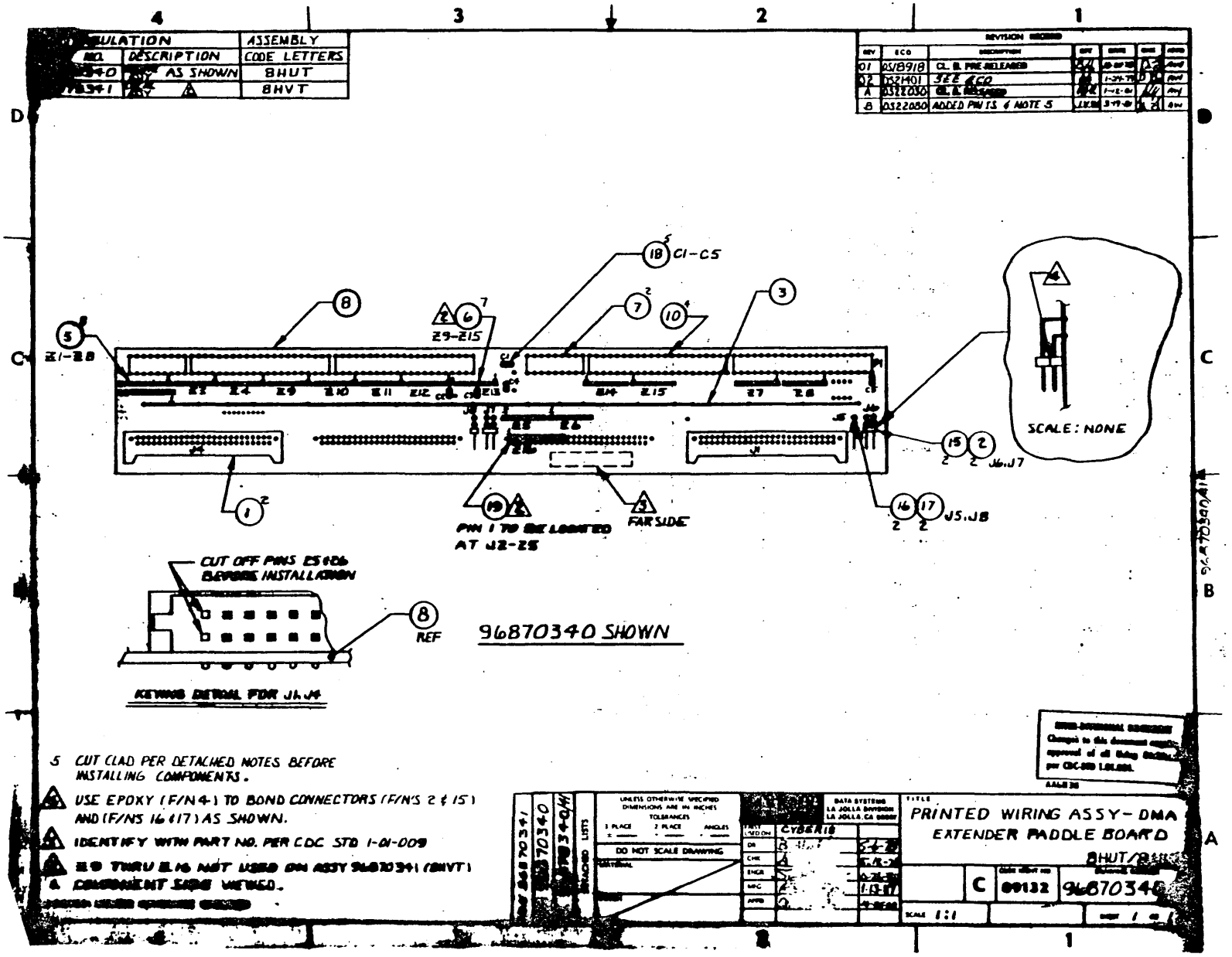


Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 1 of 6)

1(TD)

DWN		TITLE PWA-DMA EXTENDER PADDLE BOARD 8HUT/8HVT	PREFIX DN	DOCUMENT NO. 96870340/41	REV. B
CHKD					
ENG					
MFG		FIRST USED ON CYBER 18		SHEET 1 OF 6	
APPR		CODE IDENT 09132			

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS18918	CL. B. PRE-RELEASED	ZR	10-25-78		AN
02	DS21401	ADDED SH 6		1-24-79		AN
A	DS22030	CL. A. RELEASED	RK	1-12-81		AN

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC STD 1.01.024.

AA6030

NOTES

DETACHED LISTS

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DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA. 92037	CODE IDENT 09132	SHEET 2	DN	DOCUMENT NO 96870340	REV A

A CUT CLAD WHERE SHOWN:

	BETWEEN	AND
1.	J2-16	Z6-7
2.	J2-17	Z6-6
3.	J2-18	Z6-5
4.	J2-19	Z6-4
5.	J2-20	Z6-3
6.	J2-21	Z6-2
7.	J2-22	Z5-8
8.	J2-23	Z5-7
9.	J2-24	Z5-6
10.	P1-63	Z11-3
11.	P1-252	Z15-5 (COMPONENT SIDE)

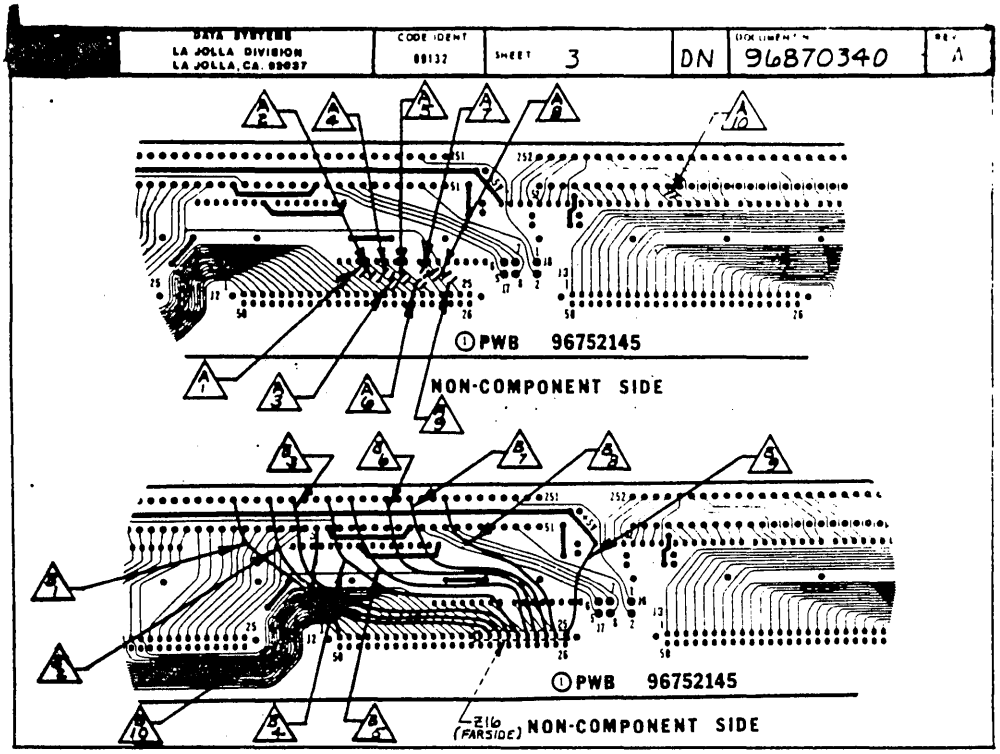
12. CUT AWAY GROUND CLAD AT P1-201, 202, 203 AS SHOWN ON SH 4.

B ADD WIRE (F/N 20) BETWEEN:

1.	Z16-9	TO P1-225	9.	Z16-1	TO Z13-1
2.	Z16-8	P1-228	10.	P1-32	TO J2-1
3.	Z16-7	P1-230			
4.	Z16-6	P1-233			
5.	Z16-5	P1-235			
6.	Z16-4	P1-238			
7.	Z16-3	P1-240			
8.	Z16-2	P1-243			

PRINTED IN U.S.A.

Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 2 of 6)



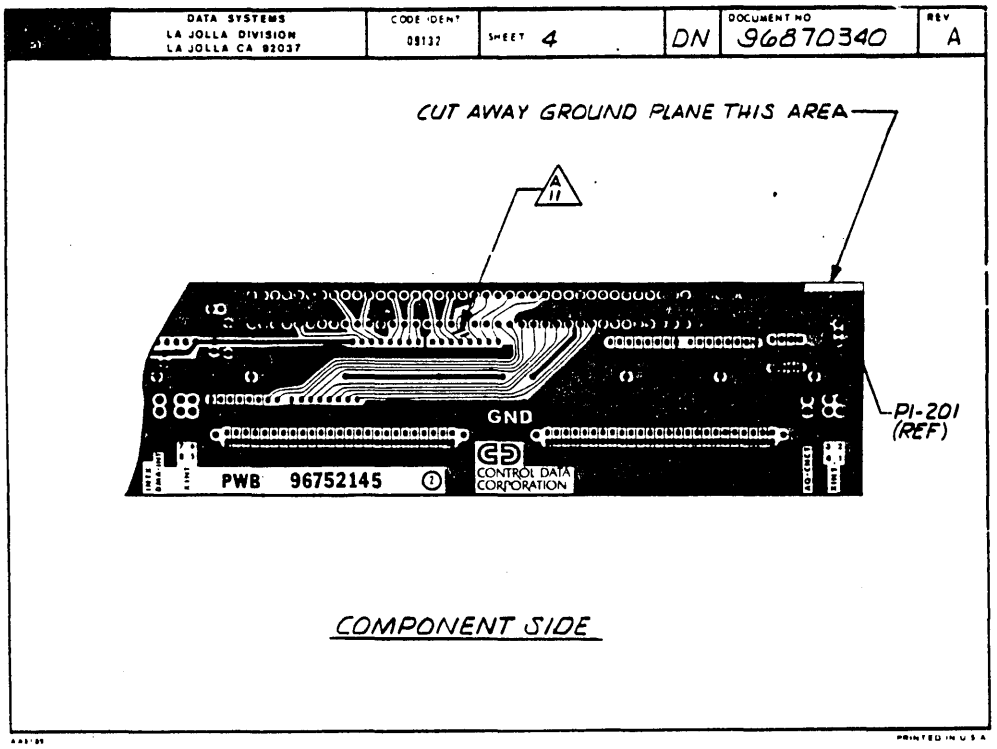
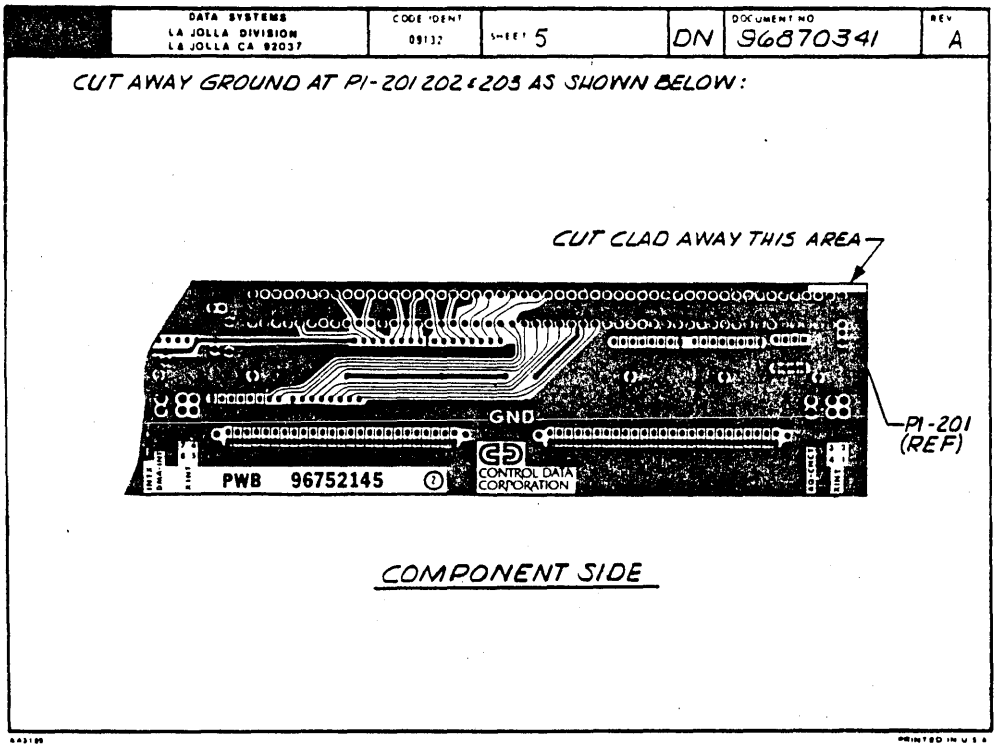


Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 3 of 6)



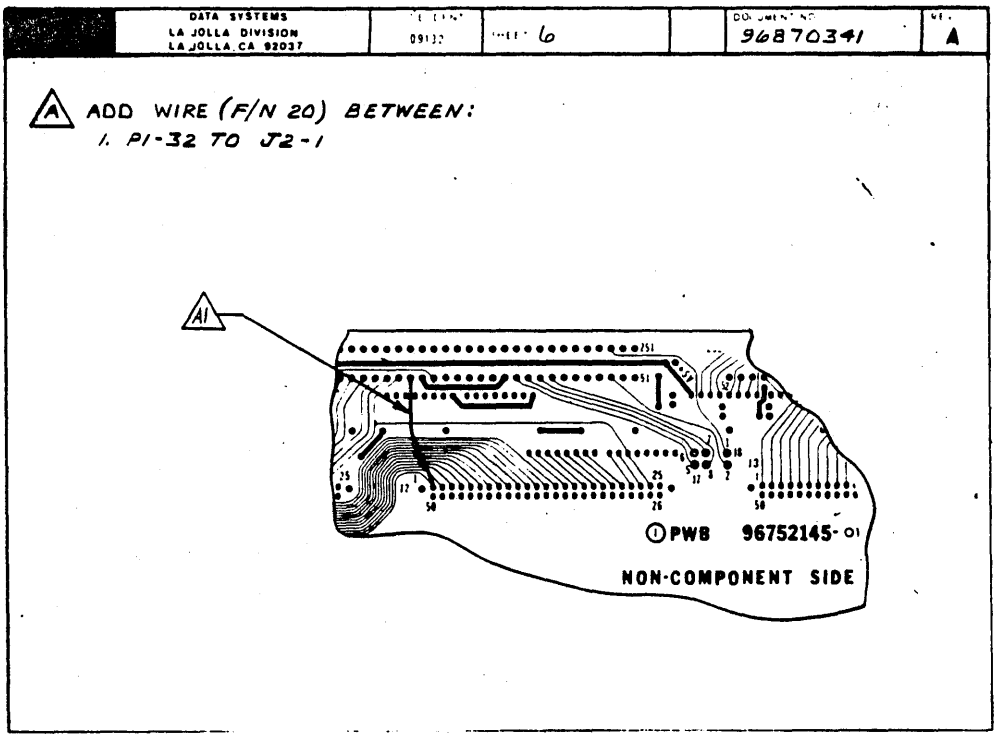


Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 4 of 6)

1(TD)

DSGN / CHKR / ENG / MFG / APPR	CODE IDENT 09132
TITLE	PWA-DMA EXTENDER PADDLE BOARD (8HVT, 8HUT)
PREFIX	PL
DOCUMENT NO.	96870340/41
REV.	B
FIRST USED ON	CYBER 18
SHEET	1 OF 3

SHEET REVISION STATUS

REVISION RECORD

REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS18918	CL. B. PRE-RELEASED	BH	10-25-78		AXI
02	DS21401	SEE ECO		1-24-79		AXI
A	DS22030	CL. A. RELEASED		1-12-81		AW

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.024.

AA6030

NOTES:

DETACHED LISTS

AA0100 REV. 8-71 PRINTED IN U.S.A.

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SHT. 2

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96870340	B	A	C	PWA-DMA EXT REMOTE PAD BD 8HUT	DSM	CBR 18	10/25/78	022080	03/17/81	1/ 1 MF

FIND NUMBER		PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/BUY PART TYPE		
1	A	39903606	2.00	PC	CONN,HEADER,RIGHT ANGLE (2X25)	IN			PPP4		N
20	C	52629949	30.00	IN	WIRE ELEC 30 GA WHITE	IN			PPP1		N
4	A	62019900	0.01	OZ	EPOXY, 2 PART 5 MIN(CLEAR)TUBE	IN			RFE4		N
3	D	88875500	1.00	PC	BUS BAR (13 IN)	IN			PPP4		N
5	A	88924703	8.00	PC	RES NETWORK-SIP,8 PIN,330 OHM	IN			PPP4		N
6	A	88924706	7.00	PC	RES NETWORK-SIP,8 PIN,1.K OHM	IN			PPP4		N
18	A	89636136	5.00	PC	CAP FXD CER .01MFD 50VDCW	IN			PPP4		N
7	A	96751917	2.00	PC	CONNECTOR-PWB .125 CTR 18 POS	IN			PPP4		N
16	A	96752033	2.00	PC	CONN,HEADER-RT ANG(LOW- 1 POS)	IN			PYM4		N
2	A	96752034	2.00	PC	CONN,HEADER-RT ANG(LOW- 2 POS)	IN			PYM4		N
17	A	96752036	2.00	PC	CONN,HEADER-RT ANG(UPPR- 1 POS	IN			PYM4		N
15	A	96752037	2.00	PC	CONN,HEADER-RT ANG(UPPR- 2 POS	IN			PYM4		N
8	D	96752145	1.00	PC	PWA-DMA EXTENDER PADDLEBOARD	IN			PPP4		N
19	A	96752406	1.00	PC	RES NETWORK,10 PIN SIP 1000OHM	IN			PPP4		N
10	A	96756701	4.00	PC	CONNECTOR-PWB .125 CENTERS	IN			PPP4		N
9	D	96870540	REF	PC	SCHEM-DMA EXT RMT PDLBD 8HVT	IN			RFE4		N

NUMBER OF LINE ITEMS = 16
HIGHEST FIND NUMBER = 20

SCMD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 5 of 6)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SHT. 3

ASSEMBLY NUMBER	REV	CL	DW SZ	ASSEMBLY DESCRIPTION	DESIGN SOURCE	FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96870341	A	A	C	PWA-DMA EXT LOCAL PAD BD 8HVT	DSM	CBR 1A	10/25/78	022080	03/17/81	1/ 1 MF

FIND NUMBER	DW SZ	PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE	MAKE/BUY PART TYPE	PH NO	
1	A	39903606	2.00	PC	CONN,HEADER,RIGHT ANGLE (2X25)	IN			PPP4		N
20	C	52629949	6.00	IN	WIRE ELEC 30 GA WHITE	IN	021401	011979	PPP1		N
4	A	62019900	0.01	OZ	EPOXY, 2 PART 5 MIN(CLEAR)TUBE	IN			RFE4		N
3	D	88875500	1.00	PC	BUS BAR (13 IN)	IN			PPP4		N
5	A	88924703	8.00	PC	RES NETWORK-SIP,8 PIN,330 OHM	IN			PPP4		N
18	A	89636136	5.00	PC	CAP FXD CER .01MFD 50VDCW	IN			PPP4		N
7	A	96751917	2.00	PC	CONNECTOR-PWB .125 CTR 18 POS	IN			PPP4		N
16	A	96752033	2.00	PC	CONN,HEADER-RT ANG(LOW- 1 POS)	IN			PYM4		N
2	A	96752034	2.00	PC	CONN,HEADER-RT ANG(LOW- 2 POS)	IN			PYM4		N
17	A	96752036	2.00	PC	CONN,HEADER-RT ANG(UPPR- 1 POS	IN			PYM4		N
15	A	96752037	2.00	PC	CONN,HEADER-RT ANG(UPPR- 2 POS	IN			PYM4		N
8	D	96752145	1.00	PC	PWB-DMA EXTENDER PADDLEBOARD	IN			PPP4		N
~~[illegible]~~	~~A~~	~~[illegible]~~	~~1.00~~	~~PC~~	~~RES NETWORK,10 PIN SIP 1000OHM~~	~~OUT~~	~~021401~~	~~011979~~	~~PPP4~~		~~N~~
10	A	96756701	4.00	PC	CONNECTOR-PWB .125 CENTERS	IN			PPP4		N
9	D	96870541	REF	PC	SCHEM-DMA EXT LOCAL PD/BD 8HVT	IN			RFE4		N

NUMBER OF LINE ITEMS = 15
HIGHEST FIND NUMBER = 20

SCHD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-11. Remote/Local (DMAX) Paddle Board PWA, 8HUT/8HVT (Sheet 6 of 6)

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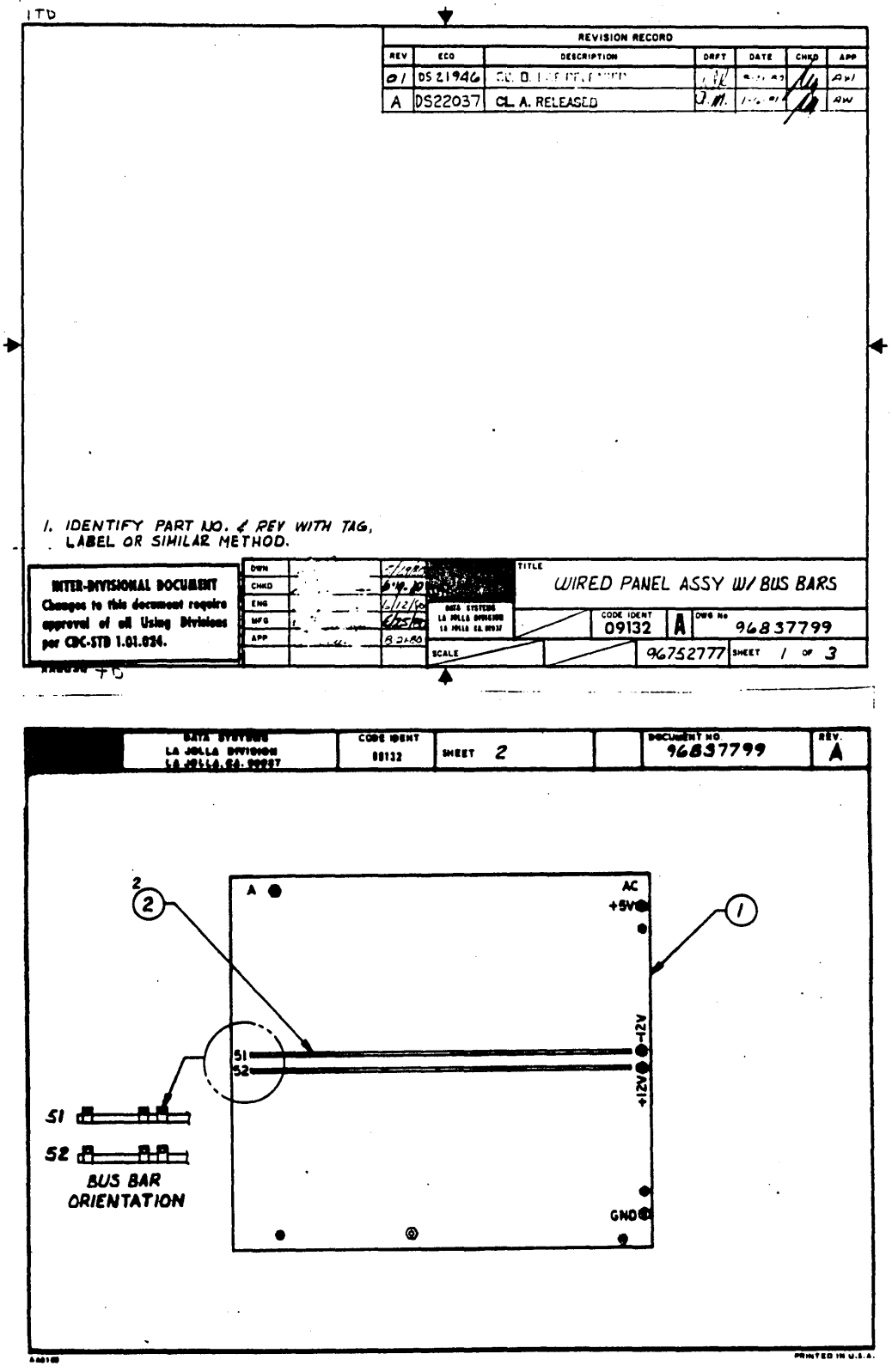

Figure 7-13. IOX Wired Backpanel (Sheet 1 of 2)

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 3

96837799	A	A	WIRED PANEL ASSY-W/BUS BARS	DSM	CW21HA	08/14/80	022037	12/05/80		MF

ITEM NUMBER	LT	PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	RELEASE STATUS	CHANGE DOC. NUMBER	DATE EFFECTIVE	MANUFACTURER TYPE	MF	A/M
1	A	96752575	1.00	PC	WIRED PANEL ASSY-I/O EXPANSION	IN			AYC		N
2	A	96752631	2.00	PC	BUS BAR-POWER DISTRIBUTION	IN			BBBA		N

NUMBER OF LINE ITEMS = 2
HIGHEST FIND NUMBER = 2

SCM MFG INFO

INTERDIVISIONAL DOCUMENT

Figure 7-13. IOX Wired Backpanel (Sheet 2 of 2)

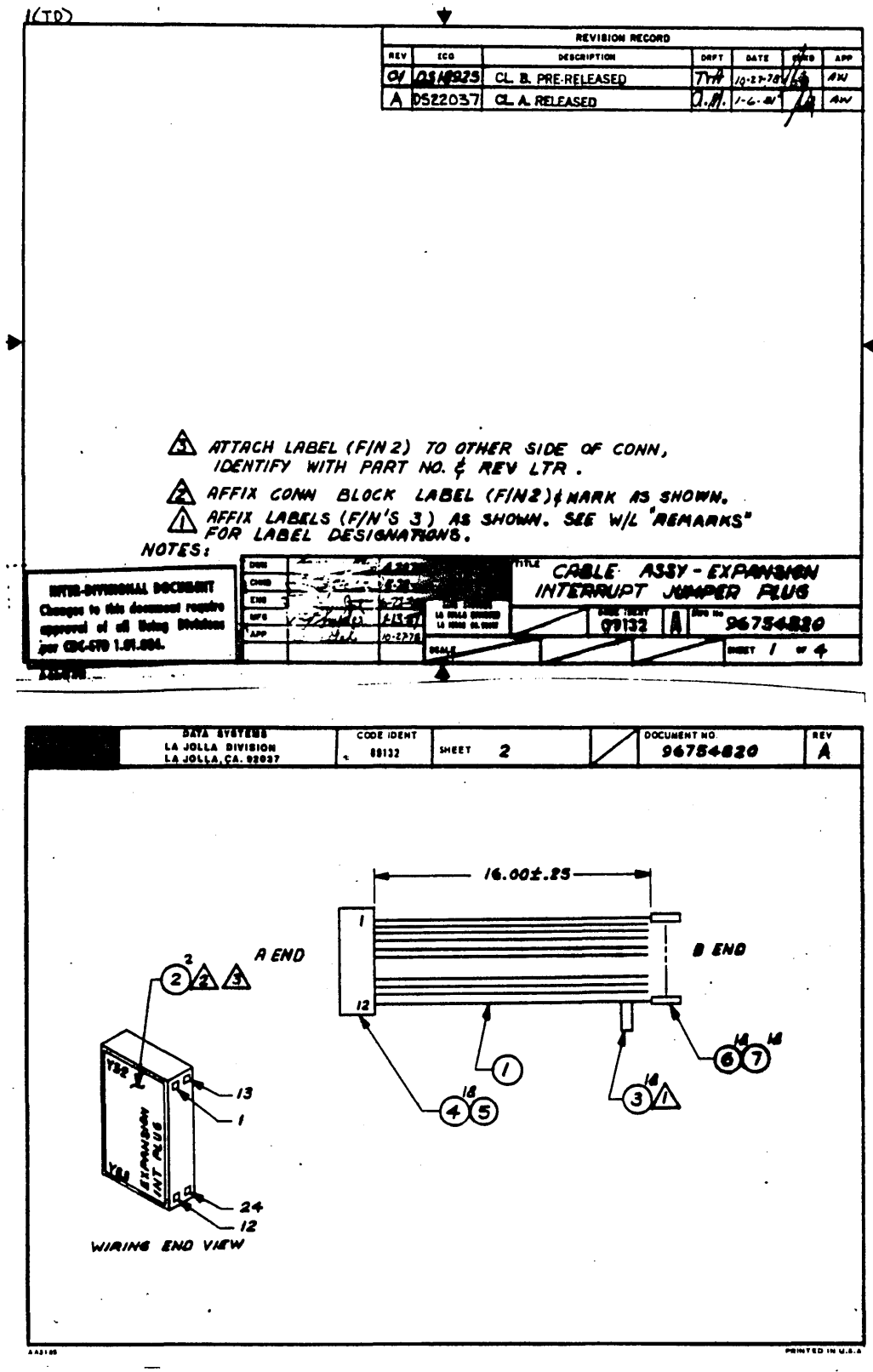

Figure 7-14. Expansion Interrupt Connector Assembly (Sheet 1 of 2)

DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037	CODE IDENT 09132	SHEET 3	WL	DOCUMENT NO 96754820	REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX) INCHES	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS	
1	1	24	BLK	16.00	A END	2	4	B END		6,7	INT1E	1
2						14					INT2E	
3						3					INT3E	
4						15					INT4E	
5						4					INT5E	
6						16					INT6E	
7						5					INT7E	
8						17					INT8E	
9						8					XINT1	
10						20					XINT2	
11						9					XINT3	
12						21					XINT4	
13						10					XINT5	
14						22					XINT6	
15						11					XINT7	
16						23					XINT8	
17						6					SSEL01/	
18	1	24	BLK	16.00	A END	18	4	B END		6,7	SPT01/	1
19												
20												

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CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 4

ASSEMBLY NUMBER	REV	CL		ASSEMBLY DESCRIPTION		FIRST USAGE	RELEASE DATE	CHANGE ORD. NUMBER	PROCESSING DATE	PAGE NUMBER
96754820	A	A	A	CABLE ASSY-EXPANSION INTERRUPT	DSM	020151	10/25/78	022037	12/05/80	~~1/ 1~~ MF

FIND NUMBER		PART NUMBER	QUANTITY	UNIT MEAS.	PART DESCRIPTION	IN/OUT STATUS	CHANGE ORD. NUMBER	DATE EFFECTIVE			
1	C	24548301	308.00	IN	WIRE,ELECT,24 GA,PVC,UL,BLK	IN			PPP4		N
2	A	39397102	2.00	PC	LABEL,WRITE ON	IN			PPP3		N
3	A	39397105	16.00	PC	LABEL,WRITE ON	IN			PPP3		N
4	C	94245601	16.00	PC	CONTACT-CRIMP INSERT SOCKET	IN			PPP4		N
5	C	94360801	1.00	PC	HOUSING-CONN,SOCKET .125 24CAV	IN			PPP4		N
7	D	94374202	16.00	PC	CONN-LOW FORCE, HOUSING 1 POS	IN			PPP4		N
6	A	95873500	18.00	PC	CONTACT,LOCKING,CLIP GOLD	IN			PPP4		N

NUMBER OF LINE ITEMS = 7
HIGHEST FIND NUMBER = 7

FC I'F) INTERDIVISIONAL DOCUMENT

Figure 7-14. Expansion Interrupt Connector Assembly (Sheet 2 of 2)

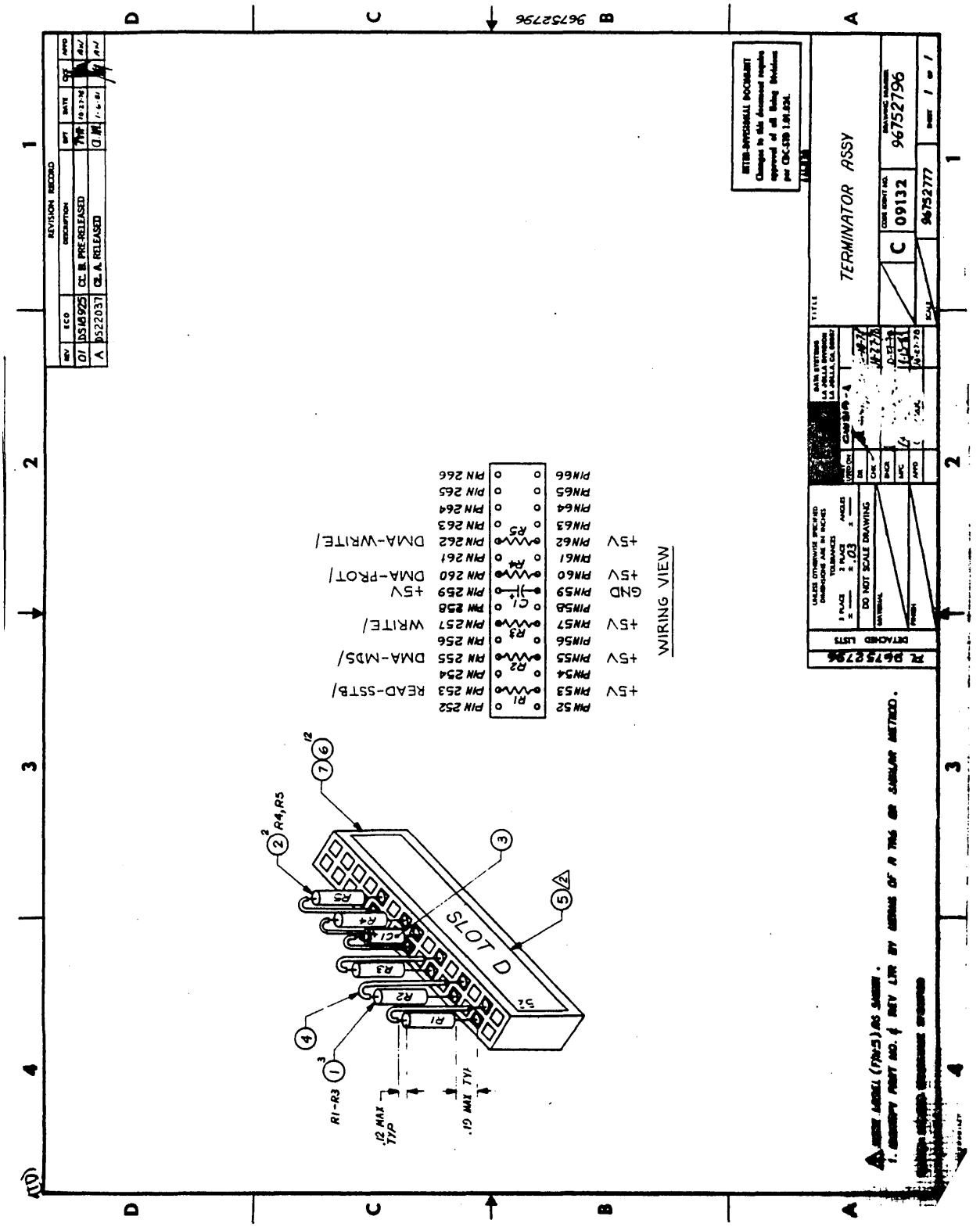

Figure 7-15. Terminator Assembly (Sheet 1 of 2)

DWN				TITLE TERMINATOR ASSY	PREFIX PL	DOCUMENT NO 96752796	REV A
CHKD			DATA SYSTEMS LA JOLLA DIVISION	FIRST USED ON CW218-A		SHEET 1 OF 2	
ENG			CODE IDENT 09132				
MFG							
APPR							

SHEET REVISION STATUS

REVISION RECORD

01	DS18925	CL. B. PRE RELEASED				
A	DS22037	CL. A. RELEASED				

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.024.

AA6030

NOTES.

ATTACHED LISTS

CONTROL DATA CORPORATION

ASSEMBLY PARTS LIST

SH 2

96752796	A	A	C	TERMINATOR ASSY	DSM	020151	10/25/78	022037	12/05/80	~~1/1~~	MF

1	C	24500047	3	PC	RES FXD .25W 220 OHMS	IN			PPP4		N
2	C	24500052	2	PC	RES FXD .25W 360 OHMS	IN			PPP4		N
3	C	24505229	1	PC	CAP,FXD SOL TA 35V 1.0UF 10PCT	IN			PPP4		N
4	C	24528624	6	IN	INS, SLV, ELEC-BULK	IN			PPP1		N
5	A	39397105	1	PC	LABEL,WRITE ON	IN			PPP3		N
6	C	94245600	12	PC	CONTACT-CRIMP,INSERT,SOCKET	IN			PPP4		N
7	C	94360807	1	PC	HOUSING-CONN,SOCKET .125 30CAV	IN			PPP4		N

NUMBER OF LINE ITEMS = 7
HIGHEST FIND NUMBER = 7

SCHD MFG INFO INTERDIVISIONAL DOCUMENT

Figure 7-15. Terminator Assembly (Sheet 2 of 2)

WIRE LISTS 8

This section contains only the wire string and element (pin) list portion of the I/O expansion chassis backpanel wire list, P/N 96752570.

(TD)

REVISION RECORD						
REV	ECO	DESCRIPTION	DRFT	DATE	CHKD	APP
01	DS16385	CL. B. PRE-RELEASED		10-27-78		AW
02	DS21637	SEE ECO	JM	5-2-80		AW
A	DS22037	CL. A. RELEASED	J.M.	1-10-81		AW

2. BACKPANEL PREP LIST(9475279S) MUST BE INSTALLED BEFORE THIS WIRE STRING LIST IS INSTALLED.

1. THIS DOCUMENT CONSISTS OF AN ADD LIST, ELEMENT LIST, STRING LIST & FROM TO LEVEL 1,2 LIST.

NOTES:

INTER-DIVISIONAL DOCUMENT
Changes to this document require approval of all Using Divisions per CDC-STD 1.01.004.

DSGN		3-16-78
CHKD		4-4-78
ENG		4-28-78
MFG		4-13-81
APP		4-27-78

LA JOLLA DIVISION
LA JOLLA, CA. 92037

TITLE: WIRE STRING LIST - I/O EXPANSION

CODE IDENT: 09132 | SIZE: A | DWG NO: 9G7582570

SCALE: | 9G7582575 | SHEET 1 OF 134

DATA SYSTEMS
LA JOLLA DIVISION
LA JOLLA, CA 92037

CODE IDENT 09132 | SHEET 2 | WL | DOCUMENT NO 9G7582570 | REV A

CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS
		30			D	2		D	53		+5V
		↓			↓	53		↓	55		↓
						55			57		
						57			259		
						259			60		↓
						60			62		+5V
						54			56		GND
						56			58		↑
						58			59		
						59			61		↓
						61		↓	63		GND
						253		D	254		READ - SSTB/
						253		E	248		READ-SSTB/
						255		D	256		DMA - MDS/
						255		F	242		DMA-MDS/
						257		D	258		WRITE/
						257		F	290		WRITE/
		↓			↓	260		D	261		DMA - PROT/
		30			D	260		F	232		DMA-PROT/

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DATA SYSTEMS LA JOLLA DIVISION LA JOLLA, CA 92037					CODE IDENT 08132			SHEET 3		WL	DOCUMENT NO 96752570	REV A
CONDUCTOR IDENT	FIND NO	GAUGE (REF)	COLOR (REF)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO	REMARKS	
		30			D	Z62		D	Z63		DMA - WRITE	
		30			D	Z62		F	63		DMA-WRITE	
		↑			AB	Z37		AA	Z37		DMA - PFLT/	
					AA	↑		W	↑		↑	
					W			U				
					U			S				
					S			P				
					P			M				
					M			K				
		↓			K	↓		H	↓		↓	
		30			H	Z37		F	Z37		DMA - PFLT/	

AA3182 REV. 8-71 PRINTED IN U.S.A.

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WH5536-B
CDC/LA JOLLA — *** ELEMENT LIST *** — DATE 07/10/78 — PAGE 1

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
	AA	(0)	203	0.00	SU01/		1231
			204	0.00	RU01/		1232
			205	0.00	SU02/		1233
			206	0.00	RU02/		1234
			207	0.00	SU03/		1235
			208	0.00	RU03/		1236
			209	0.00	SU04/		1237
			210	0.00	RU04/		1238
			211	0.00	SU05/		1239
			212	0.00	ADR05/		1240
			213	0.00	DMA6-MAB 18/		1241
			214	0.00	RU05/		1242
			215	0.00	SU06/		1243
			216	0.00	REPLY/		1244
			217	0.00	ADR06/		1245
			218	0.00	RU06/		1246
			219	0.00	SU07/		1247
			220	0.00	REJECT/		1248
			221	0.00	RU07/		1249
			222	0.00	ADR07/		1250
			223	0.00	SD08/		1251
			224	0.00	RU08/		1252
			225	0.00	DMA1-MR/		1253
			226	0.00	DMA1-MA/		1254
			227	0.00	REMOTE/		1255
			228	0.00	DMA2-MR/		1256
			229	0.00	DMA2-MA/		1257
			230	0.00	DMA3-MR/		1258
			231	0.00	DMA3-MA/		1259
			232	0.00	DMA-PROT /		1260
			233	0.00	DMA4-MR/		1261
			234	0.00	DMA4-MA/		1262
			235	0.00	DMA5-MR/		1263
			236	0.00	DMA5-MA/		1264
			238	0.00	DMA6-MR/		1265
			239	0.00	DMA6-MA/		1266
			240	0.00	DMA7-MR/		1267
			241	0.00	DMA7-MA/		1268
			242	0.00	DMA3-MAB 18/		1269
			243	0.00	DMA8-MR/		1270
			244	0.00	DMA8-MA/		1271
			245	0.00	ADR04/		1272
			246	0.00	ADR03/		1273
			247	0.00	ADR02/		1274
			248	0.00	REAC-SST 5/		1275
			249	0.00	RPINTYY/		1276
			250	0.00	DMA2-MAB 18/		1277
			252	0.00	DMA-MPE/		1278
			253	0.00	DMA-MAB1 1/		1279
			254	0.00	DMA-MAB1 2/		1280
			255	0.00	DMA-MAB1 3/		1281

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WH5536-B
CDC/LA JOLLA — *** ELEMENT LIST *** — DATE 07/10/78 — PAGE 2

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			256	0.00	DMA-MAB1 4/		1282
			257	0.00	DMA-MAB1 5/		1283
			258	0.00	DMA-MAB1 6/		1284
			262	0.00	DMA-MDS/		1285
			263	0.00	DMA-MAE/		1286
			264	0.00	DMA-DTM0 1/		1287
			265	0.00	DMA-DTM0 2/		1288
			266	0.00	DMA-DTM0 3/		1289
			267	0.00	DMA-DTM0 4/		1290
			268	0.00	DMA-DTM0 5/		1291
			269	0.00	DMA-DTM0 6/		1292
			270	0.00	DMA-DTM0 7/		1293
			271	0.00	DMA-DTM0 8/		1294
			272	0.00	DMA-DTM0 9/		1295
			273	0.00	DMA-DTM1 0/		1296
			274	0.00	DMA-DTM1 1/		1297
			275	0.00	DMA-DTM1 2/		1298
			276	0.00	DMA-DTM1 3/		1299
			277	0.00	DMA-DTM1 4/		1300
			278	0.00	DMA-DTM1 5/		1301
			279	0.00	DMA-DTM1 6/		1302
			280	0.00	ADR01/		1303
			281	0.00	ADR08/		1304
			282	0.00	ADR09/		1305
			283	0.00	ADR10/		1306
			284	0.00	ADR11/		1307
			285	0.00	DMA1-INT		1308
			286	0.00	DMA2-INT		1309
			287	0.00	DMA3-INT		1310
			288	0.00	DMA4-INT		1311
			289	0.00	DMA5-INT		1312
			290	0.00	WRITE/		1313
			291	0.00	PROG PRO T/		1314
			292	0.00	WEO/		1315
			293	0.00	DMA6-INT		1316
			294	0.00	DMA7-INT		1317
			301	0.00	REMOTE/		1416
	AA*	(0)	3	0.00	DMA5-MAB 18/		1788
			4	0.00	XINT1/		1789
			5	0.00	XINT2/		1790
			6	0.00	XINT3/		1791
			7	0.00	XINT4/		1792
			35	0.00	DMA-MAB1 7/		1793
			37	0.00	DMA7-MAB 18/		1794
			38	0.00	DMA6-MAB 18/		1795
			41	0.00	XINT5/		1796
			42	0.00	XINT6/		1797
			43	0.00	XINT7/		1798
			44	0.00	XINT8/		1799
			46	0.00	MR/		1800
			47	0.00	DMA-MAB1 9/		1801

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WH5536-B
CDC/LA JOLLA — *** ELEMENT LIST *** — DATE 07/10/78 — PAGE 3

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			48	0.00	DMA8-MAB	18/	1802
			49	0.00	RPINTXX/		1803
			53	0.00	DMA-MAB0	1/	1804
			54	0.00	DMA-MAB0	2/	1805
			55	0.00	DMA-MAB0	3/	1806
			56	0.00	DMA-MAB0	4/	1807
			57	0.00	DMA-MAB0	5/	1808
			58	0.00	DMA-MAB0	6/	1809
			59	0.00	DMA-MAB0	7/	1810
			60	0.00	DMA-MAB0	8/	1811
			61	0.00	DMA-MAB0	9/	1812
			62	0.00	DMA-MAB1	0/	1813
			63	0.00	DMA-WRIT	E	1814
			64	0.00	DFM01		1815
			65	0.00	DFM02		1816
			66	0.00	DFM03		1817
			67	0.00	DFM04		1818
			68	0.00	DFM05		1819
			69	0.00	DFM06		1820
			70	0.00	DFM07		1821
			71	0.00	DFM08		1822
			72	0.00	DFM09		1823
			73	0.00	DFM10		1824
			74	0.00	DFM11		1825
			75	0.00	DFM12		1826
			76	0.00	DFM13		1827
			77	0.00	DFM14		1828
			78	0.00	DFM15		1829
			79	0.00	DFM16		1830
			80	0.00	DMA1-MAB	18/	1831
			81	0.00	DMA8-INT		1832
	A8	(8)	203	0.00	SU01/		1818
			204	0.00	RU01/		1319
			205	0.00	SU02/		1320
			206	0.00	RU02/		1321
			207	0.00	SU03/		1322
			208	0.00	RU03/		1323
			209	0.00	SU04/		1324
			210	0.00	RU04/		1325
			211	0.00	SU05/		1326
			212	0.00	AUR05/		1327
			213	0.00	DMA6-MAB	18/	1328
			214	0.00	RU05/		1329
			215	0.00	SU06/		1330
			216	0.00	REPLY/		1331
			217	0.00	AUR06/		1332
			218	0.00	RU06/		1333
			219	0.00	SU07/		1334
			220	0.00	REJECT/		1335
			221	0.00	RU07/		1336
			222	0.00	AUR07/		1337

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IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			223	0.00	SU08/		1338
			224	0.00	RU08/		1339
			225	0.00	DMA1-MR/		1340
			226	0.00	DMA1-MA/		1341
			227	0.00	REMOTE/		1342
			228	0.00	DMA2-MR/		1343
			229	0.00	DMA2-MA/		1344
			230	0.00	DMA3-MR/		1345
			231	0.00	DMA3-MA/		1346
			232	0.00	DMA-PRJT	/	1347
			233	0.00	DMA4-MR/		1348
			234	0.00	DMA4-MA/		1349
			235	0.00	DMA5-MR/		1350
			236	0.00	DMA5-MA/		1351
			238	0.00	DMA6-MR/		1352
			239	0.00	DMA6-MA/		1353
			240	0.00	DMA7-MR/		1354
			241	0.00	DMA7-MA/		1355
			242	0.00	DMA3-MAB	18/	1356
			243	0.00	DMA8-MR/		1357
			244	0.00	DMA8-MA/		1358
			245	0.00	AUR04/		1359
			246	0.00	AUR03/		1360
			247	0.00	AUR02/		1361
			248	0.00	READ-SST	B/	1362
			249	0.00	RPINTYY/		1363
			250	0.00	DMA2-MAB	18/	1364
			252	0.00	DMA-MPE/		1365
			253	0.00	DMA-MAB1	1/	1366
			254	0.00	DMA-MAB1	2/	1367
			255	0.00	DMA-MAB1	3/	1368
			256	0.00	DMA-MAB1	4/	1369
			257	0.00	DMA-MAB1	5/	1370
			258	0.00	DMA-MAB1	6/	1371
			262	0.00	DMA-MBS/		1372
			263	0.00	DMA-MAE/		1373
			264	0.00	DMA-DTA0	1/	1374
			265	0.00	DMA-DTA0	2/	1375
			266	0.00	DMA-DTA0	3/	1376
			267	0.00	DMA-DTA0	4/	1377
			268	0.00	DMA-DTA0	5/	1378
			269	0.00	DMA-DTA0	6/	1379
			270	0.00	DMA-DTA0	7/	1380
			271	0.00	DMA-DTA0	8/	1381
			272	0.00	DMA-DTA0	9/	1382
			273	0.00	DMA-DTA1	0/	1383
			274	0.00	DMA-DTA1	1/	1384
			275	0.00	DMA-DTA1	2/	1385
			276	0.00	DMA-DTA1	3/	1386
			277	0.00	DMA-DTA1	4/	1387
			278	0.00	DMA-DTA1	5/	1388
			279	0.00	DMA-DTA1	6/	1389

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				280	0.00	AUR01/		1390
				281	0.00	AUR08/		1391
				282	0.00	AUR09/		1392
				283	0.00	AUR10/		1393
				284	0.00	AUR11/		1394
				285	0.00	DMA1-INT		1395
				286	0.00	DMA2-INT		1396
				287	0.00	DMA3-INT		1397
				288	0.00	DMA4-INT		1398
				289	0.00	DMA5-INT		1399
				290	0.00	WRITE/		1400
				291	0.00	PROG PRC	T/	1401
				292	0.00	WEU/		1402
				293	0.00	DMA6-INT		1403
				294	0.00	DMA7-INT		1404
				301	0.00	REMOTE/		1417
		A8*	(0)	3	0.00	DMA5-MAB	16/	1833
				4	0.00	XINT1/		1834
				5	0.00	XINT2/		1835
				6	0.00	XINT3/		1836
				7	0.00	XINT4/		1837
				35	0.00	DMA-MAB1	7/	1838
				37	0.00	DMA7-MAB	16/	1839
				38	0.00	DMA4-MAB	16/	1840
				41	0.00	XINT5/		1841
				42	0.00	XINT6/		1842
				43	0.00	XINT7/		1843
				44	0.00	XINT8/		1844
				46	0.00	MR/		1845
				47	0.00	DMA-MAB1	9/	1846
				48	0.00	DMA8-MAB	16/	1847
				49	0.00	RMINTXX/		1848
				53	0.00	DMA-MAB0	1/	1849
				54	0.00	DMA-MAB0	2/	1850
				55	0.00	DMA-MAB0	3/	1851
				56	0.00	DMA-MAB0	4/	1852
				57	0.00	DMA-MAB0	5/	1853
				58	0.00	DMA-MAB0	6/	1854
				59	0.00	DMA-MAB0	7/	1855
				60	0.00	DMA-MAB0	8/	1856
				61	0.00	DMA-MAB0	9/	1857
				62	0.00	DMA-MAB1	8/	1858
				63	0.00	DMA-WRIT	E	1859
				64	0.00	DFM01		1860
				65	0.00	DFM02		1861
				66	0.00	DFM03		1862
				67	0.00	DFM04		1863
				68	0.00	DFM05		1864
				69	0.00	DFM06		1865
				70	0.00	DFM07		1866
				71	0.00	DFM08		1867

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				72	0.00	DFM09		1868
				73	0.00	DFM10		1869
				74	0.00	DFM11		1870
				75	0.00	DFM12		1871
				76	0.00	DFM13		1872
				77	0.00	DFM14		1873
				78	0.00	DFM15		1874
				79	0.00	DFM16		1875
				80	0.00	DMA1-MAB	16/	1876
				81	0.00	DMA8-INT		1877
		AC	(0)	253	0.00	*R/		1405
				254	0.00	CHARIMPU	T/	1406
				255	0.00	STEPR/		1407
				258	0.00	RU11/		1408
				259	0.00	SU12/		1409
				260	0.00	INT2E/		1410
				261	0.00	INT3E/		1411
				262	0.00	INT4E/		1412
				263	0.00	INT5E/		1413
				264	0.00	INT7E/		1414
				265	0.00	INT8E/		1415
		AC*	(0)	3	0.00	SU01/		1879
				4	0.00	RU01/		1880
				5	0.00	SU02/		1881
				6	0.00	RU02/		1882
				7	0.00	SU03/		1883
				8	0.00	RU03/		1884
				9	0.00	SU04/		1885
				23	0.00	RU04/		1886
				24	0.00	SU05/		1887
				25	0.00	AUR05/		1888
				26	0.00	RILRM/		1889
				27	0.00	RU05/		1890
				28	0.00	SU06/		1891
				29	0.00	REPLY/		1892
				30	0.00	AUR06/		1893
				31	0.00	RU06/		1894
				32	0.00	SU07/		1895
				33	0.00	REJECT/		1896
				34	0.00	RU07/		1897
				35	0.00	AUR07/		1898
				53	0.00	SU08/		1899
				54	0.00	RU08/		1900
				55	0.00	SU09/		1901
				56	0.00	RU09/		1902
				57	0.00	SFT01/		1932
				58	0.00	SU10/		1903
				59	0.00	RU10/		1904
				60	0.00	SU11/		1905
				63	0.00	RU12/		1906

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				64	0.00	SD13/		1907
				65	0.00	RD13/		1908
				66	0.00	SD14/		1909
				67	0.00	RD14/		1910
				68	0.00	SD15/		1911
				69	0.00	RD15/		1912
				70	0.00	SD16/		1913
				71	0.00	RD16/		1914
				72	0.00	ADR04/		1915
				73	0.00	ADR05/		1916
				74	0.00	ADR02/		1917
				75	0.00	READ-SST B/		1918
				76	0.00	INT1E/		1933
				77	0.00	INT5E/		1934
				78	0.00	SSEL01/		1935
				79	0.00	SPT02/		1936
				80	0.00	ADR01/		1919
				81	0.00	ADR08/		1920
				82	0.00	ADR09/		1921
				83	0.00	ADR10/		1922
				84	0.00	ADR11/		1923
				85	0.00	ADR12/		1924
				86	0.00	ADR13/		1925
				87	0.00	ADR14/		1926
				88	0.00	ADR15/		1927
				89	0.00	ADR16/		1928
				90	0.00	WRITE/		1929
				91	0.00	PROG PRO T/		1930
				92	0.00	WE0/		1931
				96	0.00	SSEL02/		1940
				99	0.00	AQ-GND		1941
				101	0.00	AQ-GND		1878
		E	(0)	203	0.00	SD01/		542
				204	0.00	RD01/		543
				205	0.00	SD02/		544
				206	0.00	RD02/		545
				207	0.00	SD03/		546
				208	0.00	RD03/		547
				209	0.00	SD04/		548
				210	0.00	RD04/		549
				211	0.00	SD05/		550
				212	0.00	ADR05/		551
				213	0.00	RTERM/		552
				214	0.00	RD05/		553
				215	0.00	SD06/		554
				216	0.00	REPLY/		555
				217	0.00	ADR06/		556
				218	0.00	RD06/		557
				219	0.00	SD07/		558
				220	0.00	REJECT/		559
				221	0.00	RD07/		560

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				222	0.00	ADR07/		561
				223	0.00	SD08/		562
				224	0.00	RD08/		563
				225	0.00	SD09/		564
				226	0.00	RD09/		565
				227	0.00	MOS-SPT/		566
				228	0.00	SD10/		567
				229	0.00	RD10/		568
				230	0.00	SD11/		569
				231	0.00	RD11/		570
				233	0.00	SD12/		571
				234	0.00	RD12/		572
				235	0.00	SD13/		573
				236	0.00	RD13/		574
				238	0.00	SD14/		575
				239	0.00	RD14/		576
				240	0.00	SD15/		577
				241	0.00	RD15/		578
				243	0.00	SD16/		579
				244	0.00	RD16/		580
				245	0.00	ADR04/		581
				246	0.00	ADR03/		582
				247	0.00	ADR02/		583
				248	0.00	READ-SST B/		584
				249	0.00	MOS-INTP /		585
				250	0.00	MOS-INTO /		586
				251	0.00	MOS-SSEL /		587
		E*	(0)	46	0.00	OK/		1937
				47	0.00	CHARIMPU T/		1938
				48	0.00	STERM/		1939
		F	(0)	203	0.00	SD01/		588
				204	0.00	RD01/		589
				205	0.00	SD02/		590
				206	0.00	RD02/		591
				207	0.00	SD03/		592
				208	0.00	RD03/		593
				209	0.00	SD04/		594
				210	0.00	RD04/		595
				211	0.00	SD05/		596
				212	0.00	ADR05/		597
				213	0.00	RTERM/		598
				214	0.00	RD05/		599
				215	0.00	SD06/		600
				216	0.00	REPLY/		601
				217	0.00	ADR06/		602
				218	0.00	RD06/		603
				219	0.00	SD07/		604
				220	0.00	REJECT/		605
				221	0.00	RD07/		606
				222	0.00	ADR07/		607

