TM 9-4935-473-14-2

TECHNICAL MANUAL

THEORY AND TROUBLESHOOTING

MAINTENANCE MANUAL

FOR

TEST SET, GUIDED MISSILE SYSTEM

(TSGMS)

TOW Airborne System

This copy is a reprint which includes current pages from Changes 1 thru 9

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1976

WARNING

Paint, primer, toluol and solvents are toxic and flammable. Keep away from heat and open flames. Use only in well-ventilated area. Avoid repeated contact with the skin.

Ensure that aircraft switches have been set for initial conditions for Control Monitor self test, per TM 9-1425-473-34, prior to performing self test.

LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with applicable regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands.

Dates of issue for original and changed pages are:

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3-97 - 3-99	1
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3-123	0
3-124	1
3-125	0
3-126	4
3-127	0
3-128 - 3-130	4
3-131	0
3-132	4
3-133	1
3-134	0
3-135	4
3-136 - 3-139	0
3-140	1
3-141	0
3-142 - 3-144	1
3-145 - 3-149	0
3-150 - 3-151	4
3-152 - 3-153	0
3-154	4
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3-164 Blank	0
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3-166 Blank	0
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3-168 Blank	0
3-169	0
3-170 Blank	0
3-171	0
3-172 Blank	0
3-173	0
3-174 Blank	0
3-175	0
3-176 Blank	0
3-177	0
3-178 Blank	0
3-179	1
3-180 Blank	0
3-181	0
3-182 Blank	0
3-183	0
3-184 Blank	0
3-185	0
3-186 Blank	0
3-187	1
3-188 Blank	0
3-189	0
3-190 Blank	0
3-190.1	7
3-190.2 Blank	7
3-191 - 3-196	0
3-197	2
3-198 - 3-200	0
3-201	1
3-202 - 3-204	0
3-205	1
3-206 - 3-215	0
3-216	2
3-217 - 3-219	0
3-220	2
3-221	0
3-222	2
3-223	0
3-224	7
3-225 - 3-229	1
3-230	6
3-231	1
3-232	6
3-233 - 3-236	1
3-237	8
3-238	1
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HEADQUARTERS,
Department of the Army
Washington, D. C., 30 September 1976

THEORY AND TROUBLESHOOTING MAINTENANCE MANUAL FOR TEST SET, GUIDED MISSILE SYSTEM (TSGMS)

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS - Continued

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1-1. Scope.

This manual describes the troubleshooting procedures and functional theory for the operator and DS/GS level maintenance of the Test Set, Guided Missile System (TSGMS). This manual should be used in conjunction with **TM 9-4935-473-14-1,** Operator, Direct Support and General Support Maintenance Manual For Test