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			223	0.00	SU08/		608
			224	0.00	RU08/		609
			225	0.00	SU09/		610
			226	0.00	RU09/		611
			228	0.00	SU10/		612
			229	0.00	RD10/		613
			230	0.00	SU11/		614
			231	0.00	RU11/		615
			232	0.00	DMA-PROT /		616
			233	0.00	SD12/		617
			234	0.00	RU12/		618
			235	0.00	SD13/		619
			236	0.00	RD13/		620
			238	0.00	SD14/		621
			239	0.00	RU14/		622
			240	0.00	SD15/		623
			241	0.00	RU15/		624
			243	0.00	SD16/		625
			244	0.00	RD16/		626
			245	0.00	AUR04/		627
			246	0.00	AUR03/		628
			247	0.00	ADR02/		629
			248	0.00	READ-SST 8/		630
			249	0.00	INTP-F/		631
			250	0.00	INTC-F/		632
			252	0.00	DMA-MPE/		633
			253	0.00	DMA-MAd1 1/		634
			254	0.00	DMA-MAd1 2/		635
			255	0.00	DMA-MAd1 3/		636
			256	0.00	DMA-MAB1 4/		637
			257	0.00	DMA-MAB1 5/		638
			258	0.00	DMA-MAB1 6/		639
			259	0.00	DMA1-INT		640
			260	0.00	DMA1-HR/		641
			261	0.00	DMA1-HA/		642
			262	0.00	DMA-MDS/		643
			263	0.00	DMA-MAE/		644
			264	0.00	DFM01		645
			265	0.00	DFM02		646
			266	0.00	DFM03		647
			267	0.00	DFM04		648
			268	0.00	DFM05		649
			269	0.00	DFM06		650
			270	0.00	DFM07		651
			271	0.00	DFM08		652
			272	0.00	DFM09		653
			273	0.00	DFM10		654
			274	0.00	DFM11		655
			275	0.00	DFM12		656
			276	0.00	DFM13		657
			277	0.00	DFM14		658
			278	0.00	DFM15		659

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			279	0.00	DFM16		660
			280	0.00	ADR01/		661
			281	0.00	ADR08/		662
			282	0.00	ADR09/		663
			283	0.00	ADR10/		664
			284	0.00	ADR11/		665
			285	0.00	ADR12/		666
			286	0.00	ADR13/		667
			287	0.00	ADR14/		668
			288	0.00	ADR15/		669
			289	0.00	ADR16/		670
			290	0.00	WRITE/		671
			291	0.00	PROG PRO T/		672
			292	0.00	dE0/		673
	F*	(01)	35	0.00	DMA-MAB1 7/		1651
			36	0.00	DMA1-MAB 10/		1652
			46	0.00	MR/		1653
			47	0.00	DMA-MAB1 9/		1654
			48	0.00	SIERR/		1655
			53	0.00	DMA-MAB0 1/		1656
			54	0.00	DMA-MAB0 2/		1657
			55	0.00	DMA-MAB0 3/		1658
			56	0.00	DMA-MAB0 4/		1659
			57	0.00	DMA-MAB0 5/		1660
			58	0.00	DMA-MAB0 6/		1661
			59	0.00	DMA-MAB0 7/		1662
			60	0.00	DMA-MAB0 8/		1663
			61	0.00	DMA-MAB0 9/		1664
			62	0.00	DMA-MAB1 0/		1665
			63	0.00	DMA-WRIT E		1666
			64	0.00	DMA-DTR0 1/		1667
			65	0.00	DMA-DTR0 2/		1668
			66	0.00	DMA-DTR0 3/		1669
			67	0.00	DMA-DTR0 4/		1670
			68	0.00	DMA-DTR0 5/		1671
			69	0.00	DMA-DTR0 6/		1672
			70	0.00	DMA-DTR0 7/		1673
			71	0.00	DMA-DTR0 8/		1674
			72	0.00	DMA-DTR0 9/		1675
			73	0.00	DMA-DTR1 0/		1676
			74	0.00	DMA-DTR1 1/		1677
			75	0.00	DMA-DTR1 2/		1678
			76	0.00	DMA-DTR1 3/		1679
			77	0.00	DMA-DTR1 4/		1680
			78	0.00	DMA-DTR1 5/		1681
			79	0.00	DMA-DTR1 6/		1682
	6	(01)	203	0.00	SU01/		674
			204	0.00	RU01/		675
			205	0.00	SU02/		676
			206	0.00	RU02/		677

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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				207	0.00	SD03/		678
				208	0.00	RD03/		679
				209	0.00	SD04/		680
				210	0.00	RD04/		681
				211	0.00	SD05/		682
				212	0.00	ADR05/		683
				213	0.00	RTERM/		684
				214	0.00	RD05/		685
				215	0.00	SD06/		686
				216	0.00	REPLY/		687
				217	0.00	ADR06/		688
				218	0.00	RD06/		689
				219	0.00	SD07/		690
				220	0.00	REJECT/		691
				221	0.00	RD07/		692
				222	0.00	ADR07/		693
				223	0.00	SD08/		694
				224	0.00	RD08/		695
				225	0.00	SD09/		696
				226	0.00	RD09/		697
				228	0.00	SD10/		698
				229	0.00	RD10/		699
				230	0.00	SD11/		700
				231	0.00	RD11/		701
				233	0.00	SD12/		702
				234	0.00	RD12/		703
				235	0.00	SD13/		704
				236	0.00	RD13/		705
				238	0.00	SD14/		706
				239	0.00	RD14/		707
				240	0.00	SD15/		708
				241	0.00	RD15/		709
				243	0.00	SD16/		710
				244	0.00	RD16/		711
				245	0.00	ADR04/		712
				246	0.00	ADR03/		713
				247	0.00	ADR02/		714
				248	0.00	READ-SST B/		715
				249	0.00	INTP-G/		716
				250	0.00	INTD-G/		717
				280	0.00	ADR01/		718
				281	0.00	ADR08/		719
				282	0.00	ADR09/		720
				283	0.00	ADR10/		721
				284	0.00	ADR11/		722
				285	0.00	ADR12/		723
				286	0.00	ADR13/		724
				287	0.00	ADR14/		725
				288	0.00	ADR15/		726
				289	0.00	ADR16/		727
				290	0.00	WRITE/		728
				291	0.00	PROG PRO T/		729

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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				292	0.00	WE0/		730
		G*	(01)	46	0.00	RR/		1683
				47	0.00	CHARINPU T/		1684
				48	0.00	STERM/		1685
		H	(01)	203	0.00	SD01/		731
				204	0.00	RD01/		732
				205	0.00	SD02/		733
				206	0.00	RD02/		734
				207	0.00	SD03/		735
				208	0.00	RD03/		736
				209	0.00	SD04/		737
				210	0.00	RD04/		738
				211	0.00	SD05/		739
				212	0.00	ADR05/		740
				213	0.00	RTERM/		741
				214	0.00	RD05/		742
				215	0.00	SD06/		743
				216	0.00	REPLY/		744
				217	0.00	ADR06/		745
				218	0.00	RD06/		746
				219	0.00	SD07/		747
				220	0.00	REJECT/		748
				221	0.00	RD07/		749
				222	0.00	ADR07/		750
				223	0.00	SD08/		751
				224	0.00	RD08/		752
				225	0.00	SD09/		753
				226	0.00	RD09/		754
				228	0.00	SD10/		755
				229	0.00	RD10/		756
				230	0.00	SD11/		757
				231	0.00	RD11/		758
				232	0.00	DMA-PROT /		759
				233	0.00	SD12/		760
				234	0.00	RD12/		761
				235	0.00	SD13/		762
				236	0.00	RD13/		763
				238	0.00	SD14/		764
				239	0.00	RD14/		765
				240	0.00	SD15/		766
				241	0.00	RD15/		767
				243	0.00	SD16/		768
				244	0.00	RD16/		769
				245	0.00	ADR04/		770
				246	0.00	ADR03/		771
				247	0.00	ADR02/		772
				248	0.00	READ-SST B/		773
				249	0.00	INTP-H/		774
				250	0.00	INTD-H/		775
				252	0.00	DMA-MPE/		776

I/O EXPANSION MP32 BACKPLANE
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*** ELEMENT LIST ***

SLI JOB NO. WH5536-B
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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				253	0.00	DMA-MAB1	1/	777
				254	0.00	DMA-MAB1	2/	778
				255	0.00	DMA-MAB1	3/	779
				256	0.00	DMA-MAB1	4/	780
				257	0.00	DMA-MAB1	5/	781
				258	0.00	DMA-MAB1	6/	782
				259	0.00	DMA2-INT		783
				260	0.00	DMA2-MR/		784
				261	0.00	DMA2-RA/		785
				262	0.00	DMA-MOS/		786
				263	0.00	DMA-MAE/		787
				264	0.00	DFM01		788
				265	0.00	DFM02		789
				266	0.00	DFM03		790
				267	0.00	DFM04		791
				268	0.00	DFM05		792
				269	0.00	DFM06		793
				270	0.00	DFM07		794
				271	0.00	DFM08		795
				272	0.00	DFM09		796
				273	0.00	DFM10		797
				274	0.00	DFM11		798
				275	0.00	DFM12		799
				276	0.00	DFM13		800
				277	0.00	DFM14		801
				278	0.00	DFM15		802
				279	0.00	DFM16		803
				280	0.00	AUR01/		804
				281	0.00	AUR08/		805
				282	0.00	AUR09/		806
				283	0.00	AUR10/		807
				284	0.00	AUR11/		808
				285	0.00	AUR12/		809
				286	0.00	AUR13/		810
				287	0.00	AUR14/		811
				288	0.00	AUR15/		812
				289	0.00	AUR16/		813
				290	0.00	WRITE/		814
				291	0.00	PROG PRO	T/	815
				292	0.00	WEO/		816
		H8	(0)	35	0.00	DMA-MAB1	7/	1686
				36	0.00	DMA2-MAB	10/	1687
				46	0.00	MR/		1688
				47	0.00	DMA-MAB1	9/	1689
				48	0.00	STERM/		1690
				53	0.00	DMA-MAB0	1/	1691
				54	0.00	DMA-MAB0	2/	1692
				55	0.00	DMA-MAB0	3/	1693
				56	0.00	DMA-MAB0	4/	1694
				57	0.00	DMA-MAB0	5/	1695
				58	0.00	DMA-MAB0	6/	1696

I/O EXPANSION MP32 BACKPLANE
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*** ELEMENT LIST ***

SLI JOB NO. WH5536-B
DATE 07/10/78 PAGE 14

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				59	0.00	DMA-MAB0	7/	1697
				60	0.00	DMA-MAB0	8/	1698
				61	0.00	DMA-MAB0	9/	1699
				62	0.00	DMA-MAB1	0/	1700
				63	0.00	DMA-WRIT	E	1701
				64	0.00	DMA-DTM0	1/	1702
				65	0.00	DMA-DTM0	2/	1703
				66	0.00	DMA-DTM0	3/	1704
				67	0.00	DMA-DTM0	4/	1705
				68	0.00	DMA-DTM0	5/	1706
				69	0.00	DMA-DTM0	6/	1707
				70	0.00	DMA-DTM0	7/	1708
				71	0.00	DMA-DTM0	8/	1709
				72	0.00	DMA-DTM0	9/	1710
				73	0.00	DMA-DTM1	0/	1711
				74	0.00	DMA-DTM1	1/	1712
				75	0.00	DMA-DTM1	2/	1713
				76	0.00	DMA-DTM1	3/	1714
				77	0.00	DMA-DTM1	4/	1715
				78	0.00	DMA-DTM1	5/	1716
				79	0.00	DMA-DTM1	6/	1717
		J	(0)	203	0.00	SU01/		817
				204	0.00	RU01/		818
				205	0.00	SU02/		819
				206	0.00	RU02/		820
				207	0.00	SU03/		821
				208	0.00	RU03/		822
				209	0.00	SU04/		823
				210	0.00	RU04/		824
				211	0.00	SU05/		825
				212	0.00	AUR05/		826
				213	0.00	RTERM/		827
				214	0.00	RU05/		828
				215	0.00	SU06/		829
				216	0.00	REPLY/		830
				217	0.00	AUR06/		831
				218	0.00	RU06/		832
				219	0.00	SU07/		833
				220	0.00	REJECT/		834
				221	0.00	RU07/		835
				222	0.00	AUR07/		836
				223	0.00	SU08/		837
				224	0.00	RU08/		838
				225	0.00	SU09/		839
				226	0.00	RU09/		840
				228	0.00	SU10/		841
				229	0.00	RU10/		842
				230	0.00	SU11/		843
				231	0.00	RU11/		844
				233	0.00	SU12/		845
				234	0.00	RU12/		846

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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				235	0.00	SD13/		847
				236	0.00	RD13/		848
				238	0.00	SD14/		849
				239	0.00	RD14/		850
				240	0.00	SD15/		851
				241	0.00	RD15/		852
				243	0.00	SD16/		853
				244	0.00	RD16/		854
				245	0.00	ADR04/		855
				246	0.00	ADR03/		856
				247	0.00	ADR02/		857
				248	0.00	READ-SST 6/		858
				249	0.00	INTP-J/		859
				250	0.00	INTD-J/		860
				280	0.00	ADR01/		861
				281	0.00	ADR00/		862
				282	0.00	ADR09/		863
				283	0.00	ADR10/		864
				284	0.00	ADR11/		865
				285	0.00	ADR12/		866
				286	0.00	ADR13/		867
				287	0.00	ADR14/		868
				288	0.00	ADR15/		869
				289	0.00	ADR16/		870
				290	0.00	WRITE/		871
				291	0.00	PROG PRO T/		872
				292	0.00	WE0/		873
		J*	(0)	46	0.00	MR/		1718
				47	0.00	CHARINPU T/		1719
				48	0.00	STERM/		1720
		K	(0)	203	0.00	SD01/		874
				204	0.00	RD01/		875
				205	0.00	SD02/		876
				206	0.00	RD02/		877
				207	0.00	SD03/		878
				208	0.00	RD03/		879
				209	0.00	SD04/		880
				210	0.00	RD04/		881
				211	0.00	SD05/		882
				212	0.00	ADR05/		883
				213	0.00	RTERM/		884
				214	0.00	RD05/		885
				215	0.00	SD06/		886
				216	0.00	REPLY/		887
				217	0.00	ADR06/		888
				218	0.00	RD06/		889
				219	0.00	SD07/		890
				220	0.00	REJECT/		891
				221	0.00	RD07/		892
				222	0.00	ADR07/		893

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WH5538-8
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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				223	0.00	SD08/		894
				224	0.00	RD08/		895
				225	0.00	SD09/		896
				226	0.00	RD09/		897
				228	0.00	SD10/		898
				229	0.00	RD10/		899
				230	0.00	SD11/		900
				231	0.00	RD11/		901
				232	0.00	DMA-PROT /		902
				233	0.00	SD12/		903
				234	0.00	RD12/		904
				235	0.00	SD13/		905
				236	0.00	RD13/		906
				238	0.00	SD14/		907
				239	0.00	RD14/		908
				240	0.00	SD15/		909
				241	0.00	RD15/		910
				243	0.00	SD16/		911
				244	0.00	RD16/		912
				245	0.00	ADR04/		913
				246	0.00	ADR03/		914
				247	0.00	ADR02/		915
				248	0.00	READ-SST 6/		916
				249	0.00	INTP-K/		917
				250	0.00	INTD-K/		918
				252	0.00	DMA-MPE/		919
				253	0.00	DMA-MAB1 1/		920
				254	0.00	DMA-MAB1 2/		921
				255	0.00	DMA-MAB1 3/		922
				256	0.00	DMA-MAB1 4/		923
				257	0.00	DMA-MAB1 5/		924
				258	0.00	DMA-MAB1 6/		925
				259	0.00	DMA3-INT		926
				260	0.00	DMA3-MR/		927
				261	0.00	DMA3-RA/		928
				262	0.00	DMA-MDS/		929
				263	0.00	DMA-MAE/		930
				264	0.00	DFM01		931
				265	0.00	DFM02		932
				266	0.00	DFM03		933
				267	0.00	DFM04		934
				268	0.00	DFM05		935
				269	0.00	DFM06		936
				270	0.00	DFM07		937
				271	0.00	DFM08		938
				272	0.00	DFM09		939
				273	0.00	DFM10		940
				274	0.00	DFM11		941
				275	0.00	DFM12		942
				276	0.00	DFM13		943
				277	0.00	DFM14		944
				278	0.00	DFM15		945

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				279	0.00	DFR16		946
				280	0.00	ADR01/		947
				281	0.00	AUR08/		948
				282	0.00	AUR09/		949
				283	0.00	AUR10/		950
				284	0.00	AUR11/		951
				285	0.00	AUR12/		952
				286	0.00	AUR13/		953
				287	0.00	AUR14/		954
				288	0.00	AUR15/		955
				289	0.00	AUR16/		956
				290	0.00	WRITE/		957
				291	0.00	PROG PRO	T/	958
				292	0.00	WE0/		959
		K*	(0)	35	0.00	DMA-MAB1	7/	1721
				36	0.00	DMA3-MAB	18/	1722
				46	0.00	MR/		1723
				47	0.00	DMA-MAB1	9/	1724
				48	0.00	STERM/		1725
				53	0.00	DMA-MAB0	1/	1726
				54	0.00	DMA-MAB0	2/	1727
				55	0.00	DMA-MAB0	3/	1728
				56	0.00	DMA-MAB0	4/	1729
				57	0.00	DMA-MAB0	5/	1730
				58	0.00	DMA-MAB0	6/	1731
				59	0.00	DMA-MAB0	7/	1732
				60	0.00	DMA-MAB0	8/	1733
				61	0.00	DMA-MAB0	9/	1734
				62	0.00	DMA-MAB1	0/	1735
				63	0.00	DMA-WRIT	E	1736
				64	0.00	DMA-DTM0	1/	1737
				65	0.00	DMA-DTM0	2/	1738
				66	0.00	DMA-DTM0	3/	1739
				67	0.00	DMA-DTM0	4/	1740
				68	0.00	DMA-DTM0	5/	1741
				69	0.00	DMA-DTM0	6/	1742
				70	0.00	DMA-DTM0	7/	1743
				71	0.00	DMA-DTM0	8/	1744
				72	0.00	DMA-DTM0	9/	1745
				73	0.00	DMA-DTM1	0/	1746
				74	0.00	DMA-DTM1	1/	1747
				75	0.00	DMA-DTM1	2/	1748
				76	0.00	DMA-DTM1	3/	1749
				77	0.00	DMA-DTM1	4/	1750
				78	0.00	DMA-DTM1	5/	1751
				79	0.00	DMA-DTM1	6/	1752
		L	(0)	203	0.00	SD01/		960
				204	0.00	RD01/		961
				205	0.00	SD02/		962
				206	0.00	RD02/		963

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				207	0.00	SD03/		964
				208	0.00	RD03/		965
				209	0.00	SD04/		966
				210	0.00	RD04/		967
				211	0.00	SD05/		968
				212	0.00	ADR05/		969
				213	0.00	RTERM/		970
				214	0.00	RD05/		971
				215	0.00	SD06/		972
				216	0.00	REPLY/		973
				217	0.00	ADR06/		974
				218	0.00	RD06/		975
				219	0.00	SD07/		976
				220	0.00	REJECT/		977
				221	0.00	RD07/		978
				222	0.00	ADR07/		979
				223	0.00	SD08/		980
				224	0.00	RD08/		981
				225	0.00	SD09/		982
				226	0.00	RD09/		983
				228	0.00	SD10/		984
				229	0.00	RD10/		985
				230	0.00	SD11/		986
				231	0.00	RD11/		987
				233	0.00	SD12/		988
				234	0.00	RD12/		989
				235	0.00	SD13/		990
				236	0.00	RD13/		991
				238	0.00	SD14/		992
				239	0.00	RD14/		993
				240	0.00	SD15/		994
				241	0.00	RD15/		995
				243	0.00	SD16/		996
				244	0.00	RD16/		997
				245	0.00	ADR04/		998
				246	0.00	ADR03/		999
				247	0.00	ADR02/		1000
				248	0.00	READ-SST	B/	1001
				249	0.00	INTP-LK		1002
				250	0.00	INTD-LK		1003
				280	0.00	ADR01/		1004
				281	0.00	AUR08/		1005
				282	0.00	ADR09/		1006
				283	0.00	ADR10/		1007
				284	0.00	ADR11/		1008
				285	0.00	ADR12/		1009
				286	0.00	ADR13/		1010
				287	0.00	ADR14/		1011
				288	0.00	ADR15/		1012
				289	0.00	ADR16/		1013
				290	0.00	WRITE/		1014
				291	0.00	PROG PRO	T/	1015

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				292	0.00	WE0/		1016
		L*	(0)	46	0.00	MR/		1753
				47	0.00	CHARINPU	T/	1754
				48	0.00	STERM/		1755
		M	(0)	203	0.00	SD01/		1017
				204	0.00	RD01/		1018
				205	0.00	SD02/		1019
				206	0.00	RD02/		1020
				207	0.00	SD03/		1021
				208	0.00	RD03/		1022
				209	0.00	SD04/		1023
				210	0.00	RD04/		1024
				211	0.00	SD05/		1025
				212	0.00	ADR05/		1026
				213	0.00	RTERM/		1027
				214	0.00	RD05/		1028
				215	0.00	SD06/		1029
				216	0.00	REPLY/		1030
				217	0.00	ADR06/		1031
				218	0.00	RD06/		1032
				219	0.00	SD07/		1033
				220	0.00	REJECT/		1034
				221	0.00	RD07/		1035
				222	0.00	ADR07/		1036
				223	0.00	SD08/		1037
				224	0.00	RD08/		1038
				225	0.00	SD09/		1039
				226	0.00	RD09/		1040
				228	0.00	SD10/		1041
				229	0.00	RD10/		1042
				230	0.00	SD11/		1043
				231	0.00	RD11/		1044
				232	0.00	DMA-PROT	/	1045
				233	0.00	SD12/		1046
				234	0.00	RD12/		1047
				235	0.00	SD13/		1048
				236	0.00	RD13/		1049
				238	0.00	SD14/		1050
				239	0.00	RD14/		1051
				240	0.00	SD15/		1052
				241	0.00	RD15/		1053
				243	0.00	SD16/		1054
				244	0.00	RD16/		1055
				245	0.00	ADR04/		1056
				246	0.00	ADR03/		1057
				247	0.00	ADR02/		1058
				248	0.00	READ-SST	B/	1059
				249	0.00	INTP-M/		1060
				250	0.00	INTO-M/		1061
				252	0.00	DMA-MPE/		1062

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				253	0.00	DMA-MAB1	1/	1063
				254	0.00	DMA-MAB1	2/	1064
				255	0.00	DMA-MAB1	3/	1065
				256	0.00	DMA-MAB1	4/	1066
				257	0.00	DMA-MAB1	5/	1067
				258	0.00	DMA-MAB1	6/	1068
				259	0.00	DMA4-INT		1069
				260	0.00	DMA4-MR/		1070
				261	0.00	DMA4-MA/		1071
				262	0.00	DMA-MCS/		1072
				263	0.00	DMA-MAE/		1
				264	0.00	DFM01		2
				265	0.00	DFM02		3
				266	0.00	DFM03		4
				267	0.00	DFM04		5
				268	0.00	DFM05		6
				269	0.00	DFM06		7
				270	0.00	DFM07		8
				271	0.00	DFM08		9
				272	0.00	DFM09		10
				273	0.00	DFM10		11
				274	0.00	DFM11		12
				275	0.00	DFM12		13
				276	0.00	DFM13		14
				277	0.00	DFM14		15
				278	0.00	DFM15		16
				279	0.00	DFM16		17
				280	0.00	ADR01/		18
				281	0.00	ADR08/		19
				282	0.00	ADR09/		20
				283	0.00	ADR10/		21
				284	0.00	ADR11/		22
				285	0.00	ADR12/		23
				286	0.00	ADR13/		24
				287	0.00	ADR14/		25
				288	0.00	ADR15/		26
				289	0.00	ADR16/		27
				290	0.00	WRITE/		28
				291	0.00	PROG PRO	T/	29
				292	0.00	WE0/		30
		M*	(0)	35	0.00	DMA-MAB1	7/	1756
				36	0.00	DMA4-MAB	18/	1757
				46	0.00	MR/		1758
				47	0.00	DMA-MAB1	9/	1759
				48	0.00	STERM/		1760
				53	0.00	DMA-MAB0	1/	1761
				54	0.00	DMA-MAB0	2/	1762
				55	0.00	DMA-MAB0	3/	1763
				56	0.00	DMA-MAB0	4/	1764
				57	0.00	DMA-MAB0	5/	1765
				58	0.00	DMA-MAB0	6/	1766

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WM5536-8
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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT.	SEQ	SEQ NO.
				59	0.00	DMA-MA00	7/		1767
				60	0.00	DMA-MA00	6/		1768
				61	0.00	DMA-MA00	9/		1769
				62	0.00	DMA-MA01	0/		1770
				63	0.00	DMA-WRIT	E		1771
				64	0.00	DMA-DT00	1/		1772
				65	0.00	DMA-DT00	2/		1773
				66	0.00	DMA-DT00	3/		1774
				67	0.00	DMA-DT00	4/		1775
				68	0.00	DMA-DT00	5/		1776
				69	0.00	DMA-DT00	6/		1777
				70	0.00	DMA-DT00	7/		1778
				71	0.00	DMA-DT00	8/		1779
				72	0.00	DMA-DT00	9/		1780
				73	0.00	DMA-DT01	0/		1781
				74	0.00	DMA-DT01	1/		1782
				75	0.00	DMA-DT01	2/		1783
				76	0.00	DMA-DT01	3/		1784
				77	0.00	DMA-DT01	4/		1785
				78	0.00	DMA-DT01	5/		1786
				79	0.00	DMA-DT01	6/		1787
	N		(0)	203	0.00	SD01/			31
				204	0.00	RD01/			32
				205	0.00	SD02/			33
				206	0.00	RD02/			34
				207	0.00	SD03/			35
				208	0.00	RD03/			36
				209	0.00	SD04/			37
				210	0.00	RD04/			38
				211	0.00	SD05/			39
				212	0.00	ADR05/			40
				213	0.00	RTERM/			41
				214	0.00	RD05/			42
				215	0.00	SD06/			43
				216	0.00	REPLY/			44
				217	0.00	ADR06/			45
				218	0.00	RD06/			46
				219	0.00	SD07/			47
				220	0.00	REJECT/			48
				221	0.00	RD07/			49
				222	0.00	ADR07/			50
				223	0.00	SD08/			51
				224	0.00	RD08/			52
				225	0.00	SD09/			53
				226	0.00	RD09/			54
				228	0.00	SD10/			55
				229	0.00	RD10/			56
				230	0.00	SD11/			57
				231	0.00	RD11/			58
				233	0.00	SD12/			59
				234	0.00	RD12/			60

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WM5536-8
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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT.	SEQ	SEQ NO.
				235	0.00	SD13/			61
				236	0.00	RD13/			62
				238	0.00	SD14/			63
				239	0.00	RD14/			64
				240	0.00	SD15/			65
				241	0.00	RD15/			66
				243	0.00	SD16/			67
				244	0.00	RD16/			68
				245	0.00	ADR04/			69
				246	0.00	ADR03/			70
				247	0.00	ADR02/			71
				248	0.00	READ-SST	B/		72
				249	0.00	INTP-N/			73
				250	0.00	INTD-N/			74
				280	0.00	ADR01/			75
				281	0.00	ADR00/			76
				282	0.00	ADR09/			77
				283	0.00	ADR10/			78
				284	0.00	ADR11/			79
				285	0.00	ADR12/			80
				286	0.00	ADR13/			81
				287	0.00	ADR14/			82
				288	0.00	ADR15/			83
				289	0.00	ADR16/			84
				290	0.00	WRITE/			85
				291	0.00	PROG PRO	T/		86
				292	0.00	MEO/			87
		N*	(0)	46	0.00	MA/			1418
				47	0.00	CHARIP.PU	T/		1419
				48	0.00	STERM/			1420
		P	(0)	203	0.00	SD01/			88
				204	0.00	RD01/			89
				205	0.00	SD02/			90
				206	0.00	RD02/			91
				207	0.00	SD03/			92
				208	0.00	RD03/			93
				209	0.00	SD04/			94
				210	0.00	RD04/			95
				211	0.00	SD05/			96
				212	0.00	ADR05/			97
				213	0.00	RTERM/			98
				214	0.00	RD05/			99
				215	0.00	SD06/			100
				216	0.00	REPLY/			101
				217	0.00	ADR06/			102
				218	0.00	RD06/			103
				219	0.00	SD07/			104
				220	0.00	REJECT/			105
				221	0.00	RD07/			106
				222	0.00	ADR07/			107

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				223	0.00	SD08/		108
				224	0.00	RD08/		109
				225	0.00	SD09/		110
				226	0.00	RD09/		111
				228	0.00	SD10/		112
				229	0.00	RD10/		113
				230	0.00	SD11/		114
				231	0.00	RD11/		115
				232	0.00	DMA-PROT	/	116
				233	0.00	SD12/		117
				234	0.00	RD12/		118
				235	0.00	SD13/		119
				236	0.00	RD13/		120
				238	0.00	SD14/		121
				239	0.00	RD14/		122
				240	0.00	SD15/		123
				241	0.00	RD15/		124
				243	0.00	SD16/		125
				244	0.00	RD16/		126
				245	0.00	ADR04/		127
				246	0.00	ADR03/		128
				247	0.00	ADR02/		129
				248	0.00	READ-SST	B/	130
				249	0.00	INTP-P/		131
				250	0.00	INTD-P/		132
				252	0.00	DMA-MPE/		133
				253	0.00	DMA-MAB1	1/	134
				254	0.00	DMA-MAB1	2/	135
				255	0.00	DMA-MAB1	3/	136
				256	0.00	DMA-MAB1	4/	137
				257	0.00	DMA-MAB1	5/	138
				258	0.00	DMA-MAB1	6/	139
				259	0.00	DMA5-INT		140
				260	0.00	DMA5-MR/		141
				261	0.00	DMA5-MA/		142
				262	0.00	DMA-MDS/		143
				263	0.00	DMA-MAE/		144
				264	0.00	DFM01		145
				265	0.00	DFM02		146
				266	0.00	DFM03		147
				267	0.00	DFM04		148
				268	0.00	DFM05		149
				269	0.00	DFM06		150
				270	0.00	DFM07		151
				271	0.00	DFM08		152
				272	0.00	DFM09		153
				273	0.00	DFM10		154
				274	0.00	DFM11		155
				275	0.00	DFM12		156
				276	0.00	DFM13		157
				277	0.00	DFM14		158
				278	0.00	DFM15		159

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				279	0.00	DFM16		160
				280	0.00	AUR01/		161
				281	0.00	AUR08/		162
				282	0.00	AUR09/		163
				283	0.00	AUR10/		164
				284	0.00	AUR11/		165
				285	0.00	AUR12/		166
				286	0.00	AUR13/		167
				287	0.00	AUR14/		168
				288	0.00	AUR15/		169
				289	0.00	AUR16/		170
				290	0.00	WRITE/		171
				291	0.00	PROG PRO	T/	172
				292	0.00	SEO/		173
	P*		(0)	35	0.00	DMA-MAB1	7/	1421
				36	0.00	DMA5-MAB	18/	1422
				46	0.00	MR/		1423
				47	0.00	DMA-MAB1	9/	1424
				48	0.00	STERM/		1425
				53	0.00	DMA-MAB0	1/	1426
				54	0.00	DMA-MAB0	2/	1427
				55	0.00	DMA-MAB0	3/	1428
				56	0.00	DMA-MAB0	4/	1429
				57	0.00	DMA-MAB0	5/	1430
				58	0.00	DMA-MAB0	6/	1431
				59	0.00	DMA-MAB0	7/	1432
				60	0.00	DMA-MAB0	8/	1433
				61	0.00	DMA-MABL	9/	1434
				62	0.00	DMA-MAB1	0/	1435
				63	0.00	DMA-WRIT	E	1436
				64	0.00	DMA-DTM0	1/	1437
				65	0.00	DMA-DTM0	2/	1438
				66	0.00	DMA-DTM0	3/	1439
				67	0.00	DMA-DTM0	4/	1440
				68	0.00	DMA-DTM0	5/	1441
				69	0.00	DMA-DTM0	6/	1442
				70	0.00	DMA-DTM0	7/	1443
				71	0.00	DMA-DTM0	8/	1444
				72	0.00	DMA-DTM0	9/	1445
				73	0.00	DMA-DTM1	0/	1446
				74	0.00	DMA-DTM1	1/	1447
				75	0.00	DMA-DTM1	2/	1448
				76	0.00	DMA-DTM1	3/	1449
				77	0.00	DMA-DTM1	4/	1450
				78	0.00	DMA-DTM1	5/	1451
				79	0.00	DMA-DTM1	6/	1452
	R		(0)	203	0.00	SD01/		174
				204	0.00	RD01/		175
				205	0.00	SD02/		176
				206	0.00	RD02/		177

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				207	0.00	SU03/		178
				208	0.00	RU03/		179
				209	0.00	SU04/		180
				210	0.00	RU04/		181
				211	0.00	SU05/		182
				212	0.00	ADR05/		183
				213	0.00	RTERM/		184
				214	0.00	RU05/		185
				215	0.00	SU06/		186
				216	0.00	REPLY/		187
				217	0.00	ADR06/		188
				218	0.00	RU06/		189
				219	0.00	SU07/		190
				220	0.00	REJECT/		191
				221	0.00	RU07/		192
				222	0.00	ADR07/		193
				223	0.00	SU08/		194
				224	0.00	RU08/		195
				225	0.00	SU09/		196
				226	0.00	RU09/		197
				228	0.00	SU10/		198
				229	0.00	RU10/		199
				230	0.00	SU11/		200
				231	0.00	RU11/		201
				233	0.00	SU12/		202
				234	0.00	RU12/		203
				235	0.00	SU13/		204
				236	0.00	RU13/		205
				238	0.00	SU14/		206
				239	0.00	RU14/		207
				240	0.00	SU15/		208
				241	0.00	RU15/		209
				243	0.00	SU16/		210
				244	0.00	RU16/		211
				245	0.00	ADR04/		212
				246	0.00	ADR03/		213
				247	0.00	ADR02/		214
				248	0.00	READ-SST B/		215
				249	0.00	INTP-R/		216
				250	0.00	INTD-R/		217
				280	0.00	ADR01/		218
				281	0.00	ADR08/		219
				282	0.00	ADR09/		220
				283	0.00	ADR10/		221
				284	0.00	ADR11/		222
				285	0.00	ADR12/		223
				286	0.00	ADR13/		224
				287	0.00	ADR14/		225
				288	0.00	ADR15/		226
				289	0.00	ADR16/		227
				290	0.00	WRITE/		228
				291	0.00	PROG PRO T/		229

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				292	0.00	WEO/		230
		R*	(0)	46	0.00	MR/		1453
				47	0.00	CHARINPU T/		1454
				48	0.00	STERM/		1455
		S	(0)	203	0.00	SU01/		231
				204	0.00	RU01/		232
				205	0.00	SU02/		233
				206	0.00	RU02/		234
				207	0.00	SU03/		235
				208	0.00	RU03/		236
				209	0.00	SU04/		237
				210	0.00	RU04/		238
				211	0.00	SU05/		239
				212	0.00	ADR05/		240
				213	0.00	RTERM/		241
				214	0.00	RU05/		242
				215	0.00	SU06/		243
				216	0.00	REPLY/		244
				217	0.00	ADR06/		245
				218	0.00	RU06/		246
				219	0.00	SU07/		247
				220	0.00	REJECT/		248
				221	0.00	RU07/		249
				222	0.00	ADR07/		250
				223	0.00	SU08/		251
				224	0.00	RU08/		252
				225	0.00	SU09/		253
				226	0.00	RU09/		254
				228	0.00	SU10/		255
				229	0.00	RU10/		256
				230	0.00	SU11/		257
				231	0.00	RU11/		258
				232	0.00	DMA-PROT /		259
				233	0.00	SU12/		260
				234	0.00	RU12/		261
				235	0.00	SU13/		262
				236	0.00	RU13/		263
				238	0.00	SU14/		264
				239	0.00	RU14/		265
				240	0.00	SU15/		266
				241	0.00	RU15/		267
				243	0.00	SU16/		268
				244	0.00	RU16/		269
				245	0.00	ADR04/		270
				246	0.00	ADR03/		271
				247	0.00	ADR02/		272
				248	0.00	READ-SST B/		273
				249	0.00	INTP-S/		274
				250	0.00	INTD-S/		275
				252	0.00	DMA-MPE/		276

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. [illegible]
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IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			253	0.00	DMA-MAB1	1/	277
			254	0.00	DMA-MAB1	2/	278
			255	0.00	DMA-MAB1	3/	279
			256	0.00	DMA-MAB1	4/	280
			257	0.00	DMA-MAB1	5/	281
			258	0.00	DMA-MAB1	6/	282
			259	0.00	DMA6-IN1		283
			260	0.00	DMA6-MR/		284
			261	0.00	DMA6-MA/		285
			262	0.00	DMA-MDS/		286
			263	0.00	DMA-MAE/		287
			264	0.00	DFM01		288
			265	0.00	DFM02		289
			266	0.00	DFM03		290
			267	0.00	DFM04		291
			268	0.00	DFM05		292
			269	0.00	DFM06		293
			270	0.00	DFM07		294
			271	0.00	DFM08		295
			272	0.00	DFM09		296
			273	0.00	DFM10		297
			274	0.00	DFM11		298
			275	0.00	DFM12		299
			276	0.00	DFM13		300
			277	0.00	DFM14		301
			278	0.00	DFM15		302
			279	0.00	DFM16		303
			280	0.00	ADR01/		304
			281	0.00	ADR08/		305
			282	0.00	ADR09/		306
			283	0.00	ADR10/		307
			284	0.00	ADR11/		308
			285	0.00	ADR12/		309
			286	0.00	ADR13/		310
			287	0.00	ADR14/		311
			288	0.00	ADR15/		312
			289	0.00	ADR16/		313
			290	0.00	WRITE/		314
			291	0.00	PROG PRO	T/	315
			292	0.00	*E0/		316
	S*	(0)	35	0.00	DMA-MAB1	7/	1456
			36	0.00	DMA6-MAB	18/	1457
			46	0.00	MR/		1458
			47	0.00	DMA-MAB1	9/	1459
			48	0.00	STERM/		1460
			53	0.00	DMA-MAB0	1/	1461
			54	0.00	DMA-MAB0	2/	1462
			55	0.00	DMA-MAB0	3/	1463
			56	0.00	DMA-MAB0	4/	1464
			57	0.00	DMA-MAB0	5/	1465
			58	0.00	DMA-MAB0	6/	1466

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			59	0.00	DMA-MAB0	7/	1467
			60	0.00	DMA-MAB0	8/	1468
			61	0.00	DMA-MAB0	9/	1469
			62	0.00	DMA-MAB1	0/	1470
			63	0.00	DMA-WRIT	E	1471
			64	0.00	DMA-DTB0	1/	1472
			65	0.00	DMA-DTB0	2/	1473
			66	0.00	DMA-DTB0	3/	1474
			67	0.00	DMA-DTB0	4/	1475
			68	0.00	DMA-DTB0	5/	1476
			69	0.00	DMA-DTB0	6/	1477
			70	0.00	DMA-DTB0	7/	1478
			71	0.00	DMA-DTB0	8/	1479
			72	0.00	DMA-DTB0	9/	1480
			73	0.00	DMA-DTB1	0/	1481
			74	0.00	DMA-DTB1	1/	1482
			75	0.00	DMA-DTB1	2/	1483
			76	0.00	DMA-DTB1	3/	1484
			77	0.00	DMA-DTB1	4/	1485
			78	0.00	DMA-DTB1	5/	1486
			79	0.00	DMA-DTB1	6/	1487
	T	(0)	203	0.00	SD01/		317
			204	0.00	RD01/		318
			205	0.00	SD02/		319
			206	0.00	RD02/		320
			207	0.00	SD03/		321
			208	0.00	RD03/		322
			209	0.00	SD04/		323
			210	0.00	RD04/		324
			211	0.00	SD05/		325
			212	0.00	ADR05/		326
			213	0.00	RTERM/		327
			214	0.00	RD05/		328
			215	0.00	SD06/		329
			216	0.00	REPLY/		330
			217	0.00	ADR06/		331
			218	0.00	RD06/		332
			219	0.00	SD07/		333
			220	0.00	REJECT/		334
			221	0.00	RD07/		335
			222	0.00	ADR07/		336
			223	0.00	SD08/		337
			224	0.00	RD08/		338
			225	0.00	SD09/		339
			226	0.00	RD09/		340
			228	0.00	SD10/		341
			229	0.00	RD10/		342
			230	0.00	SD11/		343
			231	0.00	RD11/		344
			233	0.00	SD12/		345
			234	0.00	RD12/		346

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				235	0.00	SD13/		347
				236	0.00	RD13/		348
				238	0.00	SD14/		349
				239	0.00	RD14/		350
				240	0.00	SD15/		351
				241	0.00	RD15/		352
				243	0.00	SD16/		353
				244	0.00	RD16/		354
				245	0.00	ADR04/		355
				246	0.00	ADR03/		356
				247	0.00	ADR02/		357
				248	0.00	READ-SST	B/	358
				249	0.00	INTP-T/		359
				250	0.00	INTD-T/		360
				260	0.00	ADR01/		361
				281	0.00	ADR08/		362
				282	0.00	ADR09/		363
				283	0.00	ADR10/		364
				284	0.00	ADR11/		365
				285	0.00	ADR12/		366
				286	0.00	ADR13/		367
				287	0.00	ADR14/		368
				288	0.00	ADR15/		369
				289	0.00	ADR16/		370
				290	0.00	WRITE/		371
				291	0.00	PROG PRO	T/	372
				292	0.00	GND/		373
	T*		(0)	46	0.00	MR/		1488
				47	0.00	CHARINPU	T/	1489
				48	0.00	STERM/		1490
	U		(0)	203	0.00	SD01/		374
				204	0.00	RD01/		375
				205	0.00	SD02/		376
				206	0.00	RD02/		377
				207	0.00	SD03/		378
				208	0.00	RD03/		379
				209	0.00	SD04/		380
				210	0.00	RD04/		381
				211	0.00	SD05/		382
				212	0.00	ACK05/		383
				213	0.00	RTERM/		384
				214	0.00	RD05/		385
				215	0.00	SD06/		386
				216	0.00	REPLY/		387
				217	0.00	ADR06/		388
				218	0.00	RD06/		389
				219	0.00	SD07/		390
				220	0.00	REJECT/		391
				221	0.00	RD07/		392
				222	0.00	ADR07/		393

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				223	0.00	SD08/		394
				224	0.00	RD08/		395
				225	0.00	SD09/		396
				226	0.00	RD09/		397
				228	0.00	SD10/		398
				229	0.00	RD10/		399
				230	0.00	SD11/		400
				231	0.00	RD11/		401
				232	0.00	DMA-PROT	/	402
				233	0.00	SD12/		403
				234	0.00	RD12/		404
				235	0.00	SD13/		405
				236	0.00	RD13/		406
				238	0.00	SD14/		407
				239	0.00	RD14/		408
				240	0.00	SD15/		409
				241	0.00	RD15/		410
				243	0.00	SD16/		411
				244	0.00	RD16/		412
				245	0.00	ADR04/		413
				246	0.00	ADR03/		414
				247	0.00	ADR02/		415
				248	0.00	READ-SST	B/	416
				249	0.00	INTP-D/		417
				250	0.00	INTD-D/		418
				252	0.00	DMA-MPE/		419
				253	0.00	DMA-MAB1	1/	420
				254	0.00	DMA-MAB1	2/	421
				255	0.00	DMA-MAB1	3/	422
				256	0.00	DMA-MAB1	4/	423
				257	0.00	DMA-MAB1	5/	424
				258	0.00	DMA-MAB1	6/	425
				259	0.00	DMA7-INT		426
				260	0.00	DMA7-MR/		427
				261	0.00	DMA7-MA/		428
				262	0.00	DMA-MDS/		429
				263	0.00	DMA-MAE/		430
				264	0.00	DFM01		431
				265	0.00	DFM02		432
				266	0.00	DFM03		433
				267	0.00	DFM04		434
				268	0.00	DFM05		435
				269	0.00	DFM06		436
				270	0.00	DFM07		437
				271	0.00	DFM08		438
				272	0.00	DFM09		439
				273	0.00	DFM10		440
				274	0.00	DFM11		441
				275	0.00	DFM12		442
				276	0.00	DFM13		443
				277	0.00	DFM14		444
				278	0.00	DFM15		445

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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				279	0.00	DFR16		446
				280	0.00	ADR01/		447
				281	0.00	ADR08/		448
				282	0.00	ADR09/		449
				283	0.00	ADR10/		450
				284	0.00	ADR11/		451
				285	0.00	ADR12/		452
				286	0.00	ADR13/		453
				287	0.00	ADR14/		454
				288	0.00	ADR15/		455
				289	0.00	ADR16/		456
				290	0.00	WRITE/		457
				291	0.00	PROG PRO	T/	458
				292	0.00	WE0/		459
	U*	(01		35	0.00	DMA-MAB1	7/	1491
				36	0.00	DMA7-MAB	18/	1492
				46	0.00	MR/		1493
				47	0.00	DMA-MAB1	9/	1494
				48	0.00	SIERR/		1495
				53	0.00	DMA-MAB0	1/	1496
				54	0.00	DMA-MAB0	2/	1497
				55	0.00	DMA-MAB0	3/	1498
				56	0.00	DMA-MAB0	4/	1499
				57	0.00	DMA-MAB0	5/	1500
				58	0.00	DMA-MAB0	6/	1501
				59	0.00	DMA-MAB0	7/	1502
				60	0.00	DMA-MAB0	8/	1503
				61	0.00	DMA-MAB0	9/	1504
				62	0.00	DMA-MAB1	0/	1505
				63	0.00	DMA-WRIT	E	1506
				64	0.00	DMA-DTR0	1/	1507
				65	0.00	DMA-DTR0	2/	1508
				66	0.00	DMA-DTR0	3/	1509
				67	0.00	DMA-DTR0	4/	1510
				68	0.00	DMA-DTR0	5/	1511
				69	0.00	DMA-DTR0	6/	1512
				70	0.00	DMA-DTR0	7/	1513
				71	0.00	DMA-DTR0	8/	1514
				72	0.00	DMA-DTR0	9/	1515
				73	0.00	DMA-DTR1	0/	1516
				74	0.00	DMA-DTR1	1/	1517
				75	0.00	DMA-DTR1	2/	1518
				76	0.00	DMA-DTR1	3/	1519
				77	0.00	DMA-DTR1	4/	1520
				78	0.00	DMA-DTR1	5/	1521
				79	0.00	DMA-DTR1	6/	1522
	V	(01		203	0.00	SU01/		460
				204	0.00	RU01/		461
				205	0.00	SU02/		462
				206	0.00	RU02/		463

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IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				207	0.00	SU03/		464
				208	0.00	RU03/		465
				209	0.00	SU04/		466
				210	0.00	RU04/		467
				211	0.00	SU05/		468
				212	0.00	ADR05/		469
				213	0.00	RTERM/		470
				214	0.00	RU05/		471
				215	0.00	SU06/		472
				216	0.00	REPLY/		473
				217	0.00	ADR06/		474
				218	0.00	RU06/		475
				219	0.00	SU07/		476
				220	0.00	REJECT/		477
				221	0.00	RU07/		478
				222	0.00	ADR07/		479
				223	0.00	SU08/		480
				224	0.00	RU08/		481
				225	0.00	SU09/		482
				226	0.00	RU09/		483
				228	0.00	SU10/		484
				229	0.00	RU10/		485
				230	0.00	SU11/		486
				231	0.00	RU11/		487
				233	0.00	SU12/		488
				234	0.00	RU12/		489
				235	0.00	SU13/		490
				236	0.00	RU13/		491
				238	0.00	SU14/		492
				239	0.00	RU14/		493
				240	0.00	SU15/		494
				241	0.00	RU15/		495
				243	0.00	SU16/		496
				244	0.00	RU16/		497
				245	0.00	ADR04/		498
				246	0.00	ADR03/		499
				247	0.00	ADR02/		500
				248	0.00	READ-SST	B/	501
				249	0.00	INTP-V/		502
				250	0.00	INTD-V/		503
				280	0.00	ADR01/		504
				281	0.00	ADR08/		505
				282	0.00	ADR09/		506
				283	0.00	ADR10/		507
				284	0.00	ADR11/		508
				285	0.00	ADR12/		509
				286	0.00	ADR13/		510
				287	0.00	ADR14/		511
				288	0.00	ADR15/		512
				289	0.00	ADR16/		513
				290	0.00	WRITE/		514
				291	0.00	PROG PRO	T/	515

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			202	0.00	WEO/		516
	V*	(0)	46	0.00	MR/		1523
			47	0.00	CHARINPU T/		1524
			48	0.00	STERM/		1525
	M	(0)	203	0.00	SD01/		517
			204	0.00	RD01/		518
			205	0.00	SD02/		519
			206	0.00	RD02/		520
			207	0.00	SD03/		521
			208	0.00	RD03/		522
			209	0.00	SD04/		523
			210	0.00	RD04/		524
			211	0.00	SD05/		525
			212	0.00	ADR05/		526
			213	0.00	RTERM/		527
			214	0.00	RD05/		528
			215	0.00	SD06/		529
			216	0.00	REPLY/		530
			217	0.00	ADR06/		531
			218	0.00	RD06/		532
			219	0.00	SD07/		533
			220	0.00	REJECT/		534
			221	0.00	RD07/		535
			222	0.00	ADR07/		536
			223	0.00	SD08/		537
			224	0.00	RD08/		538
			225	0.00	SD09/		539
			226	0.00	RD09/		540
			228	0.00	SD10/		541
			229	0.00	RD10/		1073
			230	0.00	SD11/		1074
			231	0.00	RD11/		1075
			232	0.00	DMA-PROT /		1076
			233	0.00	SD12/		1077
			234	0.00	RD12/		1078
			235	0.00	SD13/		1079
			236	0.00	RD13/		1080
			238	0.00	SD14/		1081
			239	0.00	RD14/		1082
			240	0.00	SD15/		1083
			241	0.00	RD15/		1084
			243	0.00	SD16/		1085
			244	0.00	RD16/		1086
			245	0.00	ADR04/		1087
			246	0.00	ADR03/		1088
			247	0.00	ADR02/		1089
			248	0.00	READ-SST B/		1090
			249	0.00	INIP-M/		1091
			250	0.00	INTD-M/		1092
			252	0.00	DMA-MPE/		1093

IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			253	0.00	DMA-MAB1 1/		1094
			254	0.00	DMA-MAB1 2/		1095
			255	0.00	DMA-MAB1 3/		1096
			256	0.00	DMA-MAB1 4/		1097
			257	0.00	DMA-MAB1 5/		1098
			258	0.00	DMA-MAB1 6/		1099
			259	0.00	DMA8-INT		1100
			260	0.00	DMA8-MR/		1101
			261	0.00	DMA8-RA/		1102
			262	0.00	DMA-MDS/		1103
			263	0.00	DMA-MAE/		1104
			264	0.00	DFM01		1105
			265	0.00	DFM02		1106
			266	0.00	DFM03		1107
			267	0.00	DFM04		1108
			268	0.00	DFM05		1109
			269	0.00	DFM06		1110
			270	0.00	DFM07		1111
			271	0.00	DFM08		1112
			272	0.00	DFM09		1113
			273	0.00	DFM10		1114
			274	0.00	DFM11		1115
			275	0.00	DFM12		1116
			276	0.00	DFM13		1117
			277	0.00	DFM14		1118
			278	0.00	DFM15		1119
			279	0.00	DFM16		1120
			280	0.00	ADR01/		1121
			281	0.00	ADR08/		1122
			282	0.00	ADR09/		1123
			283	0.00	ADR10/		1124
			284	0.00	ADR11/		1125
			285	0.00	ADR12/		1126
			286	0.00	ADR13/		1127
			287	0.00	ADR14/		1128
			288	0.00	ADR15/		1129
			289	0.00	ADR16/		1130
			290	0.00	WRITE/		1131
			291	0.00	PROG PRO T/		1132
			292	0.00	WEO/		1133
	W*	(0)	35	0.00	DMA-MAB1 7/		1526
			36	0.00	DMA8-MAB 18/		1527
			46	0.00	MR/		1528
			47	0.00	DMA-MAB1 9/		1529
			48	0.00	STERM/		1530
			53	0.00	DMA-MAB0 1/		1531
			54	0.00	DMA-MAB0 2/		1532
			55	0.00	DMA-MAB0 3/		1533
			56	0.00	DMA-MAB0 4/		1534
			57	0.00	DMA-MAB0 5/		1535
			58	0.00	DMA-MAB0 6/		1536

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				59	0.00	DMA-MAB0	7/	1537
				60	0.00	DMA-MAB0	8/	1538
				61	0.00	DMA-MAB0	9/	1539
				62	0.00	DMA-MAB1	0/	1540
				63	0.00	DMA-WRIT	E	1541
				64	0.00	DMA-DTR0	1/	1542
				65	0.00	DMA-DTR0	2/	1543
				66	0.00	DMA-DTR0	3/	1544
				67	0.00	DMA-DTR0	4/	1545
				68	0.00	DMA-DTR0	5/	1546
				69	0.00	DMA-DTR0	6/	1547
				70	0.00	DMA-DTR0	7/	1548
				71	0.00	DMA-DTR0	8/	1549
				72	0.00	DMA-DTR0	9/	1550
				73	0.00	DMA-DTR1	0/	1551
				74	0.00	DMA-DTR1	1/	1552
				75	0.00	DMA-DTR1	2/	1553
				76	0.00	DMA-DTR1	3/	1554
				77	0.00	DMA-DTR1	4/	1555
				78	0.00	DMA-DTR1	5/	1556
				79	0.00	DMA-DTR1	6/	1557
		X	(0)	203	0.00	SD01/		1134
				204	0.00	RL01/		1135
				205	0.00	SD02/		1136
				206	0.00	RD02/		1137
				207	0.00	SD03/		1138
				208	0.00	RD03/		1139
				209	0.00	SD04/		1140
				210	0.00	RD04/		1141
				211	0.00	SD05/		1142
				212	0.00	ADR05/		1143
				213	0.00	RTERM/		1144
				214	0.00	RD05/		1145
				215	0.00	SD06/		1146
				216	0.00	REPLY/		1147
				217	0.00	ADR06/		1148
				218	0.00	RD06/		1149
				219	0.00	SD07/		1150
				220	0.00	REJECT/		1151
				221	0.00	RD07/		1152
				222	0.00	ADR07/		1153
				223	0.00	SD08/		1154
				224	0.00	RD08/		1155
				225	0.00	SD09/		1156
				226	0.00	RD09/		1157
				228	0.00	SD10/		1158
				229	0.00	RD10/		1159
				230	0.00	SD11/		1160
				231	0.00	RD11/		1161
				232	0.00	SD12/		1162
				234	0.00	RD12/		1163

IC	TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
				235	0.00	SD13/		1164
				236	0.00	RD13/		1165
				238	0.00	SD14/		1166
				239	0.00	RD14/		1167
				240	0.00	SD15/		1168
				241	0.00	RD15/		1169
				243	0.00	SD16/		1170
				244	0.00	RD16/		1171
				245	0.00	ADR04/		1172
				246	0.00	ADR03/		1173
				247	0.00	ADR02/		1174
				248	0.00	READ-SST	B/	1175
				249	0.00	INTP-X/		1176
				250	0.00	INTD-X/		1177
				280	0.00	ADR01/		1178
				281	0.00	ADR08/		1179
				282	0.00	ADR09/		1180
				283	0.00	ADR10/		1181
				284	0.00	ADR11/		1182
				285	0.00	ADR12/		1183
				286	0.00	ADR13/		1184
				287	0.00	ADR14/		1185
				288	0.00	ADR15/		1186
				289	0.00	ADR16/		1187
				290	0.00	WRITE/		1188
				291	0.00	PROG PRO	T/	1189
				292	0.00	WLO/		1190
		X*	(0)	46	0.00	MR/		1559
				47	0.00	CHARINPU	T/	1560
				48	0.00	STERM/		1561
		Y	(0)	253	0.00	INT2E/		1213
				254	0.00	INT4E/		1214
				255	0.00	INT6E/		1215
				256	0.00	INT8E/		1216
				257	0.00	SPT01/		1218
				258	0.00	SPT02/		1219
				259	0.00	XINT2/		1191
				260	0.00	XINT4/		1192
				261	0.00	XINT6/		1193
				262	0.00	XINT8/		1194
				270	0.00	RPINTYY/		1195
				271	0.00	INTD-F/		1197
				272	0.00	INTD-G/		1198
				273	0.00	INTD-H/		1199
				274	0.00	INTD-J/		1200
				275	0.00	INTD-K/		1201
				276	0.00	INTD-L/		1202
				277	0.00	INTD-M/		1203
				278	0.00	INTD-N/		1204
				279	0.00	INTD-P/		1205

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IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			260	0.00	INTD-R/		1206
			261	0.00	INTD-S/		1207
			262	0.00	INTD-T/		1208
			263	0.00	INTD-U/		1209
			264	0.00	INTD-V/		1210
			265	0.00	INTD-W/		1211
			266	0.00	INTD-X/		1212
			267	0.00	MOS-INTD /		1196
			268	0.00	MOS-SPT/		1217
	Y*	(0)	53	0.00	INT1E/		1584
			54	0.00	INT3E/		1585
			55	0.00	INT5E/		1586
			56	0.00	INT7E/		1587
			57	0.00	SSEL01/		1589
			58	0.00	SSEL02/		1590
			59	0.00	XINT1/		1562
			60	0.00	XINT3/		1563
			61	0.00	XINT5/		1564
			62	0.00	XINT7/		1565
			70	0.00	RPINTAX/		1566
			71	0.00	INTP-F/		1568
			72	0.00	INTP-G/		1569
			73	0.00	INTP-H/		1570
			74	0.00	INTP-J/		1571
			75	0.00	INTP-K/		1572
			76	0.00	INTP-L/		1573
			77	0.00	INTP-M/		1574
			78	0.00	INTP-N/		1575
			79	0.00	INTP-P/		1576
			80	0.00	INTP-R/		1577
			81	0.00	INTP-S/		1578
			82	0.00	INTP-T/		1579
			83	0.00	INTP-U/		1580
			84	0.00	INTP-V/		1581
			85	0.00	INTP-W/		1582
			86	0.00	INTP-X/		1583
			87	0.00	MOS-INTP /		1567
			88	0.00	MOS-SSEL /		1588
	Z	(8)	253	0.00	RM/		1220
			254	0.00	CHARINPU T/		1221
			255	0.00	STERM/		1222
			258	0.00	RD11/		1223
			259	0.00	SD12/		1224
			260	0.00	INT2E/		1225
			261	0.00	INT3E/		1226
			262	0.00	INT4E/		1227
			263	0.00	INT6E/		1228
			264	0.00	INT7E/		1229
			265	0.00	INT8E/		1230
	Z*	(8)	8	0.00	SD01/		1591

I/O EXPANSION MP32 BACKPLANE — SLI JOB NO. WH5538-8
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IC TYPE	SOCKET	IC PIN	SKT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			4	0.00	RD01/		1592
			5	0.00	SD02/		1593
			6	0.00	RD02/		1594
			7	0.00	SD03/		1595
			8	0.00	RD03/		1596
			9	0.00	SD04/		1597
			23	0.00	RD04/		1598
			24	0.00	SD05/		1599
			25	0.00	ADR05/		1600
			26	0.00	RTERM/		1601
			27	0.00	RD05/		1602
			28	0.00	SD06/		1603
			29	0.00	REPLY/		1604
			30	0.00	ADR06/		1605
			31	0.00	RD06/		1606
			32	0.00	SD07/		1607
			33	0.00	REJECT/		1608
			34	0.00	RD07/		1609
			35	0.00	ADR07/		1610
			53	0.00	SD08/		1611
			54	0.00	RD08/		1612
			55	0.00	SD09/		1613
			56	0.00	RD09/		1614
			57	0.00	SPT01/		1644
			58	0.00	SD10/		1615
			59	0.00	RD10/		1616
			60	0.00	SD11/		1617
			63	0.00	RD12/		1618
			64	0.00	SD13/		1619
			65	0.00	RD13/		1620
			66	0.00	SD14/		1621
			67	0.00	RD14/		1622
			68	0.00	SD15/		1623
			69	0.00	RD15/		1624
			70	0.00	SD16/		1625
			71	0.00	RD16/		1626
			72	0.00	ADR04/		1627
			73	0.00	ADR03/		1628
			74	0.00	ADR02/		1629
			75	0.00	READ-SST B/		1630
			76	0.00	INT1E/		1645
			77	0.00	INT5E/		1646
			78	0.00	SSEL01/		1647
			79	0.00	SPT02/		1648
			80	0.00	ADR01/		1631
			81	0.00	ADR08/		1632
			82	0.00	ADR09/		1633
			83	0.00	ADR10/		1634
			84	0.00	ADR11/		1635
			85	0.00	ADR12/		1636
			86	0.00	ADR13/		1637
			87	0.00	ADR14/		1638

I/O EXPANSION MP32 BACKPLANE — BLI JOB NO. WH5538-B
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IC TYPE	SOCKET	IC PIN	SNT PIN	S/L	SIGNAL	OPT. SEQ	SEQ NO.
			88	0.00	AUR15/		1639
			89	0.00	AUR16/		1640
			90	0.00	WRITE/		1641
			91	0.00	PROG PRO T/		1642
			92	0.00	WEQ/		1643
			96	0.00	SSEL02/		1649
			99	0.00	AW-GND		1650
			101	0.00	AW-GND		1658

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-E
CDC/LA JOLLA — *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
ADR01/			AC*	80		(0)	0.00			
			AB	280		(0)	0.00	1	1	1.50
			AA	280		(0)	0.00	2	2	1.50
			Z*	80		(0)	0.00	1	3	1.75
			X	280		(0)	0.00	2	4	2.00
			W	280		(0)	0.00	1	5	1.50
			V	280		(0)	0.00	2	6	1.50
			U	280		(0)	0.00	1	7	1.50
			T	280		(0)	0.00	2	8	1.50
			S	280		(0)	0.00	1	9	1.50
			K	280		(0)	0.00	2	10	1.50
			P	280		(0)	0.00	1	11	1.50
			N	280		(0)	0.00	2	12	1.50
			M	280		(0)	0.00	1	13	1.50
			L	280		(0)	0.00	2	14	1.50
			K	280		(0)	0.00	1	15	1.50
			J	280		(0)	0.00	2	16	1.50
			H	280		(0)	0.00	1	17	1.50
			G	280		(0)	0.00	2	18	1.50
			F	280		(0)	0.00	1	19	1.50
						SREM	0.00			29.25
ADR02/			AC*	74		(0)	0.00			
			Z*	74		(0)	0.00	1	20	3.00
			AA	247		(0)	0.00	2	21	5.50
			AB	247		(0)	0.00	1	22	1.50
			X	247		(0)	0.00	2	23	3.50
			W	247		(0)	0.00	1	24	1.50
			V	247		(0)	0.00	2	25	1.50
			U	247		(0)	0.00	1	26	1.50
			T	247		(0)	0.00	2	27	1.50
			S	247		(0)	0.00	1	28	1.50
			R	247		(0)	0.00	2	29	1.50
			P	247		(0)	0.00	1	30	1.50
			N	247		(0)	0.00	2	31	1.50
			M	247		(0)	0.00	1	32	1.50
			L	247		(0)	0.00	2	33	1.50
			K	247		(0)	0.00	1	34	1.50
			J	247		(0)	0.00	2	35	1.50
			H	247		(0)	0.00	1	36	1.50
			G	247		(0)	0.00	2	37	1.50
			F	247		(0)	0.00	1	38	1.50
			E	247		(0)	0.00	2	39	1.50
						SREM	0.00			37.50
ADR03/			AC*	73		(0)	0.00			
			Z*	73		(0)	0.00	1	40	3.00
			AA	246		(0)	0.00	2	41	5.50
			AB	246		(0)	0.00	1	42	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-8
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			X	246		(0)	0.00	2	43	3.50
			W	246		(0)	0.00	1	44	1.50
			V	246		(0)	0.00	2	45	1.50
			U	246		(0)	0.00	1	46	1.50
			T	246		(0)	0.00	2	47	1.50
			S	246		(0)	0.00	1	48	1.50
			R	246		(0)	0.00	2	49	1.50
			P	246		(0)	0.00	1	50	1.50
			N	246		(0)	0.00	2	51	1.50
			M	246		(0)	0.00	1	52	1.50
			L	246		(0)	0.00	2	53	1.50
			K	246		(0)	0.00	1	54	1.50
			J	246		(0)	0.00	2	55	1.50
			H	246		(0)	0.00	1	56	1.50
			G	246		(0)	0.00	2	57	1.50
			F	246		(0)	0.00	1	58	1.50
			E	246		(0)	0.00	2	59	1.50
						SREM	0.00			37.50
ADR04/			AC*	72		(0)	0.00			
			Z*	72		(0)	0.00	1	60	3.00
			AA	245		(0)	0.00	2	61	5.50
			AB	245		(0)	0.00	1	62	1.50
			X	245		(0)	0.00	2	63	3.50
			W	245		(0)	0.00	1	64	1.50
			V	245		(0)	0.00	2	65	1.50
			U	245		(0)	0.00	1	66	1.50
			T	245		(0)	0.00	2	67	1.50
			S	245		(0)	0.00	1	68	1.50
			R	245		(0)	0.00	2	69	1.50
			P	245		(0)	0.00	1	70	1.50
			N	245		(0)	0.00	2	71	1.50
			M	245		(0)	0.00	1	72	1.50
			L	245		(0)	0.00	2	73	1.50
			K	245		(0)	0.00	1	74	1.50
			J	245		(0)	0.00	2	75	1.50
			H	245		(0)	0.00	1	76	1.50
			G	245		(0)	0.00	2	77	1.50
			F	245		(0)	0.00	1	78	1.50
			E	245		(0)	0.00	2	79	1.50
						SREM	0.00			37.50
ADR05/			AC*	25		(0)	0.00			
			AB	212		(0)	0.00	1	80	2.50
			AA	212		(0)	0.00	2	81	1.50
			Z*	25		(0)	0.00	1	82	3.00
			X	212		(0)	0.00	2	83	3.00
			W	212		(0)	0.00	1	84	1.50
			V	212		(0)	0.00	2	85	1.50
			U	212		(0)	0.00	1	86	1.50
			T	212		(0)	0.00	2	87	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-8
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			S	212		(0)	0.00	1	88	1.50
			R	212		(0)	0.00	2	89	1.50
			P	212		(0)	0.00	1	90	1.50
			N	212		(0)	0.00	2	91	1.50
			M	212		(0)	0.00	1	92	1.50
			L	212		(0)	0.00	2	93	1.50
			K	212		(0)	0.00	1	94	1.50
			J	212		(0)	0.00	2	95	1.50
			H	212		(0)	0.00	1	96	1.50
			G	212		(0)	0.00	2	97	1.50
			F	212		(0)	0.00	1	98	1.50
			E	212		(0)	0.00	2	99	1.50
						SREM	0.00			34.00
ADR06/			AC*	30		(0)	0.00			
			AB	217		(0)	0.00	1	100	2.50
			AA	217		(0)	0.00	2	101	1.50
			Z*	30		(0)	0.00	1	102	3.00
			X	217		(0)	0.00	2	103	3.00
			W	217		(0)	0.00	1	104	1.50
			V	217		(0)	0.00	2	105	1.50
			U	217		(0)	0.00	1	106	1.50
			T	217		(0)	0.00	2	107	1.50
			S	217		(0)	0.00	1	108	1.50
			R	217		(0)	0.00	2	109	1.50
			P	217		(0)	0.00	1	110	1.50
			N	217		(0)	0.00	2	111	1.50
			M	217		(0)	0.00	1	112	1.50
			L	217		(0)	0.00	2	113	1.50
			K	217		(0)	0.00	1	114	1.50
			J	217		(0)	0.00	2	115	1.50
			H	217		(0)	0.00	1	116	1.50
			G	217		(0)	0.00	2	117	1.50
			F	217		(0)	0.00	1	118	1.50
			E	217		(0)	0.00	2	119	1.50
						SREM	0.00			34.00
ADR07/			AC*	35		(0)	0.00			
			AB	222		(0)	0.00	1	120	2.50
			AA	222		(0)	0.00	2	121	1.50
			Z*	35		(0)	0.00	1	122	3.00
			X	222		(0)	0.00	2	123	3.00
			W	222		(0)	0.00	1	124	1.50
			V	222		(0)	0.00	2	125	1.50
			U	222		(0)	0.00	1	126	1.50
			T	222		(0)	0.00	2	127	1.50
			S	222		(0)	0.00	1	128	1.50
			R	222		(0)	0.00	2	129	1.50
			P	222		(0)	0.00	1	130	1.50
			N	222		(0)	0.00	2	131	1.50
			M	222		(0)	0.00	1	132	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			L	222		(0)	0.00	2	133	1.50
			K	222		(0)	0.00	1	134	1.50
			J	222		(0)	0.00	2	135	1.50
			H	222		(0)	0.00	1	136	1.50
			G	222		(0)	0.00	2	137	1.50
			F	222		(0)	0.00	1	138	1.50
			E	222		(0)	0.00	2	139	1.50
						$REM	0.00			34.00
ADR08/			AC*	81		(0)	0.00			
			AB	281		(0)	0.00	1	140	1.50
			AA	281		(0)	0.00	2	141	1.50
			Z*	81		(0)	0.00	1	142	1.75
			X	281		(0)	0.00	2	143	2.00
			W	281		(0)	0.00	1	144	1.50
			V	281		(0)	0.00	2	145	1.50
			U	281		(0)	0.00	1	146	1.50
			T	281		(0)	0.00	2	147	1.50
			S	281		(0)	0.00	1	148	1.50
			R	281		(0)	0.00	2	149	1.50
			P	281		(0)	0.00	1	150	1.50
			N	281		(0)	0.00	2	151	1.50
			M	281		(0)	0.00	1	152	1.50
			L	281		(0)	0.00	2	153	1.50
			K	281		(0)	0.00	1	154	1.50
			J	281		(0)	0.00	2	155	1.50
			H	281		(0)	0.00	1	156	1.50
			G	281		(0)	0.00	2	157	1.50
			F	281		(0)	0.00	1	158	1.50
						$REM	0.00			29.25
ADR09/			AC*	82		(0)	0.00			
			AB	282		(0)	0.00	1	159	1.50
			AA	282		(0)	0.00	2	160	1.50
			Z*	82		(0)	0.00	1	161	1.75
			X	282		(0)	0.00	2	162	2.00
			W	282		(0)	0.00	1	163	1.50
			V	282		(0)	0.00	2	164	1.50
			U	282		(0)	0.00	1	165	1.50
			T	282		(0)	0.00	2	166	1.50
			S	282		(0)	0.00	1	167	1.50
			R	282		(0)	0.00	2	168	1.50
			P	282		(0)	0.00	1	169	1.50
			N	282		(0)	0.00	2	170	1.50
			M	282		(0)	0.00	1	171	1.50
			L	282		(0)	0.00	2	172	1.50
			K	282		(0)	0.00	1	173	1.50
			J	282		(0)	0.00	2	174	1.50
			H	282		(0)	0.00	1	175	1.50
			G	282		(0)	0.00	2	176	1.50
			F	282		(0)	0.00	1	177	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
						$REM	0.00			29.25
ADR10/			AC*	83		(0)	0.00			
			AB	283		(0)	0.00	1	178	1.50
			AA	283		(0)	0.00	2	179	1.50
			Z*	83		(0)	0.00	1	180	1.75
			X	283		(0)	0.00	2	181	2.00
			W	283		(0)	0.00	1	182	1.50
			V	283		(0)	0.00	2	183	1.50
			U	283		(0)	0.00	1	184	1.50
			T	283		(0)	0.00	2	185	1.50
			S	283		(0)	0.00	1	186	1.50
			R	283		(0)	0.00	2	187	1.50
			P	283		(0)	0.00	1	188	1.50
			N	283		(0)	0.00	2	189	1.50
			M	283		(0)	0.00	1	190	1.50
			L	283		(0)	0.00	2	191	1.50
			K	283		(0)	0.00	1	192	1.50
			J	283		(0)	0.00	2	193	1.50
			H	283		(0)	0.00	1	194	1.50
			G	283		(0)	0.00	2	195	1.50
			F	283		(0)	0.00	1	196	1.50
						$REM	0.00			29.25
ADR11/			AC*	84		(0)	0.00			
			AB	284		(0)	0.00	1	197	1.50
			AA	284		(0)	0.00	2	198	1.50
			Z*	84		(0)	0.00	1	199	1.75
			X	284		(0)	0.00	2	200	2.00
			W	284		(0)	0.00	1	201	1.50
			V	284		(0)	0.00	2	202	1.50
			U	284		(0)	0.00	1	203	1.50
			T	284		(0)	0.00	2	204	1.50
			S	284		(0)	0.00	1	205	1.50
			R	284		(0)	0.00	2	206	1.50
			P	284		(0)	0.00	1	207	1.50
			N	284		(0)	0.00	2	208	1.50
			M	284		(0)	0.00	1	209	1.50
			L	284		(0)	0.00	2	210	1.50
			K	284		(0)	0.00	1	211	1.50
			J	284		(0)	0.00	2	212	1.50
			H	284		(0)	0.00	1	213	1.50
			G	284		(0)	0.00	2	214	1.50
			F	284		(0)	0.00	1	215	1.50
						$REM	0.00			29.25
ADR12/			AC*	85		(0)	0.00			
			Z*	85		(0)	0.00	1	216	3.00
			X	285		(0)	0.00	2	217	2.00
			W	285		(0)	0.00	1	218	1.50
			V	285		(0)	0.00	2	219	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — DATE 07/10/78
*** SIRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			U	285		(0)	0.00	1	220	1.50
			T	285		(0)	0.00	2	221	1.50
			S	285		(0)	0.00	1	222	1.50
			R	285		(0)	0.00	2	223	1.50
			P	285		(0)	0.00	1	224	1.50
			N	285		(0)	0.00	2	225	1.50
			M	285		(0)	0.00	1	226	1.50
			L	285		(0)	0.00	2	227	1.50
			K	285		(0)	0.00	1	228	1.50
			J	285		(0)	0.00	2	229	1.50
			H	285		(0)	0.00	1	230	1.50
			G	285		(0)	0.00	2	231	1.50
			F	285		(0)	0.00	1	232	1.50
						$REM	0.00			27.50
ADR13/			AC*	86		(0)	0.00			
			Z*	86		(0)	0.00	1	233	3.00
			X	286		(0)	0.00	2	234	2.00
			W	286		(0)	0.00	1	235	1.50
			V	286		(0)	0.00	2	236	1.50
			U	286		(0)	0.00	1	237	1.50
			T	286		(0)	0.00	2	238	1.50
			S	286		(0)	0.00	1	239	1.50
			R	286		(0)	0.00	2	240	1.50
			P	286		(0)	0.00	1	241	1.50
			N	286		(0)	0.00	2	242	1.50
			M	286		(0)	0.00	1	243	1.50
			L	286		(0)	0.00	2	244	1.50
			K	286		(0)	0.00	1	245	1.50
			J	286		(0)	0.00	2	246	1.50
			H	286		(0)	0.00	1	247	1.50
			G	286		(0)	0.00	2	248	1.50
			F	286		(0)	0.00	1	249	1.50
						$REM	0.00			27.50
ADR14/			AC*	87		(0)	0.00			
			Z*	87		(0)	0.00	1	250	3.00
			X	287		(0)	0.00	2	251	2.00
			W	287		(0)	0.00	1	252	1.50
			V	287		(0)	0.00	2	253	1.50
			U	287		(0)	0.00	1	254	1.50
			T	287		(0)	0.00	2	255	1.50
			S	287		(0)	0.00	1	256	1.50
			R	287		(0)	0.00	2	257	1.50
			P	287		(0)	0.00	1	258	1.50
			N	287		(0)	0.00	2	259	1.50
			M	287		(0)	0.00	1	260	1.50
			L	287		(0)	0.00	2	261	1.50
			K	287		(0)	0.00	1	262	1.50
			J	287		(0)	0.00	2	263	1.50
			H	287		(0)	0.00	1	264	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — DATE 07/10/78
*** SIRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			G	287		(0)	0.00	2	265	1.50
			F	287		(0)	0.00	1	266	1.50
						$REM	0.00			27.50
ADR15/			AC*	88		(0)	0.00			
			Z*	88		(0)	0.00	1	267	3.00
			X	288		(0)	0.00	2	268	2.00
			W	288		(0)	0.00	1	269	1.50
			V	288		(0)	0.00	2	270	1.50
			U	288		(0)	0.00	1	271	1.50
			T	288		(0)	0.00	2	272	1.50
			S	288		(0)	0.00	1	273	1.50
			R	288		(0)	0.00	2	274	1.50
			P	288		(0)	0.00	1	275	1.50
			N	288		(0)	0.00	2	276	1.50
			M	288		(0)	0.00	1	277	1.50
			L	288		(0)	0.00	2	278	1.50
			K	288		(0)	0.00	1	279	1.50
			J	288		(0)	0.00	2	280	1.50
			H	288		(0)	0.00	1	281	1.50
			G	288		(0)	0.00	2	282	1.50
			F	288		(0)	0.00	1	283	1.50
						$REM	0.00			27.50
ADR16/			AC*	89		(0)	0.00			
			Z*	89		(0)	0.00	1	284	3.00
			X	289		(0)	0.00	2	285	2.00
			W	289		(0)	0.00	1	286	1.50
			V	289		(0)	0.00	2	287	1.50
			U	289		(0)	0.00	1	288	1.50
			T	289		(0)	0.00	2	289	1.50
			S	289		(0)	0.00	1	290	1.50
			R	289		(0)	0.00	2	291	1.50
			P	289		(0)	0.00	1	292	1.50
			N	289		(0)	0.00	2	293	1.50
			M	289		(0)	0.00	1	294	1.50
			L	289		(0)	0.00	2	295	1.50
			K	289		(0)	0.00	1	296	1.50
			J	289		(0)	0.00	2	297	1.50
			H	289		(0)	0.00	1	298	1.50
			G	289		(0)	0.00	2	299	1.50
			F	289		(0)	0.00	1	300	1.50
						$REM	0.00			27.50
AG-GND			AC*	99		(0)	0.00			
			AC*	101		(0)	0.00	1	301	1.25
			Z*	101		(0)	0.00	2	302	3.00
			Z*	99		(0)	0.00	1	303	1.25
						$REM	0.00			5.50
CHARINPU	T/		AC	254		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-8
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	T/		Z	254		(0)	0.00	1	304	3.00
	T/		X*	47		(0)	0.00	2	305	3.50
	T/		V*	47		(0)	0.00	1	306	2.50
	T/		T*	47		(0)	0.00	2	307	2.50
	T/		R*	47		(0)	0.00	1	308	2.50
	T/		N*	47		(0)	0.00	2	309	2.50
	T/		L*	47		(0)	0.00	1	310	2.50
	T/		J*	47		(0)	0.00	2	311	2.50
	T/		G*	47		(0)	0.00	1	312	2.50
	T/		E*	47		(0)	0.00	2	313	2.50
						SREM	0.00			26.50
DFM01			AB*	64		(0)	0.00			
			AA*	64		(0)	0.00	1	314	1.50
			W	264		(0)	0.00	2	315	3.50
			U	264		(0)	0.00	1	316	2.50
			S	264		(0)	0.00	2	317	2.50
			P	264		(0)	0.00	1	318	2.50
			M	264		(0)	0.00	2	319	2.50
			K	264		(0)	0.00	1	320	2.50
			H	264		(0)	0.00	2	321	2.50
			F	264		(0)	0.00	1	322	2.50
						SREM	0.00			22.50
DFM02			AB*	65		(0)	0.00			
			AA*	65		(0)	0.00	1	323	1.50
			W	265		(0)	0.00	2	324	3.50
			U	265		(0)	0.00	1	325	2.50
			S	265		(0)	0.00	2	326	2.50
			P	265		(0)	0.00	1	327	2.50
			M	265		(0)	0.00	2	328	2.50
			K	265		(0)	0.00	1	329	2.50
			H	265		(0)	0.00	2	330	2.50
			F	265		(0)	0.00	1	331	2.50
						SREM	0.00			22.50
DFM03			AB*	66		(0)	0.00			
			AA*	66		(0)	0.00	1	332	1.50
			W	266		(0)	0.00	2	333	3.50
			U	266		(0)	0.00	1	334	2.50
			S	266		(0)	0.00	2	335	2.50
			P	266		(0)	0.00	1	336	2.50
			M	266		(0)	0.00	2	337	2.50
			K	266		(0)	0.00	1	338	2.50
			H	266		(0)	0.00	2	339	2.50
			F	266		(0)	0.00	1	340	2.50
						SREM	0.00			22.50
DFM04			AB*	67		(0)	0.00			
			AA*	67		(0)	0.00	1	341	1.50
			W	267		(0)	0.00	2	342	3.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-8
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			U	267		(0)	0.00	1	343	2.50
			S	267		(0)	0.00	2	344	2.50
			P	267		(0)	0.00	1	345	2.50
			M	267		(0)	0.00	2	346	2.50
			K	267		(0)	0.00	1	347	2.50
			H	267		(0)	0.00	2	348	2.50
			F	267		(0)	0.00	1	349	2.50
						SREM	0.00			22.50
DFM05			AB*	68		(0)	0.00			
			AA*	68		(0)	0.00	1	350	1.50
			W	268		(0)	0.00	2	351	3.50
			U	268		(0)	0.00	1	352	2.50
			S	268		(0)	0.00	2	353	2.50
			P	268		(0)	0.00	1	354	2.50
			M	268		(0)	0.00	2	355	2.50
			K	268		(0)	0.00	1	356	2.50
			H	268		(0)	0.00	2	357	2.50
			F	268		(0)	0.00	1	358	2.50
						SREM	0.00			22.50
DFM06			AB*	69		(0)	0.00			
			AA*	69		(0)	0.00	1	359	1.50
			W	269		(0)	0.00	2	360	3.50
			U	269		(0)	0.00	1	361	2.50
			S	269		(0)	0.00	2	362	2.50
			P	269		(0)	0.00	1	363	2.50
			M	269		(0)	0.00	2	364	2.50
			K	269		(0)	0.00	1	365	2.50
			H	269		(0)	0.00	2	366	2.50
			F	269		(0)	0.00	1	367	2.50
						SREM	0.00			22.50
DFM07			AB*	70		(0)	0.00			
			AA*	70		(0)	0.00	1	368	1.50
			W	270		(0)	0.00	2	369	3.50
			U	270		(0)	0.00	1	370	2.50
			S	270		(0)	0.00	2	371	2.50
			P	270		(0)	0.00	1	372	2.50
			M	270		(0)	0.00	2	373	2.50
			K	270		(0)	0.00	1	374	2.50
			H	270		(0)	0.00	2	375	2.50
			F	270		(0)	0.00	1	376	2.50
						SREM	0.00			22.50
DFM08			AB*	71		(0)	0.00			
			AA*	71		(0)	0.00	1	377	1.50
			W	271		(0)	0.00	2	378	3.50
			U	271		(0)	0.00	1	379	2.50
			S	271		(0)	0.00	2	380	2.50
			P	271		(0)	0.00	1	381	2.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			M	271		(0)	0.00	2	382	2.50
			K	271		(0)	0.00	1	383	2.50
			H	271		(0)	0.00	2	384	2.50
			F	271		(0)	0.00	1	385	2.50
						$REM	0.00			22.50
DFM09			AB*	72		(0)	0.00			
			AA*	72		(0)	0.00	1	386	1.50
			W	272		(0)	0.00	2	387	3.50
			U	272		(0)	0.00	1	388	2.50
			S	272		(0)	0.00	2	389	2.50
			P	272		(0)	0.00	1	390	2.50
			M	272		(0)	0.00	2	391	2.50
			K	272		(0)	0.00	1	392	2.50
			H	272		(0)	0.00	2	393	2.50
			F	272		(0)	0.00	1	394	2.50
						$REM	0.00			22.50
DFM10			AB*	73		(0)	0.00			
			AA*	73		(0)	0.00	1	395	1.50
			W	273		(0)	0.00	2	396	3.50
			U	273		(0)	0.00	1	397	2.50
			S	273		(0)	0.00	2	398	2.50
			P	273		(0)	0.00	1	399	2.50
			M	273		(0)	0.00	2	400	2.50
			K	273		(0)	0.00	1	401	2.50
			H	273		(0)	0.00	2	402	2.50
			F	273		(0)	0.00	1	403	2.50
						$REM	0.00			22.50
DFM11			AB*	74		(0)	0.00			
			AA*	74		(0)	0.00	1	404	1.50
			W	274		(0)	0.00	2	405	3.50
			U	274		(0)	0.00	1	406	2.50
			S	274		(0)	0.00	2	407	2.50
			P	274		(0)	0.00	1	408	2.50
			M	274		(0)	0.00	2	409	2.50
			K	274		(0)	0.00	1	410	2.50
			H	274		(0)	0.00	2	411	2.50
			F	274		(0)	0.00	1	412	2.50
						$REM	0.00			22.50
DFM12			AB*	75		(0)	0.00			
			AA*	75		(0)	0.00	1	413	1.50
			W	275		(0)	0.00	2	414	3.50
			U	275		(0)	0.00	1	415	2.50
			S	275		(0)	0.00	2	416	2.50
			P	275		(0)	0.00	1	417	2.50
			M	275		(0)	0.00	2	418	2.50
			K	275		(0)	0.00	1	419	2.50
			H	275		(0)	0.00	2	420	2.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			F	275		(0)	0.00	1	421	2.50
						$REM	0.00			22.50
DFM13			AB*	76		(0)	0.00			
			AA*	76		(0)	0.00	1	422	1.50
			W	276		(0)	0.00	2	423	3.50
			U	276		(0)	0.00	1	424	2.50
			S	276		(0)	0.00	2	425	2.50
			P	276		(0)	0.00	1	426	2.50
			M	276		(0)	0.00	2	427	2.50
			K	276		(0)	0.00	1	428	2.50
			H	276		(0)	0.00	2	429	2.50
			F	276		(0)	0.00	1	430	2.50
						$REM	0.00			22.50
DFM14			AB*	77		(0)	0.00			
			AA*	77		(0)	0.00	1	431	1.50
			W	277		(0)	0.00	2	432	3.50
			U	277		(0)	0.00	1	433	2.50
			S	277		(0)	0.00	2	434	2.50
			P	277		(0)	0.00	1	435	2.50
			M	277		(0)	0.00	2	436	2.50
			K	277		(0)	0.00	1	437	2.50
			H	277		(0)	0.00	2	438	2.50
			F	277		(0)	0.00	1	439	2.50
						$REM	0.00			22.50
DFM15			AB*	78		(0)	0.00			
			AA*	78		(0)	0.00	1	440	1.50
			W	278		(0)	0.00	2	441	3.50
			U	278		(0)	0.00	1	442	2.50
			S	278		(0)	0.00	2	443	2.50
			P	278		(0)	0.00	1	444	2.50
			M	278		(0)	0.00	2	445	2.50
			K	278		(0)	0.00	1	446	2.50
			H	278		(0)	0.00	2	447	2.50
			F	278		(0)	0.00	1	448	2.50
						$REM	0.00			22.50
DFM16			AB*	79		(0)	0.00			
			AA*	79		(0)	0.00	1	449	1.50
			W	279		(0)	0.00	2	450	3.50
			U	279		(0)	0.00	1	451	2.50
			S	279		(0)	0.00	2	452	2.50
			P	279		(0)	0.00	1	453	2.50
			M	279		(0)	0.00	2	454	2.50
			K	279		(0)	0.00	1	455	2.50
			H	279		(0)	0.00	2	456	2.50
			F	279		(0)	0.00	1	457	2.50
						$REM	0.00			22.50
DMA-DTM0	1/		AB	264		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B
COC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	1/		AA	264		(0)	0.00	1	458	1.50
	1/		W*	64		(0)	0.00	2	459	3.50
	1/		U*	64		(0)	0.00	1	460	2.50
	1/		S*	64		(0)	0.00	2	461	2.50
	1/		P*	64		(0)	0.00	1	462	2.50
	1/		M*	64		(0)	0.00	2	463	2.50
	1/		K*	64		(0)	0.00	1	464	2.50
	1/		H*	64		(0)	0.00	2	465	2.50
	1/		F*	64		(0)	0.00	1	466	2.50
						$REM	0.00			22.50
DMA-DTM0	2/		AB	265		(0)	0.00			
	2/		AA	265		(0)	0.00	1	467	1.50
	2/		W*	65		(0)	0.00	2	468	3.50
	2/		U*	65		(0)	0.00	1	469	2.50
	2/		S*	65		(0)	0.00	2	470	2.50
	2/		P*	65		(0)	0.00	1	471	2.50
	2/		M*	65		(0)	0.00	2	472	2.50
	2/		K*	65		(0)	0.00	1	473	2.50
	2/		H*	65		(0)	0.00	2	474	2.50
	2/		F*	65		(0)	0.00	1	475	2.50
						$REM	0.00			22.50
DMA-DTM0	3/		AB	266		(0)	0.00			
	3/		AA	266		(0)	0.00	1	476	1.50
	3/		W*	66		(0)	0.00	2	477	3.50
	3/		U*	66		(0)	0.00	1	478	2.50
	3/		S*	66		(0)	0.00	2	479	2.50
	3/		P*	66		(0)	0.00	1	480	2.50
	3/		M*	66		(0)	0.00	2	481	2.50
	3/		K*	66		(0)	0.00	1	482	2.50
	3/		H*	66		(0)	0.00	2	483	2.50
	3/		F*	66		(0)	0.00	1	484	2.50
						$REM	0.00			22.50
DMA-DTM0	4/		AB	267		(0)	0.00			
	4/		AA	267		(0)	0.00	1	485	1.50
	4/		W*	67		(0)	0.00	2	486	3.50
	4/		U*	67		(0)	0.00	1	487	2.50
	4/		S*	67		(0)	0.00	2	488	2.50
	4/		P*	67		(0)	0.00	1	489	2.50
	4/		M*	67		(0)	0.00	2	490	2.50
	4/		K*	67		(0)	0.00	1	491	2.50
	4/		H*	67		(0)	0.00	2	492	2.50
	4/		F*	67		(0)	0.00	1	493	2.50
						$REM	0.00			22.50
DMA-DTM0	5/		AB	268		(0)	0.00			
	5/		AA	268		(0)	0.00	1	494	1.50
	5/		W*	68		(0)	0.00	2	495	3.50
	5/		U*	68		(0)	0.00	1	496	2.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B
COC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	5/		S*	68		(0)	0.00	2	497	2.50
	5/		P*	68		(0)	0.00	1	498	2.50
	5/		M*	68		(0)	0.00	2	499	2.50
	5/		K*	68		(0)	0.00	1	500	2.50
	5/		H*	68		(0)	0.00	2	501	2.50
	5/		F*	68		(0)	0.00	1	502	2.50
						$REM	0.00			22.50
DMA-DTM0	6/		AB	269		(0)	0.00			
	6/		AA	269		(0)	0.00	1	503	1.50
	6/		W*	69		(0)	0.00	2	504	3.50
	6/		U*	69		(0)	0.00	1	505	2.50
	6/		S*	69		(0)	0.00	2	506	2.50
	6/		P*	69		(0)	0.00	1	507	2.50
	6/		M*	69		(0)	0.00	2	508	2.50
	6/		K*	69		(0)	0.00	1	509	2.50
	6/		H*	69		(0)	0.00	2	510	2.50
	6/		F*	69		(0)	0.00	1	511	2.50
						$REM	0.00			22.50
DMA-DTM0	7/		AB	270		(0)	0.00			
	7/		AA	270		(0)	0.00	1	512	1.50
	7/		W*	70		(0)	0.00	2	513	3.50
	7/		U*	70		(0)	0.00	1	514	2.50
	7/		S*	70		(0)	0.00	2	515	2.50
	7/		P*	70		(0)	0.00	1	516	2.50
	7/		M*	70		(0)	0.00	2	517	2.50
	7/		K*	70		(0)	0.00	1	518	2.50
	7/		H*	70		(0)	0.00	2	519	2.50
	7/		F*	70		(0)	0.00	1	520	2.50
						$REM	0.00			22.50
DMA-DTM0	8/		AB	271		(0)	0.00			
	8/		AA	271		(0)	0.00	1	521	1.50
	8/		W*	71		(0)	0.00	2	522	3.50
	8/		U*	71		(0)	0.00	1	523	2.50
	8/		S*	71		(0)	0.00	2	524	2.50
	8/		P*	71		(0)	0.00	1	525	2.50
	8/		M*	71		(0)	0.00	2	526	2.50
	8/		K*	71		(0)	0.00	1	527	2.50
	8/		H*	71		(0)	0.00	2	528	2.50
	8/		F*	71		(0)	0.00	1	529	2.50
						$REM	0.00			22.50
DMA-DTM0	9/		AB	272		(0)	0.00			
	9/		AA	272		(0)	0.00	1	530	1.50
	9/		W*	72		(0)	0.00	2	531	3.50
	9/		U*	72		(0)	0.00	1	532	2.50
	9/		S*	72		(0)	0.00	2	533	2.50
	9/		P*	72		(0)	0.00	1	534	2.50
	9/		M*	72		(0)	0.00	2	535	2.50

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SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	9/		K*	72		(0)	0.00	1	536	2.50
	9/		H*	72		(0)	0.00	2	537	2.50
	9/		F*	72		(0)	0.00	1	538	2.50
						SREM	0.00			22.50
DMA-DTM1	0/		AB	273		(0)	0.00			
	0/		AA	273		(0)	0.00	1	539	1.50
	0/		W*	73		(0)	0.00	2	540	3.50
	0/		U*	73		(0)	0.00	1	541	2.50
	0/		S*	73		(0)	0.00	2	542	2.50
	0/		P*	73		(0)	0.00	1	543	2.50
	0/		M*	73		(0)	0.00	2	544	2.50
	0/		K*	73		(0)	0.00	1	545	2.50
	0/		H*	73		(0)	0.00	2	546	2.50
	0/		F*	73		(0)	0.00	1	547	2.50
						SREM	0.00			22.50
DMA-DTM1	1/		AB	274		(0)	0.00			
	1/		AA	274		(0)	0.00	1	548	1.50
	1/		W*	74		(0)	0.00	2	549	3.50
	1/		U*	74		(0)	0.00	1	550	2.50
	1/		S*	74		(0)	0.00	2	551	2.50
	1/		P*	74		(0)	0.00	1	552	2.50
	1/		M*	74		(0)	0.00	2	553	2.50
	1/		K*	74		(0)	0.00	1	554	2.50
	1/		H*	74		(0)	0.00	2	555	2.50
	1/		F*	74		(0)	0.00	1	556	2.50
						SREM	0.00			22.50
DMA-DTM1	2/		AB	275		(0)	0.00			
	2/		AA	275		(0)	0.00	1	557	1.50
	2/		W*	75		(0)	0.00	2	558	3.50
	2/		U*	75		(0)	0.00	1	559	2.50
	2/		S*	75		(0)	0.00	2	560	2.50
	2/		P*	75		(0)	0.00	1	561	2.50
	2/		M*	75		(0)	0.00	2	562	2.50
	2/		K*	75		(0)	0.00	1	563	2.50
	2/		H*	75		(0)	0.00	2	564	2.50
	2/		F*	75		(0)	0.00	1	565	2.50
						SREM	0.00			22.50
DMA-DTM1	3/		AB	276		(0)	0.00			
	3/		AA	276		(0)	0.00	1	566	1.50
	3/		W*	76		(0)	0.00	2	567	3.50
	3/		U*	76		(0)	0.00	1	568	2.50
	3/		S*	76		(0)	0.00	2	569	2.50
	3/		P*	76		(0)	0.00	1	570	2.50
	3/		M*	76		(0)	0.00	2	571	2.50
	3/		K*	76		(0)	0.00	1	572	2.50
	3/		H*	76		(0)	0.00	2	573	2.50
	3/		F*	76		(0)	0.00	1	574	2.50

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SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
						SREM	0.00			22.50
DMA-DTM1	4/		AB	277		(0)	0.00			
	4/		AA	277		(0)	0.00	1	575	1.50
	4/		W*	77		(0)	0.00	2	576	3.50
	4/		U*	77		(0)	0.00	1	577	2.50
	4/		S*	77		(0)	0.00	2	578	2.50
	4/		P*	77		(0)	0.00	1	579	2.50
	4/		M*	77		(0)	0.00	2	580	2.50
	4/		K*	77		(0)	0.00	1	581	2.50
	4/		H*	77		(0)	0.00	2	582	2.50
	4/		F*	77		(0)	0.00	1	583	2.50
						SREM	0.00			22.50
DMA-DTM1	5/		AB	278		(0)	0.00			
	5/		AA	278		(0)	0.00	1	584	1.50
	5/		W*	78		(0)	0.00	2	585	3.50
	5/		U*	78		(0)	0.00	1	586	2.50
	5/		S*	78		(0)	0.00	2	587	2.50
	5/		P*	78		(0)	0.00	1	588	2.50
	5/		M*	78		(0)	0.00	2	589	2.50
	5/		K*	78		(0)	0.00	1	590	2.50
	5/		H*	78		(0)	0.00	2	591	2.50
	5/		F*	78		(0)	0.00	1	592	2.50
						SREM	0.00			22.50
DMA-DTM1	6/		AB	279		(0)	0.00			
	6/		AA	279		(0)	0.00	1	593	1.50
	6/		W*	79		(0)	0.00	2	594	3.50
	6/		U*	79		(0)	0.00	1	595	2.50
	6/		S*	79		(0)	0.00	2	596	2.50
	6/		P*	79		(0)	0.00	1	597	2.50
	6/		M*	79		(0)	0.00	2	598	2.50
	6/		K*	79		(0)	0.00	1	599	2.50
	6/		H*	79		(0)	0.00	2	600	2.50
	6/		F*	79		(0)	0.00	1	601	2.50
						SREM	0.00			22.50
DMA-MAB0	1/		AB*	53		(0)	0.00			
	1/		AA*	53		(0)	0.00	1	602	1.50
	1/		W*	53		(0)	0.00	2	603	3.50
	1/		U*	53		(0)	0.00	1	604	2.50
	1/		S*	53		(0)	0.00	2	605	2.50
	1/		P*	53		(0)	0.00	1	606	2.50
	1/		M*	53		(0)	0.00	2	607	2.50
	1/		K*	53		(0)	0.00	1	608	2.50
	1/		H*	53		(0)	0.00	2	609	2.50
	1/		F*	53		(0)	0.00	1	610	2.50
						SREM	0.00			22.50
DMA-MAB0	2/		AB*	54		(0)	0.00			

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC	TYPE		S/L	L	WIRE NO.	W/L
	2/		AA*	54			(0)	0.00	1	611	1.50
	2/		W*	54			(0)	0.00	2	612	3.50
	2/		U*	54			(0)	0.00	1	613	2.50
	2/		S*	54			(0)	0.00	2	614	2.50
	2/		P*	54			(0)	0.00	1	615	2.50
	2/		M*	54			(0)	0.00	2	616	2.50
	2/		K*	54			(0)	0.00	1	617	2.50
	2/		H*	54			(0)	0.00	2	618	2.50
	2/		F*	54			(0)	0.00	1	619	2.50
							$REM	0.00			22.50
DMA-MAB0	3/		AB*	55			(0)	0.00			
	3/		AA*	55			(0)	0.00	1	620	1.50
	3/		W*	55			(0)	0.00	2	621	3.50
	3/		U*	55			(0)	0.00	1	622	2.50
	3/		S*	55			(0)	0.00	2	623	2.50
	3/		P*	55			(0)	0.00	1	624	2.50
	3/		M*	55			(0)	0.00	2	625	2.50
	3/		K*	55			(0)	0.00	1	626	2.50
	3/		H*	55			(0)	0.00	2	627	2.50
	3/		F*	55			(0)	0.00	1	628	2.50
							$REM	0.00			22.50
DMA-MAB0	4/		AB*	56			(0)	0.00			
	4/		AA*	56			(0)	0.00	1	629	1.50
	4/		W*	56			(0)	0.00	2	630	3.50
	4/		U*	56			(0)	0.00	1	631	2.50
	4/		S*	56			(0)	0.00	2	632	2.50
	4/		P*	56			(0)	0.00	1	633	2.50
	4/		M*	56			(0)	0.00	2	634	2.50
	4/		K*	56			(0)	0.00	1	635	2.50
	4/		H*	56			(0)	0.00	2	636	2.50
	4/		F*	56			(0)	0.00	1	637	2.50
							$REM	0.00			22.50
DMA-MAB0	5/		AB*	57			(0)	0.00			
	5/		AA*	57			(0)	0.00	1	638	1.50
	5/		W*	57			(0)	0.00	2	639	3.50
	5/		U*	57			(0)	0.00	1	640	2.50
	5/		S*	57			(0)	0.00	2	641	2.50
	5/		P*	57			(0)	0.00	1	642	2.50
	5/		M*	57			(0)	0.00	2	643	2.50
	5/		K*	57			(0)	0.00	1	644	2.50
	5/		H*	57			(0)	0.00	2	645	2.50
	5/		F*	57			(0)	0.00	1	646	2.50
							$REM	0.00			22.50
DMA-MAB0	6/		AB*	58			(0)	0.00			
	6/		AA*	58			(0)	0.00	1	647	1.50
	6/		W*	58			(0)	0.00	2	648	3.50
	6/		U*	58			(0)	0.00	1	649	2.50

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC	TYPE		S/L	L	WIRE NO.	W/L
	6/		S*	58			(0)	0.00	2	650	2.50
	6/		P*	58			(0)	0.00	1	651	2.50
	6/		M*	58			(0)	0.00	2	652	2.50
	6/		K*	58			(0)	0.00	1	653	2.50
	6/		H*	58			(0)	0.00	2	654	2.50
	6/		F*	58			(0)	0.00	1	655	2.50
							$REM	0.00			22.50
DMA-MAB0	7/		AB*	59			(0)	0.00			
	7/		AA*	59			(0)	0.00	1	656	1.50
	7/		W*	59			(0)	0.00	2	657	3.50
	7/		U*	59			(0)	0.00	1	658	2.50
	7/		S*	59			(0)	0.00	2	659	2.50
	7/		P*	59			(0)	0.00	1	660	2.50
	7/		M*	59			(0)	0.00	2	661	2.50
	7/		K*	59			(0)	0.00	1	662	2.50
	7/		H*	59			(0)	0.00	2	663	2.50
	7/		F*	59			(0)	0.00	1	664	2.50
							$REM	0.00			22.50
DMA-MAB0	8/		AB*	60			(0)	0.00			
	8/		AA*	60			(0)	0.00	1	665	1.50
	8/		W*	60			(0)	0.00	2	666	3.50
	8/		U*	60			(0)	0.00	1	667	2.50
	8/		S*	60			(0)	0.00	2	668	2.50
	8/		P*	60			(0)	0.00	1	669	2.50
	8/		M*	60			(0)	0.00	2	670	2.50
	8/		K*	60			(0)	0.00	1	671	2.50
	8/		H*	60			(0)	0.00	2	672	2.50
	8/		F*	60			(0)	0.00	1	673	2.50
							$REM	0.00			22.50
DMA-MAB0	9/		AB*	61			(0)	0.00			
	9/		AA*	61			(0)	0.00	1	674	1.50
	9/		W*	61			(0)	0.00	2	675	3.50
	9/		U*	61			(0)	0.00	1	676	2.50
	9/		S*	61			(0)	0.00	2	677	2.50
	9/		P*	61			(0)	0.00	1	678	2.50
	9/		M*	61			(0)	0.00	2	679	2.50
	9/		K*	61			(0)	0.00	1	680	2.50
	9/		H*	61			(0)	0.00	2	681	2.50
	9/		F*	61			(0)	0.00	1	682	2.50
							$REM	0.00			22.50
DMA-MAB1	0/		AB*	62			(0)	0.00			
	0/		AA*	62			(0)	0.00	1	683	1.50
	0/		W*	62			(0)	0.00	2	684	3.50
	0/		U*	62			(0)	0.00	1	685	2.50
	0/		S*	62			(0)	0.00	2	686	2.50
	0/		P*	62			(0)	0.00	1	687	2.50
	0/		M*	62			(0)	0.00	2	688	2.50

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SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	0/		K*	62		(0)	0.00	1	689	2.50
	0/		H*	62		(0)	0.00	2	690	2.50
	0/		F*	62		(0)	0.00	1	691	2.50
						SREM	0.00			22.50
DMA-MAB1	1/		AB	253		(0)	0.00			
	1/		AA	253		(0)	0.00	1	692	1.50
	1/		W	253		(0)	0.00	2	693	3.50
	1/		U	253		(0)	0.00	1	694	2.50
	1/		S	253		(0)	0.00	2	695	2.50
	1/		P	253		(0)	0.00	1	696	2.50
	1/		M	253		(0)	0.00	2	697	2.50
	1/		K	253		(0)	0.00	1	698	2.50
	1/		H	253		(0)	0.00	2	699	2.50
	1/		F	253		(0)	0.00	1	700	2.50
						SREM	0.00			22.50
DMA-MAB1	2/		AB	254		(0)	0.00			
	2/		AA	254		(0)	0.00	1	701	1.50
	2/		W	254		(0)	0.00	2	702	3.50
	2/		U	254		(0)	0.00	1	703	2.50
	2/		S	254		(0)	0.00	2	704	2.50
	2/		P	254		(0)	0.00	1	705	2.50
	2/		M	254		(0)	0.00	2	706	2.50
	2/		K	254		(0)	0.00	1	707	2.50
	2/		H	254		(0)	0.00	2	708	2.50
	2/		F	254		(0)	0.00	1	709	2.50
						SREM	0.00			22.50
DMA-MAB1	3/		AB	255		(0)	0.00			
	3/		AA	255		(0)	0.00	1	710	1.50
	3/		W	255		(0)	0.00	2	711	3.50
	3/		U	255		(0)	0.00	1	712	2.50
	3/		S	255		(0)	0.00	2	713	2.50
	3/		P	255		(0)	0.00	1	714	2.50
	3/		M	255		(0)	0.00	2	715	2.50
	3/		K	255		(0)	0.00	1	716	2.50
	3/		H	255		(0)	0.00	2	717	2.50
	3/		F	255		(0)	0.00	1	718	2.50
						SREM	0.00			22.50
DMA-MAB1	4/		AB	256		(0)	0.00			
	4/		AA	256		(0)	0.00	1	719	1.50
	4/		W	256		(0)	0.00	2	720	3.50
	4/		U	256		(0)	0.00	1	721	2.50
	4/		S	256		(0)	0.00	2	722	2.50
	4/		P	256		(0)	0.00	1	723	2.50
	4/		M	256		(0)	0.00	2	724	2.50
	4/		K	256		(0)	0.00	1	725	2.50
	4/		H	256		(0)	0.00	2	726	2.50
	4/		F	256		(0)	0.00	1	727	2.50

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SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
						SREM	0.00			22.50
DMA-MAB1	5/		AB	257		(0)	0.00			
	5/		AA	257		(0)	0.00	1	728	1.50
	5/		W	257		(0)	0.00	2	729	3.50
	5/		U	257		(0)	0.00	1	730	2.50
	5/		S	257		(0)	0.00	2	731	2.50
	5/		P	257		(0)	0.00	1	732	2.50
	5/		M	257		(0)	0.00	2	733	2.50
	5/		K	257		(0)	0.00	1	734	2.50
	5/		H	257		(0)	0.00	2	735	2.50
	5/		F	257		(0)	0.00	1	736	2.50
						SREM	0.00			22.50
DMA-MAB1	6/		AB	258		(0)	0.00			
	6/		AA	258		(0)	0.00	1	737	1.50
	6/		W	258		(0)	0.00	2	738	3.50
	6/		U	258		(0)	0.00	1	739	2.50
	6/		S	258		(0)	0.00	2	740	2.50
	6/		P	258		(0)	0.00	1	741	2.50
	6/		M	258		(0)	0.00	2	742	2.50
	6/		K	258		(0)	0.00	1	743	2.50
	6/		H	258		(0)	0.00	2	744	2.50
	6/		F	258		(0)	0.00	1	745	2.50
						SREM	0.00			22.50
DMA-MAB1	7/		AB*	35		(0)	0.00			
	7/		AA*	35		(0)	0.00	1	746	1.50
	7/		W*	35		(0)	0.00	2	747	3.50
	7/		U*	35		(0)	0.00	1	748	2.50
	7/		S*	35		(0)	0.00	2	749	2.50
	7/		P*	35		(0)	0.00	1	750	2.50
	7/		M*	35		(0)	0.00	2	751	2.50
	7/		K*	35		(0)	0.00	1	752	2.50
	7/		H*	35		(0)	0.00	2	753	2.50
	7/		F*	35		(0)	0.00	1	754	2.50
						SREM	0.00			22.50
DMA-MAB1	9/		AB*	47		(0)	0.00			
	9/		AA*	47		(0)	0.00	1	755	1.50
	9/		W*	47		(0)	0.00	2	756	3.50
	9/		U*	47		(0)	0.00	1	757	2.50
	9/		S*	47		(0)	0.00	2	758	2.50
	9/		P*	47		(0)	0.00	1	759	2.50
	9/		M*	47		(0)	0.00	2	760	2.50
	9/		K*	47		(0)	0.00	1	761	2.50
	9/		H*	47		(0)	0.00	2	762	2.50
	9/		F*	47		(0)	0.00	1	763	2.50
						SREM	0.00			22.50
DMA-MAB/			AB	263		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			AA	263		(0)	0.00	1	764	1.50
			W	263		(0)	0.00	2	765	3.50
			U	263		(0)	0.00	1	766	2.50
			S	263		(0)	0.00	2	767	2.50
			P	263		(0)	0.00	1	768	2.50
			M	263		(0)	0.00	2	769	2.50
			K	263		(0)	0.00	1	770	2.50
			H	263		(0)	0.00	2	771	2.50
			F	263		(0)	0.00	1	772	2.50
						SREM	0.00			22.50
DMA-MDS/			AB	262		(0)	0.00			
			AA	262		(0)	0.00	1	773	1.50
			W	262		(0)	0.00	2	774	3.50
			U	262		(0)	0.00	1	775	2.50
			S	262		(0)	0.00	2	776	2.50
			P	262		(0)	0.00	1	777	2.50
			M	262		(0)	0.00	2	778	2.50
			K	262		(0)	0.00	1	779	2.50
			H	262		(0)	0.00	2	780	2.50
			F	262		(0)	0.00	1	781	2.50
						SREM	0.00			22.50
DMA-MPE/			AB	252		(0)	0.00			
			AA	252		(0)	0.00	1	782	1.50
			W	252		(0)	0.00	2	783	3.50
			U	252		(0)	0.00	1	784	2.50
			S	252		(0)	0.00	2	785	2.50
			P	252		(0)	0.00	1	786	2.50
			M	252		(0)	0.00	2	787	2.50
			K	252		(0)	0.00	1	788	2.50
			H	252		(0)	0.00	2	789	2.50
			F	252		(0)	0.00	1	790	2.50
						SREM	0.00			22.50
DMA-PROT	/		AB	232		(0)	0.00			
	/		AA	232		(0)	0.00	1	791	1.50
	/		W	232		(0)	0.00	2	792	3.50
	/		U	232		(0)	0.00	1	793	2.50
	/		S	232		(0)	0.00	2	794	2.50
	/		P	232		(0)	0.00	1	795	2.50
	/		M	232		(0)	0.00	2	796	2.50
	/		K	232		(0)	0.00	1	797	2.50
	/		H	232		(0)	0.00	2	798	2.50
	/		F	232		(0)	0.00	1	799	2.50
						SREM	0.00			22.50
DMA-WRIT	E		AB*	63		(0)	0.00			
	E		AA*	63		(0)	0.00	1	800	1.50
	E		W*	63		(0)	0.00	2	801	3.50
	E		U*	63		(0)	0.00	1	802	2.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	E		S*	63		(0)	0.00	2	803	2.50
	E		P*	63		(0)	0.00	1	804	2.50
	E		M*	63		(0)	0.00	2	805	2.50
	E		K*	63		(0)	0.00	1	806	2.50
	E		H*	63		(0)	0.00	2	807	2.50
	E		F*	63		(0)	0.00	1	808	2.50
						SREM	0.00			22.50
DMA1-INT			AB	285		(0)	0.00			
			AA	285		(0)	0.00	1	809	1.50
			F	259		(0)	0.00	2	810	13.00
						SREM	0.00			14.50
DMA1-MAB	18/		AB*	80		(0)	0.00			
	18/		AA*	80		(0)	0.00	1	811	1.50
	18/		F*	36		(0)	0.00	2	812	14.00
						SREM	0.00			15.50
DMA1-MR/			AB	225		(0)	0.00			
			AA	225		(0)	0.00	1	813	1.50
			F	260		(0)	0.00	2	814	14.00
						SREM	0.00			15.50
DMA1-RA/			AB	226		(0)	0.00			
			AA	226		(0)	0.00	1	815	1.50
			F	261		(0)	0.00	2	816	14.00
						SREM	0.00			15.50
DMA2-INT			AB	286		(0)	0.00			
			AA	286		(0)	0.00	1	817	1.50
			H	259		(0)	0.00	2	818	12.00
						SREM	0.00			13.50
DMA2-MAB	18/		AB	250		(0)	0.00			
	18/		AA	250		(0)	0.00	1	819	1.50
	18/		H*	36		(0)	0.00	2	820	12.00
						SREM	0.00			13.50
DMA2-MR/			AB	228		(0)	0.00			
			AA	228		(0)	0.00	1	821	1.50
			H	260		(0)	0.00	2	822	13.00
						SREM	0.00			14.50
DMA2-MA/			AB	229		(0)	0.00			
			AA	229		(0)	0.00	1	823	1.50
			H	261		(0)	0.00	2	824	13.00
						SREM	0.00			14.50
DMA3-INT			AB	287		(0)	0.00			
			AA	287		(0)	0.00	1	825	1.50
			K	259		(0)	0.00	2	826	11.00

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
						SREM	0.00			12.50
DMA3-MAB	18/		AB	242		(0)	0.00			
	18/		AA	242		(0)	0.00	1	827	1.50
	18/		K*	36		(0)	0.00	2	828	10.00
						SREM	0.00			11.50
DMA3-MR/			AB	230		(0)	0.00			
			AA	230		(0)	0.00	1	829	1.50
			K	260		(0)	0.00	2	830	11.00
						SREM	0.00			12.50
DMA3-RA/			AB	231		(0)	0.00			
			AA	231		(0)	0.00	1	831	1.50
			K	261		(0)	0.00	2	832	11.00
						SREM	0.00			12.50
DMA4-INT			AB	288		(0)	0.00			
			AA	288		(0)	0.00	1	833	1.50
			M	259		(0)	0.00	2	834	10.00
						SREM	0.00			11.50
DMA4-MAB	18/		AB*	38		(0)	0.00			
	18/		AA*	36		(0)	0.00	1	835	1.50
	18/		M*	36		(0)	0.00	2	836	9.00
						SREM	0.00			10.50
DMA4-MR/			AB	233		(0)	0.00			
			AA	233		(0)	0.00	1	837	1.50
			M	260		(0)	0.00	2	838	10.00
						SREM	0.00			11.50
DMA4-RA/			AB	234		(0)	0.00			
			AA	234		(0)	0.00	1	839	1.50
			M	261		(0)	0.00	2	840	10.00
						SREM	0.00			11.50
DMA5-INT			AB	289		(0)	0.00			
			AA	289		(0)	0.00	1	841	1.50
			P	259		(0)	0.00	2	842	9.00
						SREM	0.00			10.50
DMA5-MAB	18/		AB*	3		(0)	0.00			
	18/		AA*	3		(0)	0.00	1	843	1.50
	18/		P*	36		(0)	0.00	2	844	9.00
						SREM	0.00			10.50
DMA5-MR/			AB	235		(0)	0.00			
			AA	235		(0)	0.00	1	845	1.50
			P	260		(0)	0.00	2	846	9.00
						SREM	0.00			10.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
DMA5-RA/			AB	236		(0)	0.00			
			AA	236		(0)	0.00	1	847	1.50
			P	261		(0)	0.00	2	848	9.00
						SREM	0.00			10.50
DMA6-INT			AB	293		(0)	0.00			
			AA	293		(0)	0.00	1	849	1.50
			S	259		(0)	0.00	2	850	8.00
						SREM	0.00			9.50
DMA6-MAB	18/		AB	213		(0)	0.00			
	18/		AA	213		(0)	0.00	1	851	1.50
	18/		S*	36		(0)	0.00	2	852	7.00
						SREM	0.00			8.50
DMA6-MR/			AB	238		(0)	0.00			
			AA	238		(0)	0.00	1	853	1.50
			S	260		(0)	0.00	2	854	8.00
						SREM	0.00			9.50
DMA6-RA/			AB	239		(0)	0.00			
			AA	239		(0)	0.00	1	855	1.50
			S	261		(0)	0.00	2	856	8.00
						SREM	0.00			9.50
DMA7-INT			AB	294		(0)	0.00			
			AA	294		(0)	0.00	1	857	1.50
			U	259		(0)	0.00	2	858	7.00
						SREM	0.00			8.50
DMA7-MAB	18/		AB*	37		(0)	0.00			
	18/		AA*	37		(0)	0.00	1	859	1.50
	18/		U*	36		(0)	0.00	2	860	4.75
						SREM	0.00			6.25
DMA7-MR/			AB	240		(0)	0.00			
			AA	240		(0)	0.00	1	861	1.50
			U	260		(0)	0.00	2	862	6.25
						SREM	0.00			7.75
DMA7-RA/			AB	241		(0)	0.00			
			AA	241		(0)	0.00	1	863	1.50
			U	261		(0)	0.00	2	864	6.25
						SREM	0.00			7.75
DMA8-INT			AB*	81		(0)	0.00			
			AA*	81		(0)	0.00	1	865	1.50
			K	259		(0)	0.00	2	866	4.75
						SREM	0.00			6.25
DMA8-MAB	18/		AB*	48		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. #H5536-8
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	18/		AA*	48		(0)	0.00	1	A67	1.50
	18/		W*	36		(0)	0.00	2	A68	4.00
						SREM	0.00			5.50
DMA8-MR/			AB	243		(0)	0.00			
			AA	243		(0)	0.00	1	A69	1.50
			W	260		(0)	0.00	2	A70	4.75
						SREM	0.00			6.25
DMA8-RA/			AB	244		(0)	0.00			
			AA	244		(0)	0.00	1	A71	1.50
			W	261		(0)	0.00	2	A72	4.75
						SREM	0.00			6.25
INTD-F/			F	250		(0)	0.00			
			Y	271		(0)	0.00	1	A73	12.00
						SREM	0.00			12.00
INTD-G/			G	250		(0)	0.00			
			Y	272		(0)	0.00	1	A74	12.00
						SREM	0.00			12.00
INTD-H/			H	250		(0)	0.00			
			Y	273		(0)	0.00	1	A75	11.00
						SREM	0.00			11.00
INTD-J/			J	250		(0)	0.00			
			Y	274		(0)	0.00	1	A76	10.00
						SREM	0.00			10.00
INTD-K/			K	250		(0)	0.00			
			Y	275		(0)	0.00	1	A77	10.00
						SREM	0.00			10.00
INTD-L/			~~X~~ L	250		(0)	0.00			
			Y	276		(0)	0.00	1	A78	8.00
						SREM	0.00			8.00
~~INTD-LR~~			~~L~~	~~250~~		~~(0)~~	~~0.00~~			
INTD-M/			M	250		(0)	0.00			
			Y	277		(0)	0.00	1	A79	9.00
						SREM	0.00			9.00
INTD-N/			N	250		(0)	0.00			
			Y	278		(0)	0.00	1	A80	9.00
						SREM	0.00			9.00
INTD-P/			P	250		(0)	0.00			
			Y	279		(0)	0.00	1	A81	8.00
						SREM	0.00			8.00

I/O EXPANSION MP32 BACKPLANE — JOB NO. #H5536-8
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
~~INTD-R/~~			~~R~~	~~250~~						
INTD-R/			Y	280		(0)	0.00			
INTL-S/			S	250		(0)	0.00			
			Y	281		(0)	0.00	1	A82	8.00
						SREM	0.00			8.00
INTL-T/			T	250		(0)	0.00			
			Y	282		(0)	0.00	1	A83	7.00
						SREM	0.00			7.00
INTD-U/			U	250		(0)	0.00			
			Y	283		(0)	0.00	1	A84	7.00
						SREM	0.00			7.00
INTD-V/			V	250		(0)	0.00			
			Y	284		(0)	0.00	1	A85	7.00
						SREM	0.00			7.00
INTD-W/			W	250		(0)	0.00			
			Y	285		(0)	0.00	1	A86	7.00
						SREM	0.00			7.00
INTD-X/			X	250		(0)	0.00			
			Y	286		(0)	0.00	1	A87	7.00
						SREM	0.00			7.00
INTP-F/			F	249		(0)	0.00			
			Y*	71		(0)	0.00	1	A88	12.00
						SREM	0.00			12.00
INTP-G/			G	249		(0)	0.00			
			Y*	72		(0)	0.00	1	A89	11.00
						SREM	0.00			11.00
INTP-H/			H	249		(0)	0.00			
			Y*	73		(0)	0.00	1	A90	11.00
						SREM	0.00			11.00
INTP-J/			J	249		(0)	0.00			
			Y*	74		(0)	0.00	1	A91	10.00
						SREM	0.00			10.00
INTP-K/			K	249		(0)	0.00			
			Y*	75		(0)	0.00	1	A92	10.00
						SREM	0.00			10.00
INTP-L/			~~X~~ L	249		(0)	0.00			
			Y*	76		(0)	0.00	1	A93	8.00
						SREM	0.00			8.00
~~INTP-LR~~			~~L~~	~~249~~		~~(0)~~	~~0.00~~			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
INTP-M/			M	249		(0)	0.00			
			Y*	77		(0)	0.00	1	894	9.00
						SREM	0.00			9.00
INTP-N/			N	249		(0)	0.00			
			Y*	78		(0)	0.00	1	895	9.00
						SREM	0.00			9.00
INTP-P/			P	249		(0)	0.00			
			Y*	79		(0)	0.00	1	896	8.00
						SREM	0.00			8.00
INTP-R/			R	249						
INTP-R/			Y*	80		(0)	0.00			
INTP-S/			S	249		(0)	0.00			
			Y*	81		(0)	0.00	1	897	8.00
						SREM	0.00			8.00
INTP-T/			T	249		(0)	0.00			
			Y*	82		(0)	0.00	1	898	7.00
						SREM	0.00			7.00
INTP-U/			U	249		(0)	0.00			
			Y*	83		(0)	0.00	1	899	7.00
						SREM	0.00			7.00
INTP-V/			V	249		(0)	0.00			
			Y*	84		(0)	0.00	1	900	7.00
						SREM	0.00			7.00
INTP-W/			W	249		(0)	0.00			
			Y*	85		(0)	0.00	1	901	7.00
						SREM	0.00			7.00
INTP-X/			X	249		(0)	0.00			
			Y*	86		(0)	0.00	1	902	7.00
						SREM	0.00			7.00
INT1E/			AC*	76		(0)	0.00			
			Z*	76		(0)	0.00	1	903	3.00
			Y*	53		(0)	0.00	2	904	4.00
						SREM	0.00			7.00
INT2E/			AC	260		(0)	0.00			
			Z	260		(0)	0.00	1	905	3.00
			Y	253		(0)	0.00	2	906	2.00
						SREM	0.00			5.00
INT3E/			AC	261		(0)	0.00			
			Z	261		(0)	0.00	1	907	3.00

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEG	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			Y*	54		(0)	0.00	2	908	2.00
						SREM	0.00			5.00
INT4E/			AC	262		(0)	0.00			
			Z	262		(0)	0.00	1	909	3.00
			Y	254		(0)	0.00	2	910	2.00
						SREM	0.00			5.00
INT5E/			AC*	77		(0)	0.00			
			Z*	77		(0)	0.00	1	911	3.00
			Y*	55		(0)	0.00	2	912	4.00
						SREM	0.00			7.00
INT6E/			AC	263		(0)	0.00			
			Z	263		(0)	0.00	1	913	3.00
			Y	255		(0)	0.00	2	914	2.00
						SREM	0.00			5.00
INT7E/			AC	264		(0)	0.00			
			Z	264		(0)	0.00	1	915	3.00
			Y*	56		(0)	0.00	2	916	2.50
						SREM	0.00			5.50
INT8E/			AC	265		(0)	0.00			
			Z	265		(0)	0.00	1	917	3.00
			Y	256		(0)	0.00	2	918	2.50
						SREM	0.00			5.50
MO5-INTO	/		E	250		(0)	0.00			
	/		Y	287		(0)	0.00	1	919	13.00
						SREM	0.00			13.00
MO5-INTP	/		E	249		(0)	0.00			
	/		Y*	87		(0)	0.00	1	920	13.00
						SREM	0.00			13.00
MO5-SPT/			E	227		(0)	0.00			
			Y	288		(0)	0.00	1	921	15.00
						SREM	0.00			15.00
MO5-SSFL	/		E	251		(0)	0.00			
	/		Y*	88		(0)	0.00	1	922	13.00
						SREM	0.00			13.00
MR/			AC	253		(0)	0.00			
			Z	253		(0)	0.00	1	923	3.00
			AA*	46		(0)	0.00	2	924	3.00
			AB*	46		(0)	0.00	1	925	1.50
			X*	46		(0)	0.00	2	926	3.50
			W*	46		(0)	0.00	1	927	1.50
			V*	46		(0)	0.00	2	928	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B — DATE 07/10/78

CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			U*	46		(0)	0.00	1	929	1.50
			T*	46		(0)	0.00	2	930	1.50
			S*	46		(0)	0.00	1	931	1.50
			R*	46		(0)	0.00	2	932	1.50
			P*	46		(0)	0.00	1	933	1.50
			N*	46		(0)	0.00	2	934	1.50
			K*	46		(0)	0.00	1	935	1.50
			L*	46		(0)	0.00	2	936	1.50
			K*	46		(0)	0.00	1	937	1.50
			J*	46		(0)	0.00	2	938	1.50
			H*	46		(0)	0.00	1	939	1.50
			G*	46		(0)	0.00	2	940	1.50
			F*	46		(0)	0.00	1	941	1.50
			E*	46		(0)	0.00	2	942	1.50
						SREM	0.00			35.00
PROG PRO	T/		AC*	91		(0)	0.00			
	T/		AB	291		(0)	0.00	1	943	1.50
	T/		AA	291		(0)	0.00	2	944	1.50
	T/		Z*	91		(0)	0.00	1	945	1.75
	T/		X	291		(0)	0.00	2	946	2.00
	T/		W	291		(0)	0.00	1	947	1.50
	T/		V	291		(0)	0.00	2	948	1.50
	T/		U	291		(0)	0.00	1	949	1.50
	T/		T	291		(0)	0.00	2	950	1.50
	T/		S	291		(0)	0.00	1	951	1.50
	T/		R	291		(0)	0.00	2	952	1.50
	T/		P	291		(0)	0.00	1	953	1.50
	T/		N	291		(0)	0.00	2	954	1.50
	T/		M	291		(0)	0.00	1	955	1.50
	T/		L	291		(0)	0.00	2	956	1.50
	T/		K	291		(0)	0.00	1	957	1.50
	T/		J	291		(0)	0.00	2	958	1.50
	T/		H	291		(0)	0.00	1	959	1.50
	T/		G	291		(0)	0.00	2	960	1.50
	T/		F	291		(0)	0.00	1	961	1.50
						SREM	0.00			29.25
RL01/			AC*	4		(0)	0.00			
			AB	204		(0)	0.00	1	962	1.50
			AA	204		(0)	0.00	2	963	1.50
			Z*	4		(0)	0.00	1	964	1.75
			X	204		(0)	0.00	2	965	2.00
			W	204		(0)	0.00	1	966	1.50
			V	204		(0)	0.00	2	967	1.50
			U	204		(0)	0.00	1	968	1.50
			T	204		(0)	0.00	2	969	1.50
			S	204		(0)	0.00	1	970	1.50
			R	204		(0)	0.00	2	971	1.50
			P	204		(0)	0.00	1	972	1.50
			N	204		(0)	0.00	2	973	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B — DATE 07/10/78

CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			M	204		(0)	0.00	1	974	1.50
			L	204		(0)	0.00	2	975	1.50
			K	204		(0)	0.00	1	976	1.50
			J	204		(0)	0.00	2	977	1.50
			H	204		(0)	0.00	1	978	1.50
			G	204		(0)	0.00	2	979	1.50
			F	204		(0)	0.00	1	980	1.50
			E	204		(0)	0.00	2	981	1.50
						SREM	0.00			30.75
RL02/			AC*	6		(0)	0.00			
			AB	206		(0)	0.00	1	982	1.50
			AA	206		(0)	0.00	2	983	1.50
			Z*	6		(0)	0.00	1	984	1.75
			X	206		(0)	0.00	2	985	2.00
			W	206		(0)	0.00	1	986	1.50
			V	206		(0)	0.00	2	987	1.50
			U	206		(0)	0.00	1	988	1.50
			T	206		(0)	0.00	2	989	1.50
			S	206		(0)	0.00	1	990	1.50
			R	206		(0)	0.00	2	991	1.50
			P	206		(0)	0.00	1	992	1.50
			N	206		(0)	0.00	2	993	1.50
			M	206		(0)	0.00	1	994	1.50
			L	206		(0)	0.00	2	995	1.50
			K	206		(0)	0.00	1	996	1.50
			J	206		(0)	0.00	2	997	1.50
			H	206		(0)	0.00	1	998	1.50
			G	206		(0)	0.00	2	999	1.50
			F	206		(0)	0.00	1	1000	1.50
			E	206		(0)	0.00	2	1001	1.50
						SREM	0.00			30.75
RL03/			AC*	8		(0)	0.00			
			AB	208		(0)	0.00	1	1002	1.50
			AA	208		(0)	0.00	2	1003	1.50
			Z*	8		(0)	0.00	1	1004	1.75
			X	208		(0)	0.00	2	1005	2.00
			W	208		(0)	0.00	1	1006	1.50
			V	208		(0)	0.00	2	1007	1.50
			U	208		(0)	0.00	1	1008	1.50
			T	208		(0)	0.00	2	1009	1.50
			S	208		(0)	0.00	1	1010	1.50
			R	208		(0)	0.00	2	1011	1.50
			P	208		(0)	0.00	1	1012	1.50
			N	208		(0)	0.00	2	1013	1.50
			M	208		(0)	0.00	1	1014	1.50
			L	208		(0)	0.00	2	1015	1.50
			K	208		(0)	0.00	1	1016	1.50
			J	208		(0)	0.00	2	1017	1.50
			H	208		(0)	0.00	1	1018	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. UH5536-B
CDC/LA JOLLA *** STRING LIST *** — DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			G	208		(0)	0.00	2	1019	1.50
			F	208		(0)	0.00	1	1020	1.50
			E	208		(0)	0.00	2	1021	1.50
						SREM	0.00			30.75
RD04/			AC*	23		(0)	0.00			
			AB	210		(0)	0.00	1	1022	2.50
			AA	210		(0)	0.00	2	1023	1.50
			Z*	23		(0)	0.00	1	1024	3.00
			X	210		(0)	0.00	2	1025	3.00
			W	210		(0)	0.00	1	1026	1.50
			V	210		(0)	0.00	2	1027	1.50
			U	210		(0)	0.00	1	1028	1.50
			T	210		(0)	0.00	2	1029	1.50
			S	210		(0)	0.00	1	1030	1.50
			R	210		(0)	0.00	2	1031	1.50
			P	210		(0)	0.00	1	1032	1.50
			N	210		(0)	0.00	2	1033	1.50
			M	210		(0)	0.00	1	1034	1.50
			L	210		(0)	0.00	2	1035	1.50
			K	210		(0)	0.00	1	1036	1.50
			J	210		(0)	0.00	2	1037	1.50
			H	210		(0)	0.00	1	1038	1.50
			G	210		(0)	0.00	2	1039	1.50
			F	210		(0)	0.00	1	1040	1.50
			E	210		(0)	0.00	2	1041	1.50
						SREM	0.00			34.00
RD05/			AC*	27		(0)	0.00			
			AB	214		(0)	0.00	1	1042	2.50
			AA	214		(0)	0.00	2	1043	1.50
			Z*	27		(0)	0.00	1	1044	3.00
			X	214		(0)	0.00	2	1045	3.00
			W	214		(0)	0.00	1	1046	1.50
			V	214		(0)	0.00	2	1047	1.50
			U	214		(0)	0.00	1	1048	1.50
			T	214		(0)	0.00	2	1049	1.50
			S	214		(0)	0.00	1	1050	1.50
			R	214		(0)	0.00	2	1051	1.50
			P	214		(0)	0.00	1	1052	1.50
			N	214		(0)	0.00	2	1053	1.50
			M	214		(0)	0.00	1	1054	1.50
			L	214		(0)	0.00	2	1055	1.50
			K	214		(0)	0.00	1	1056	1.50
			J	214		(0)	0.00	2	1057	1.50
			H	214		(0)	0.00	1	1058	1.50
			G	214		(0)	0.00	2	1059	1.50
			F	214		(0)	0.00	1	1060	1.50
			E	214		(0)	0.00	2	1061	1.50
						SREM	0.00			34.00
RD06/			AC*	31		(0)	0.00			

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			AB	218		(0)	0.00	1	1062	2.50
			AA	218		(0)	0.00	2	1063	1.50
			Z*	31		(0)	0.00	1	1064	3.00
			X	218		(0)	0.00	2	1065	3.00
			W	218		(0)	0.00	1	1066	1.50
			V	218		(0)	0.00	2	1067	1.50
			U	218		(0)	0.00	1	1068	1.50
			T	218		(0)	0.00	2	1069	1.50
			S	218		(0)	0.00	1	1070	1.50
			R	218		(0)	0.00	2	1071	1.50
			P	218		(0)	0.00	1	1072	1.50
			N	218		(0)	0.00	2	1073	1.50
			M	218		(0)	0.00	1	1074	1.50
			L	218		(0)	0.00	2	1075	1.50
			K	218		(0)	0.00	1	1076	1.50
			J	218		(0)	0.00	2	1077	1.50
			H	218		(0)	0.00	1	1078	1.50
			G	218		(0)	0.00	2	1079	1.50
			F	218		(0)	0.00	1	1080	1.50
			E	218		(0)	0.00	2	1081	1.50
						SREM	0.00			34.00
RD07/			AC*	34		(0)	0.00			
			AB	221		(0)	0.00	1	1082	2.50
			AA	221		(0)	0.00	2	1083	1.50
			Z*	34		(0)	0.00	1	1084	3.00
			X	221		(0)	0.00	2	1085	3.00
			W	221		(0)	0.00	1	1086	1.50
			V	221		(0)	0.00	2	1087	1.50
			U	221		(0)	0.00	1	1088	1.50
			T	221		(0)	0.00	2	1089	1.50
			S	221		(0)	0.00	1	1090	1.50
			R	221		(0)	0.00	2	1091	1.50
			P	221		(0)	0.00	1	1092	1.50
			N	221		(0)	0.00	2	1093	1.50
			M	221		(0)	0.00	1	1094	1.50
			L	221		(0)	0.00	2	1095	1.50
			K	221		(0)	0.00	1	1096	1.50
			J	221		(0)	0.00	2	1097	1.50
			H	221		(0)	0.00	1	1098	1.50
			G	221		(0)	0.00	2	1099	1.50
			F	221		(0)	0.00	1	1100	1.50
			E	221		(0)	0.00	2	1101	1.50
						SREM	0.00			34.00
RD08/			AC*	54		(0)	0.00			
			Z*	54		(0)	0.00	1	1102	3.00
			AA	224		(0)	0.00	2	1103	4.25
			AB	224		(0)	0.00	1	1104	1.50
			X	224		(0)	0.00	2	1105	3.50
			W	224		(0)	0.00	1	1106	1.50

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			V	224		(0)	0.00	2	1107	1.50
			U	224		(0)	0.00	1	1108	1.50
			T	224		(0)	0.00	2	1109	1.50
			S	224		(0)	0.00	1	1110	1.50
			R	224		(0)	0.00	2	1111	1.50
			P	224		(0)	0.00	1	1112	1.50
			N	224		(0)	0.00	2	1113	1.50
			M	224		(0)	0.00	1	1114	1.50
			L	224		(0)	0.00	2	1115	1.50
			K	224		(0)	0.00	1	1116	1.50
			J	224		(0)	0.00	2	1117	1.50
			H	224		(0)	0.00	1	1118	1.50
			G	224		(0)	0.00	2	1119	1.50
			F	224		(0)	0.00	1	1120	1.50
			E	224		(0)	0.00	2	1121	1.50
						SREM	0.00			30.25
RD09/			AC*	56		(0)	0.00			
			Z*	56		(0)	0.00	1	1122	3.00
			X	226		(0)	0.00	2	1123	6.25
			W	226		(0)	0.00	1	1124	1.50
			V	226		(0)	0.00	2	1125	1.50
			U	226		(0)	0.00	1	1126	1.50
			T	226		(0)	0.00	2	1127	1.50
			S	226		(0)	0.00	1	1128	1.50
			R	226		(0)	0.00	2	1129	1.50
			P	226		(0)	0.00	1	1130	1.50
			N	226		(0)	0.00	2	1131	1.50
			M	226		(0)	0.00	1	1132	1.50
			L	226		(0)	0.00	2	1133	1.50
			K	226		(0)	0.00	1	1134	1.50
			J	226		(0)	0.00	2	1135	1.50
			H	226		(0)	0.00	1	1136	1.50
			G	226		(0)	0.00	2	1137	1.50
			F	226		(0)	0.00	1	1138	1.50
			E	226		(0)	0.00	2	1139	1.50
						SREM	0.00			33.25
RD10/			AC*	59		(0)	0.00			
			Z*	59		(0)	0.00	1	1140	3.00
			X	229		(0)	0.00	2	1141	6.25
			W	229		(0)	0.00	1	1142	1.50
			V	229		(0)	0.00	2	1143	1.50
			U	229		(0)	0.00	1	1144	1.50
			T	229		(0)	0.00	2	1145	1.50
			S	229		(0)	0.00	1	1146	1.50
			R	229		(0)	0.00	2	1147	1.50
			P	229		(0)	0.00	1	1148	1.50
			N	229		(0)	0.00	2	1149	1.50
			M	229		(0)	0.00	1	1150	1.50
			L	229		(0)	0.00	2	1151	1.50

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			K	229		(0)	0.00	1	1152	1.50
			J	229		(0)	0.00	2	1153	1.50
			H	229		(0)	0.00	1	1154	1.50
			G	229		(0)	0.00	2	1155	1.50
			F	229		(0)	0.00	1	1156	1.50
			E	229		(0)	0.00	2	1157	1.50
						SREM	0.00			33.25
RD11/			AC	258		(0)	0.00			
			Z	258		(0)	0.00	1	1158	3.00
			X	231		(0)	0.00	2	1159	6.50
			W	231		(0)	0.00	1	1160	1.50
			V	231		(0)	0.00	2	1161	1.50
			U	231		(0)	0.00	1	1162	1.50
			T	231		(0)	0.00	2	1163	1.50
			S	231		(0)	0.00	1	1164	1.50
			R	231		(0)	0.00	2	1165	1.50
			P	231		(0)	0.00	1	1166	1.50
			N	231		(0)	0.00	2	1167	1.50
			M	231		(0)	0.00	1	1168	1.50
			L	231		(0)	0.00	2	1169	1.50
			K	231		(0)	0.00	1	1170	1.50
			J	231		(0)	0.00	2	1171	1.50
			H	231		(0)	0.00	1	1172	1.50
			G	231		(0)	0.00	2	1173	1.50
			F	231		(0)	0.00	1	1174	1.50
			E	231		(0)	0.00	2	1175	1.50
						SREM	0.00			32.50
RD12/			AC*	63		(0)	0.00			
			Z*	63		(0)	0.00	1	1176	3.00
			X	234		(0)	0.00	2	1177	6.25
			W	234		(0)	0.00	1	1178	1.50
			V	234		(0)	0.00	2	1179	1.50
			U	234		(0)	0.00	1	1180	1.50
			T	234		(0)	0.00	2	1181	1.50
			S	234		(0)	0.00	1	1182	1.50
			R	234		(0)	0.00	2	1183	1.50
			P	234		(0)	0.00	1	1184	1.50
			N	234		(0)	0.00	2	1185	1.50
			M	234		(0)	0.00	1	1186	1.50
			L	234		(0)	0.00	2	1187	1.50
			K	234		(0)	0.00	1	1188	1.50
			J	234		(0)	0.00	2	1189	1.50
			H	234		(0)	0.00	1	1190	1.50
			G	234		(0)	0.00	2	1191	1.50
			F	234		(0)	0.00	1	1192	1.50
			E	234		(0)	0.00	2	1193	1.50
						SREM	0.00			33.25
RD13/			AC*	65		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B — DATE 07/10/76

CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			Z*	65		(0)	0.00	1	1194	3.00
			X	236		(0)	0.00	2	1195	6.25
			W	236		(0)	0.00	1	1196	1.50
			V	236		(0)	0.00	2	1197	1.50
			U	236		(0)	0.00	1	1198	1.50
			T	236		(0)	0.00	2	1199	1.50
			S	236		(0)	0.00	1	1200	1.50
			R	236		(0)	0.00	2	1201	1.50
			P	236		(0)	0.00	1	1202	1.50
			N	236		(0)	0.00	2	1203	1.50
			M	236		(0)	0.00	1	1204	1.50
			L	236		(0)	0.00	2	1205	1.50
			K	236		(0)	0.00	1	1206	1.50
			J	236		(0)	0.00	2	1207	1.50
			H	236		(0)	0.00	1	1208	1.50
			G	236		(0)	0.00	2	1209	1.50
			F	236		(0)	0.00	1	1210	1.50
			E	236		(0)	0.00	2	1211	1.50
						SREM	0.00			33.25
RD14/			AC*	67		(0)	0.00			
			Z*	67		(0)	0.00	1	1212	3.00
			X	239		(0)	0.00	2	1213	5.50
			W	239		(0)	0.00	1	1214	1.50
			V	239		(0)	0.00	2	1215	1.50
			U	239		(0)	0.00	1	1216	1.50
			T	239		(0)	0.00	2	1217	1.50
			S	239		(0)	0.00	1	1218	1.50
			R	239		(0)	0.00	2	1219	1.50
			P	239		(0)	0.00	1	1220	1.50
			N	239		(0)	0.00	2	1221	1.50
			M	239		(0)	0.00	1	1222	1.50
			L	239		(0)	0.00	2	1223	1.50
			K	239		(0)	0.00	1	1224	1.50
			J	239		(0)	0.00	2	1225	1.50
			H	239		(0)	0.00	1	1226	1.50
			G	239		(0)	0.00	2	1227	1.50
			F	239		(0)	0.00	1	1228	1.50
			E	239		(0)	0.00	2	1229	1.50
						SREM	0.00			32.50
RD15/			AC*	69		(0)	0.00			
			Z*	69		(0)	0.00	1	1230	3.00
			X	241		(0)	0.00	2	1231	5.50
			W	241		(0)	0.00	1	1232	1.50
			V	241		(0)	0.00	2	1233	1.50
			U	241		(0)	0.00	1	1234	1.50
			T	241		(0)	0.00	2	1235	1.50
			S	241		(0)	0.00	1	1236	1.50
			R	241		(0)	0.00	2	1237	1.50
			P	241		(0)	0.00	1	1238	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B — DATE 07/10/76

CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			N	241		(0)	0.00	2	1239	1.50
			M	241		(0)	0.00	1	1240	1.50
			L	241		(0)	0.00	2	1241	1.50
			K	241		(0)	0.00	1	1242	1.50
			J	241		(0)	0.00	2	1243	1.50
			H	241		(0)	0.00	1	1244	1.50
			G	241		(0)	0.00	2	1245	1.50
			F	241		(0)	0.00	1	1246	1.50
			E	241		(0)	0.00	2	1247	1.50
						SREM	0.00			32.50
RD16/			AC*	71		(0)	0.00			
			Z*	71		(0)	0.00	1	1248	3.00
			X	244		(0)	0.00	2	1249	5.50
			W	244		(0)	0.00	1	1250	1.50
			V	244		(0)	0.00	2	1251	1.50
			U	244		(0)	0.00	1	1252	1.50
			T	244		(0)	0.00	2	1253	1.50
			S	244		(0)	0.00	1	1254	1.50
			R	244		(0)	0.00	2	1255	1.50
			P	244		(0)	0.00	1	1256	1.50
			N	244		(0)	0.00	2	1257	1.50
			M	244		(0)	0.00	1	1258	1.50
			L	244		(0)	0.00	2	1259	1.50
			K	244		(0)	0.00	1	1260	1.50
			J	244		(0)	0.00	2	1261	1.50
			H	244		(0)	0.00	1	1262	1.50
			G	244		(0)	0.00	2	1263	1.50
			F	244		(0)	0.00	1	1264	1.50
			E	244		(0)	0.00	2	1265	1.50
						SREM	0.00			32.50
HEAD-SST	B/		AC*	75		(0)	0.00			
	B/		Z*	75		(0)	0.00	1	1266	3.00
	B/		AA	248		(0)	0.00	2	1267	5.50
	B/		AB	248		(0)	0.00	1	1268	1.50
	B/		X	248		(0)	0.00	2	1269	5.50
	B/		W	248		(0)	0.00	1	1270	1.50
	B/		V	248		(0)	0.00	2	1271	1.50
	B/		U	248		(0)	0.00	1	1272	1.50
	B/		T	248		(0)	0.00	2	1273	1.50
	B/		S	248		(0)	0.00	1	1274	1.50
	B/		R	248		(0)	0.00	2	1275	1.50
	B/		P	248		(0)	0.00	1	1276	1.50
	B/		N	248		(0)	0.00	2	1277	1.50
	B/		M	248		(0)	0.00	1	1278	1.50
	B/		L	248		(0)	0.00	2	1279	1.50
	B/		K	248		(0)	0.00	1	1280	1.50
	B/		J	248		(0)	0.00	2	1281	1.50
	B/		H	248		(0)	0.00	1	1282	1.50
	B/		G	248		(0)	0.00	2	1283	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5530-B — DATE 07/10/78
CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
	B/		F	248		(0)	0.00	1	1284	1.50
	B/		E	248		(0)	0.00	2	1283	1.50
						SREM	0.00			37.50
REJECT/			AC*	33		(0)	0.00			
			AB	220		(0)	0.00	1	1286	2.50
			AA	220		(0)	0.00	2	1287	1.50
			Z*	33		(0)	0.00	1	1288	3.00
			X	220		(0)	0.00	2	1289	3.00
			W	220		(0)	0.00	1	1290	1.50
			V	220		(0)	0.00	2	1291	1.50
			U	220		(0)	0.00	1	1292	1.50
			T	220		(0)	0.00	2	1293	1.50
			S	220		(0)	0.00	1	1294	1.50
			R	220		(0)	0.00	2	1295	1.50
			P	220		(0)	0.00	1	1296	1.50
			N	220		(0)	0.00	2	1297	1.50
			M	220		(0)	0.00	1	1298	1.50
			L	220		(0)	0.00	2	1299	1.50
			K	220		(0)	0.00	1	1300	1.50
			J	220		(0)	0.00	2	1301	1.50
			H	220		(0)	0.00	1	1302	1.50
			G	220		(0)	0.00	2	1303	1.50
			F	220		(0)	0.00	1	1304	1.50
			E	220		(0)	0.00	2	1305	1.50
						SREM	0.00			34.00
REMOTE/			AB	227		(0)	0.00			
			AA	227		(0)	0.00	1	1306	1.50
			AA	301		(0)	0.00	2	1307	12.00
			AB	301		(0)	0.00	1	1308	1.50
						SREM	0.00			15.00
REPLY/			AC*	29		(0)	0.00			
			AB	216		(0)	0.00	1	1309	2.50
			AA	216		(0)	0.00	2	1310	1.50
			Z*	29		(0)	0.00	1	1311	3.00
			X	216		(0)	0.00	2	1312	3.00
			W	216		(0)	0.00	1	1313	1.50
			V	216		(0)	0.00	2	1314	1.50
			U	216		(0)	0.00	1	1315	1.50
			T	216		(0)	0.00	2	1316	1.50
			S	216		(0)	0.00	1	1317	1.50
			R	216		(0)	0.00	2	1318	1.50
			P	216		(0)	0.00	1	1319	1.50
			N	216		(0)	0.00	2	1320	1.50
			M	216		(0)	0.00	1	1321	1.50
			L	216		(0)	0.00	2	1322	1.50
			K	216		(0)	0.00	1	1323	1.50
			J	216		(0)	0.00	2	1324	1.50
			H	216		(0)	0.00	1	1325	1.50

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CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			G	216		(0)	0.00	2	1326	1.50
			F	216		(0)	0.00	1	1327	1.50
			E	216		(0)	0.00	2	1328	1.50
						SREM	0.00			34.00
RPINTXX/			AB*	49		(0)	0.00			
			AA*	49		(0)	0.00	1	1329	1.50
			Y*	70		(0)	0.00	2	1330	4.75
						SREM	0.00			6.25
RPINTYY/			AB	249		(0)	0.00			
			AA	249		(0)	0.00	1	1331	1.50
			Y	270		(0)	0.00	2	1332	4.75
						SREM	0.00			6.25
RTERM/			AC*	26		(0)	0.00			
			Z*	26		(0)	0.00	1	1333	3.00
			X	213		(0)	0.00	2	1334	3.00
			W	213		(0)	0.00	1	1335	1.50
			V	213		(0)	0.00	2	1336	1.50
			U	213		(0)	0.00	1	1337	1.50
			T	213		(0)	0.00	2	1338	1.50
			S	213		(0)	0.00	1	1339	1.50
			R	213		(0)	0.00	2	1340	1.50
			P	213		(0)	0.00	1	1341	1.50
			N	213		(0)	0.00	2	1342	1.50
			M	213		(0)	0.00	1	1343	1.50
			L	213		(0)	0.00	2	1344	1.50
			K	213		(0)	0.00	1	1345	1.50
			J	213		(0)	0.00	2	1346	1.50
			H	213		(0)	0.00	1	1347	1.50
			G	213		(0)	0.00	2	1348	1.50
			F	213		(0)	0.00	1	1349	1.50
			E	213		(0)	0.00	2	1350	1.50
						SREM	0.00			30.00
SL01/			AC*	3		(0)	0.00			
			AB	203		(0)	0.00	1	1351	1.50
			AA	203		(0)	0.00	2	1352	1.50
			Z*	3		(0)	0.00	1	1353	1.75
			X	203		(0)	0.00	2	1354	2.00
			W	203		(0)	0.00	1	1355	1.50
			V	203		(0)	0.00	2	1356	1.50
			U	203		(0)	0.00	1	1357	1.50
			T	203		(0)	0.00	2	1358	1.50
			S	203		(0)	0.00	1	1359	1.50
			R	203		(0)	0.00	2	1360	1.50
			P	203		(0)	0.00	1	1361	1.50
			N	203		(0)	0.00	2	1362	1.50
			M	203		(0)	0.00	1	1363	1.50
			L	203		(0)	0.00	2	1364	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
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*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			K	203		(0)	0.00	1	1365	1.50
			J	203		(0)	0.00	2	1366	1.50
			H	203		(0)	0.00	1	1367	1.50
			G	203		(0)	0.00	2	1368	1.50
			F	203		(0)	0.00	1	1369	1.50
			E	203		(0)	0.00	2	1370	1.50
						$REM	0.00			30.75
SD02/			AC*	5		(0)	0.00			
			AB	205		(0)	0.00	1	1371	1.50
			AA	205		(0)	0.00	2	1372	1.50
			Z*	5		(0)	0.00	1	1373	1.75
			X	205		(0)	0.00	2	1374	2.00
			W	205		(0)	0.00	1	1375	1.50
			V	205		(0)	0.00	2	1376	1.50
			U	205		(0)	0.00	1	1377	1.50
			T	205		(0)	0.00	2	1378	1.50
			S	205		(0)	0.00	1	1379	1.50
			R	205		(0)	0.00	2	1380	1.50
			P	205		(0)	0.00	1	1381	1.50
			N	205		(0)	0.00	2	1382	1.50
			M	205		(0)	0.00	1	1383	1.50
			L	205		(0)	0.00	2	1384	1.50
			K	205		(0)	0.00	1	1385	1.50
			J	205		(0)	0.00	2	1386	1.50
			H	205		(0)	0.00	1	1387	1.50
			G	205		(0)	0.00	2	1388	1.50
			F	205		(0)	0.00	1	1389	1.50
			E	205		(0)	0.00	2	1390	1.50
						$REM	0.00			30.75
SD03/			AC*	7		(0)	0.00			
			AB	207		(0)	0.00	1	1391	1.50
			AA	207		(0)	0.00	2	1392	1.50
			Z*	7		(0)	0.00	1	1393	1.75
			X	207		(0)	0.00	2	1394	2.00
			W	207		(0)	0.00	1	1395	1.50
			V	207		(0)	0.00	2	1396	1.50
			U	207		(0)	0.00	1	1397	1.50
			T	207		(0)	0.00	2	1398	1.50
			S	207		(0)	0.00	1	1399	1.50
			R	207		(0)	0.00	2	1400	1.50
			P	207		(0)	0.00	1	1401	1.50
			N	207		(0)	0.00	2	1402	1.50
			M	207		(0)	0.00	1	1403	1.50
			L	207		(0)	0.00	2	1404	1.50
			K	207		(0)	0.00	1	1405	1.50
			J	207		(0)	0.00	2	1406	1.50
			H	207		(0)	0.00	1	1407	1.50
			G	207		(0)	0.00	2	1408	1.50
			F	207		(0)	0.00	1	1409	1.50

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SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			E	207		(0)	0.00	2	1410	1.50
						$REM	0.00			30.75
SD04/			AC*	9		(0)	0.00			
			AB	209		(0)	0.00	1	1411	1.50
			AA	209		(0)	0.00	2	1412	1.50
			Z*	9		(0)	0.00	1	1413	1.75
			X	209		(0)	0.00	2	1414	2.00
			W	209		(0)	0.00	1	1415	1.50
			V	209		(0)	0.00	2	1416	1.50
			U	209		(0)	0.00	1	1417	1.50
			T	209		(0)	0.00	2	1418	1.50
			S	209		(0)	0.00	1	1419	1.50
			R	209		(0)	0.00	2	1420	1.50
			P	209		(0)	0.00	1	1421	1.50
			N	209		(0)	0.00	2	1422	1.50
			M	209		(0)	0.00	1	1423	1.50
			L	209		(0)	0.00	2	1424	1.50
			K	209		(0)	0.00	1	1425	1.50
			J	209		(0)	0.00	2	1426	1.50
			H	209		(0)	0.00	1	1427	1.50
			G	209		(0)	0.00	2	1428	1.50
			F	209		(0)	0.00	1	1429	1.50
			E	209		(0)	0.00	2	1430	1.50
						$REM	0.00			30.75
SD05/			AC*	24		(0)	0.00			
			AB	211		(0)	0.00	1	1431	2.50
			AA	211		(0)	0.00	2	1432	1.50
			Z*	24		(0)	0.00	1	1433	3.00
			X	211		(0)	0.00	2	1434	3.00
			W	211		(0)	0.00	1	1435	1.50
			V	211		(0)	0.00	2	1436	1.50
			U	211		(0)	0.00	1	1437	1.50
			T	211		(0)	0.00	2	1438	1.50
			S	211		(0)	0.00	1	1439	1.50
			R	211		(0)	0.00	2	1440	1.50
			P	211		(0)	0.00	1	1441	1.50
			N	211		(0)	0.00	2	1442	1.50
			M	211		(0)	0.00	1	1443	1.50
			L	211		(0)	0.00	2	1444	1.50
			K	211		(0)	0.00	1	1445	1.50
			J	211		(0)	0.00	2	1446	1.50
			H	211		(0)	0.00	1	1447	1.50
			G	211		(0)	0.00	2	1448	1.50
			F	211		(0)	0.00	1	1449	1.50
			E	211		(0)	0.00	2	1450	1.50
						$REM	0.00			34.00
SD06/			AC*	26		(0)	0.00			
			AB	215		(0)	0.00	1	1451	2.50

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*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			AA	215		(0)	0.00	2	1452	1.50
			Z*	28		(0)	0.00	1	1453	3.00
			X	215		(0)	0.00	2	1454	3.00
			W	215		(0)	0.00	1	1455	1.50
			V	215		(0)	0.00	2	1456	1.50
			U	215		(0)	0.00	1	1457	1.50
			T	215		(0)	0.00	2	1458	1.50
			S	215		(0)	0.00	1	1459	1.50
			R	215		(0)	0.00	2	1460	1.50
			P	215		(0)	0.00	1	1461	1.50
			N	215		(0)	0.00	2	1462	1.50
			M	215		(0)	0.00	1	1463	1.50
			L	215		(0)	0.00	2	1464	1.50
			K	215		(0)	0.00	1	1465	1.50
			J	215		(0)	0.00	2	1466	1.50
			H	215		(0)	0.00	1	1467	1.50
			G	215		(0)	0.00	2	1468	1.50
			F	215		(0)	0.00	1	1469	1.50
			E	215		(0)	0.00	2	1470	1.50
						SREM	0.00			34.00
SL07/			AC*	32		(0)	0.00			
			AB	219		(0)	0.00	1	1471	2.50
			AA	219		(0)	0.00	2	1472	1.50
			Z*	32		(0)	0.00	1	1473	3.00
			X	219		(0)	0.00	2	1474	3.00
			W	219		(0)	0.00	1	1475	1.50
			V	219		(0)	0.00	2	1476	1.50
			U	219		(0)	0.00	1	1477	1.50
			T	219		(0)	0.00	2	1478	1.50
			S	219		(0)	0.00	1	1479	1.50
			R	219		(0)	0.00	2	1480	1.50
			P	219		(0)	0.00	1	1481	1.50
			N	219		(0)	0.00	2	1482	1.50
			M	219		(0)	0.00	1	1483	1.50
			L	219		(0)	0.00	2	1484	1.50
			K	219		(0)	0.00	1	1485	1.50
			J	219		(0)	0.00	2	1486	1.50
			H	219		(0)	0.00	1	1487	1.50
			G	219		(0)	0.00	2	1488	1.50
			F	219		(0)	0.00	1	1489	1.50
			E	219		(0)	0.00	2	1490	1.50
						SREM	0.00			34.00
SL08/			AC*	53		(0)	0.00			
			Z*	53		(0)	0.00	1	1491	3.00
			AA	223		(0)	0.00	2	1492	6.25
			AB	223		(0)	0.00	1	1493	1.50
			X	223		(0)	0.00	2	1494	3.50
			W	223		(0)	0.00	1	1495	1.50
			V	223		(0)	0.00	2	1496	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5538-B
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			U	223		(0)	0.00	1	1497	1.50
			T	223		(0)	0.00	2	1498	1.50
			S	223		(0)	0.00	1	1499	1.50
			R	223		(0)	0.00	2	1500	1.50
			P	223		(0)	0.00	1	1501	1.50
			N	223		(0)	0.00	2	1502	1.50
			M	223		(0)	0.00	1	1503	1.50
			L	223		(0)	0.00	2	1504	1.50
			K	223		(0)	0.00	1	1505	1.50
			J	223		(0)	0.00	2	1506	1.50
			H	223		(0)	0.00	1	1507	1.50
			G	223		(0)	0.00	2	1508	1.50
			F	223		(0)	0.00	1	1509	1.50
			E	223		(0)	0.00	2	1510	1.50
						SREM	0.00			38.25
SL09/			AC*	55		(0)	0.00			
			Z*	55		(0)	0.00	1	1511	3.00
			X	225		(0)	0.00	2	1512	6.25
			W	225		(0)	0.00	1	1513	1.50
			V	225		(0)	0.00	2	1514	1.50
			U	225		(0)	0.00	1	1515	1.50
			T	225		(0)	0.00	2	1516	1.50
			S	225		(0)	0.00	1	1517	1.50
			R	225		(0)	0.00	2	1518	1.50
			P	225		(0)	0.00	1	1519	1.50
			N	225		(0)	0.00	2	1520	1.50
			M	225		(0)	0.00	1	1521	1.50
			L	225		(0)	0.00	2	1522	1.50
			K	225		(0)	0.00	1	1523	1.50
			J	225		(0)	0.00	2	1524	1.50
			H	225		(0)	0.00	1	1525	1.50
			G	225		(0)	0.00	2	1526	1.50
			F	225		(0)	0.00	1	1527	1.50
			E	225		(0)	0.00	2	1528	1.50
						SREM	0.00			33.25
SL10/			AC*	58		(0)	0.00			
			Z*	58		(0)	0.00	1	1529	3.00
			X	226		(0)	0.00	2	1530	6.25
			W	228		(0)	0.00	1	1531	1.50
			V	228		(0)	0.00	2	1532	1.50
			U	228		(0)	0.00	1	1533	1.50
			T	228		(0)	0.00	2	1534	1.50
			S	228		(0)	0.00	1	1535	1.50
			R	228		(0)	0.00	2	1536	1.50
			P	228		(0)	0.00	1	1537	1.50
			N	228		(0)	0.00	2	1538	1.50
			M	228		(0)	0.00	1	1539	1.50
			L	228		(0)	0.00	2	1540	1.50
			K	228		(0)	0.00	1	1541	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B — DATE 07/10/78
CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			J	228		(0)	0.00	2	1542	1.50
			H	228		(0)	0.00	1	1543	1.50
			G	228		(0)	0.00	2	1544	1.50
			F	228		(0)	0.00	1	1545	1.50
			E	228		(0)	0.00	2	1546	1.50
						SREM	0.00			33.25
SD11/			AC*	60		(0)	0.00			
			Z*	60		(0)	0.00	1	1547	3.00
			X	230		(0)	0.00	2	1548	6.25
			W	230		(0)	0.00	1	1549	1.50
			V	230		(0)	0.00	2	1550	1.50
			U	230		(0)	0.00	1	1551	1.50
			T	230		(0)	0.00	2	1552	1.50
			S	230		(0)	0.00	1	1553	1.50
			R	230		(0)	0.00	2	1554	1.50
			P	230		(0)	0.00	1	1555	1.50
			N	230		(0)	0.00	2	1556	1.50
			M	230		(0)	0.00	1	1557	1.50
			L	230		(0)	0.00	2	1558	1.50
			K	230		(0)	0.00	1	1559	1.50
			J	230		(0)	0.00	2	1560	1.50
			H	230		(0)	0.00	1	1561	1.50
			G	230		(0)	0.00	2	1562	1.50
			F	230		(0)	0.00	1	1563	1.50
			E	230		(0)	0.00	2	1564	1.50
						SREM	0.00			33.25
SD12/			AC	259		(0)	0.00			
			Z	259		(0)	0.00	1	1565	3.00
			X	233		(0)	0.00	2	1566	5.50
			W	233		(0)	0.00	1	1567	1.50
			V	233		(0)	0.00	2	1568	1.50
			U	233		(0)	0.00	1	1569	1.50
			T	233		(0)	0.00	2	1570	1.50
			S	233		(0)	0.00	1	1571	1.50
			R	233		(0)	0.00	2	1572	1.50
			P	233		(0)	0.00	1	1573	1.50
			N	233		(0)	0.00	2	1574	1.50
			M	233		(0)	0.00	1	1575	1.50
			L	233		(0)	0.00	2	1576	1.50
			K	233		(0)	0.00	1	1577	1.50
			J	233		(0)	0.00	2	1578	1.50
			H	233		(0)	0.00	1	1579	1.50
			G	233		(0)	0.00	2	1580	1.50
			F	233		(0)	0.00	1	1581	1.50
			E	233		(0)	0.00	2	1582	1.50
						SREM	0.00			32.50
SD13/			AC*	64		(0)	0.00			
			Z*	64		(0)	0.00	1	1583	3.00

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B — DATE 07/10/78
CDC/LA JOLLA — *** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			X	235		(0)	0.00	2	1584	6.25
			W	235		(0)	0.00	1	1585	1.50
			V	235		(0)	0.00	2	1586	1.50
			U	235		(0)	0.00	1	1587	1.50
			T	235		(0)	0.00	2	1588	1.50
			S	235		(0)	0.00	1	1589	1.50
			R	235		(0)	0.00	2	1590	1.50
			P	235		(0)	0.00	1	1591	1.50
			N	235		(0)	0.00	2	1592	1.50
			M	235		(0)	0.00	1	1593	1.50
			L	235		(0)	0.00	2	1594	1.50
			K	235		(0)	0.00	1	1595	1.50
			J	235		(0)	0.00	2	1596	1.50
			H	235		(0)	0.00	1	1597	1.50
			G	235		(0)	0.00	2	1598	1.50
			F	235		(0)	0.00	1	1599	1.50
			E	235		(0)	0.00	2	1600	1.50
						SREM	0.00			33.25
SD14/			AC*	66		(0)	0.00			
			Z*	66		(0)	0.00	1	1601	3.00
			X	238		(0)	0.00	2	1602	5.50
			W	238		(0)	0.00	1	1603	1.50
			V	238		(0)	0.00	2	1604	1.50
			U	238		(0)	0.00	1	1605	1.50
			T	238		(0)	0.00	2	1606	1.50
			S	238		(0)	0.00	1	1607	1.50
			R	238		(0)	0.00	2	1608	1.50
			P	238		(0)	0.00	1	1609	1.50
			N	238		(0)	0.00	2	1610	1.50
			M	238		(0)	0.00	1	1611	1.50
			L	238		(0)	0.00	2	1612	1.50
			K	238		(0)	0.00	1	1613	1.50
			J	238		(0)	0.00	2	1614	1.50
			H	238		(0)	0.00	1	1615	1.50
			G	238		(0)	0.00	2	1616	1.50
			F	238		(0)	0.00	1	1617	1.50
			E	238		(0)	0.00	2	1618	1.50
						SREM	0.00			32.50
SD15/			AC*	68		(0)	0.00			
			Z*	68		(0)	0.00	1	1619	3.00
			X	240		(0)	0.00	2	1620	5.50
			W	240		(0)	0.00	1	1621	1.50
			V	240		(0)	0.00	2	1622	1.50
			U	240		(0)	0.00	1	1623	1.50
			T	240		(0)	0.00	2	1624	1.50
			S	240		(0)	0.00	1	1625	1.50
			R	240		(0)	0.00	2	1626	1.50
			P	240		(0)	0.00	1	1627	1.50
			N	240		(0)	0.00	2	1628	1.50

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			M	240		(0)	0.00	1	1629	1.50
			L	240		(0)	0.00	2	1630	1.50
			K	240		(0)	0.00	1	1631	1.50
			J	240		(0)	0.00	2	1632	1.50
			H	240		(0)	0.00	1	1633	1.50
			G	240		(0)	0.00	2	1634	1.50
			F	240		(0)	0.00	1	1635	1.50
			E	240		(0)	0.00	2	1636	1.50
						SREM	0.00			32.50
SD16/			AC*	70		(0)	0.00			
			Z*	70		(0)	0.00	1	1637	3.00
			X	243		(0)	0.00	2	1638	5.50
			W	243		(0)	0.00	1	1639	1.50
			V	243		(0)	0.00	2	1640	1.50
			U	243		(0)	0.00	1	1641	1.50
			T	243		(0)	0.00	2	1642	1.50
			S	243		(0)	0.00	1	1643	1.50
			R	243		(0)	0.00	2	1644	1.50
			P	243		(0)	0.00	1	1645	1.50
			N	243		(0)	0.00	2	1646	1.50
			M	243		(0)	0.00	1	1647	1.50
			L	243		(0)	0.00	2	1648	1.50
			K	243		(0)	0.00	1	1649	1.50
			J	243		(0)	0.00	2	1650	1.50
			H	243		(0)	0.00	1	1651	1.50
			G	243		(0)	0.00	2	1652	1.50
			F	243		(0)	0.00	1	1653	1.50
			E	243		(0)	0.00	2	1654	1.50
						SREM	0.00			32.50
SPT01/			AC*	57		(0)	0.00			
			Z*	57		(0)	0.00	1	1655	3.00
			Y	257		(0)	0.00	2	1656	1.50
						SREM	0.00			4.50
SPT02/			AC*	79		(0)	0.00			
			Z*	79		(0)	0.00	1	1657	3.00
			Y	258		(0)	0.00	2	1658	3.50
						SREM	0.00			6.50
SSEL01/			AC*	78		(0)	0.00			
			Z*	78		(0)	0.00	1	1659	3.00
			Y*	57		(0)	0.00	2	1660	3.50
						SREM	0.00			6.50
SSEL02/			AC*	96		(0)	0.00			
			Z*	96		(0)	0.00	1	1661	3.00
			Y*	58		(0)	0.00	2	1662	6.25
						SREM	0.00			9.25
STERM/			AC	255		(0)	0.00			

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B
CDC/LA JOLLA *** STRING LIST *** DATE 07/10/78

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			Z	255		(0)	0.00	1	1663	3.00
			X*	48		(0)	0.00	2	1664	3.50
			W*	48		(0)	0.00	1	1665	1.50
			V*	48		(0)	0.00	2	1666	1.50
			U*	48		(0)	0.00	1	1667	1.50
			T*	48		(0)	0.00	2	1668	1.50
			S*	48		(0)	0.00	1	1669	1.50
			R*	48		(0)	0.00	2	1670	1.50
			P*	48		(0)	0.00	1	1671	1.50
			N*	48		(0)	0.00	2	1672	1.50
			M*	48		(0)	0.00	1	1673	1.50
			L*	48		(0)	0.00	2	1674	1.50
			K*	48		(0)	0.00	1	1675	1.50
			J*	48		(0)	0.00	2	1676	1.50
			H*	48		(0)	0.00	1	1677	1.50
			G*	48		(0)	0.00	2	1678	1.50
			F*	48		(0)	0.00	1	1679	1.50
			E*	48		(0)	0.00	2	1680	1.50
						SREM	0.00			30.50
dEO/			AC*	92		(0)	0.00			
			AB	292		(0)	0.00	1	1681	1.50
			AA	292		(0)	0.00	2	1682	1.50
			Z*	92		(0)	0.00	1	1683	1.75
			X	292		(0)	0.00	2	1684	2.00
			W	292		(0)	0.00	1	1685	1.50
			V	292		(0)	0.00	2	1686	1.50
			U	292		(0)	0.00	1	1687	1.50
			T	292		(0)	0.00	2	1688	1.50
			S	292		(0)	0.00	1	1689	1.50
			R	292		(0)	0.00	2	1690	1.50
			P	292		(0)	0.00	1	1691	1.50
			N	292		(0)	0.00	2	1692	1.50
			M	292		(0)	0.00	1	1693	1.50
			L	292		(0)	0.00	2	1694	1.50
			K	292		(0)	0.00	1	1695	1.50
			J	292		(0)	0.00	2	1696	1.50
			H	292		(0)	0.00	1	1697	1.50
			G	292		(0)	0.00	2	1698	1.50
			F	292		(0)	0.00	1	1699	1.50
						SREM	0.00			29.25
WRITE/			AC*	90		(0)	0.00			
			AB	290		(0)	0.00	1	1700	1.50
			AA	290		(0)	0.00	2	1701	1.50
			Z*	90		(0)	0.00	1	1702	1.75
			X	290		(0)	0.00	2	1703	2.00
			W	290		(0)	0.00	1	1704	1.50
			V	290		(0)	0.00	2	1705	1.50
			U	290		(0)	0.00	1	1706	1.50
			T	290		(0)	0.00	2	1707	1.50

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*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
			B	290		(0)	0.00	1	1708	1.50
			R	290		(0)	0.00	2	1709	1.50
			P	290		(0)	0.00	1	1710	1.50
			N	290		(0)	0.00	2	1711	1.50
			M	290		(0)	0.00	1	1712	1.50
			L	290		(0)	0.00	2	1713	1.50
			K	290		(0)	0.00	1	1714	1.50
			J	290		(0)	0.00	2	1715	1.50
			H	290		(0)	0.00	1	1716	1.50
			G	290		(0)	0.00	2	1717	1.50
			F	290		(0)	0.00	1	1718	1.50
						SREM	0.00			29.25
XINT1/			AB*	4		(0)	0.00			
			AA*	4		(0)	0.00	1	1719	1.50
			Y*	59		(0)	0.00	2	1720	9.00
						SREM	0.00			10.50
XINT2/			AB*	5		(0)	0.00			
			AA*	5		(0)	0.00	1	1721	1.50
			Y	259		(0)	0.00	2	1722	9.00
						SREM	0.00			10.50
XINT3/			AB*	6		(0)	0.00			
			AA*	6		(0)	0.00	1	1723	1.50
			Y*	60		(0)	0.00	2	1724	9.00
						SREM	0.00			10.50
XINT4/			AB*	7		(0)	0.00			
			AA*	7		(0)	0.00	1	1725	1.50
			Y	260		(0)	0.00	2	1726	9.00
						SREM	0.00			10.50
XINT5/			AB*	41		(0)	0.00			
			AA*	41		(0)	0.00	1	1727	1.50
			Y*	61		(0)	0.00	2	1728	4.75
						SREM	0.00			6.25
XINT6/			AB*	42		(0)	0.00			
			AA*	42		(0)	0.00	1	1729	1.50
			Y	261		(0)	0.00	2	1730	4.75
						SREM	0.00			6.25
XINT7/			AB*	43		(0)	0.00			
			AA*	43		(0)	0.00	1	1731	1.50
			Y*	62		(0)	0.00	2	1732	4.75
						SREM	0.00			6.25
XINT8/			AB*	44		(0)	0.00			
			AA*	44		(0)	0.00	1	1733	1.50
			Y	262		(0)	0.00	2	1734	4.75

I/O EXPANSION MP32 BACKPLANE — JOB NO. WH5536-B
CDC/LA JOLLA — DATE 07/10/78
*** STRING LIST ***

SIGNAL NAME	OPT. ENT.	SEQ	SOCKET	PIN	IC TYPE		S/L	L	WIRE NO.	W/L
						SREM	0.00			6.25
NO. POINTS		1941/NO. OF STRINGS			206					

CUT ALONG LINE

COMMENT SHEET

MANUAL TITLE CDC® AT314, AU115, BU272, CW218 I/O Expansion Subsystem

Hardware Reference/Maintenance Manual

PUBLICATION NO. 60475540 REVISION C

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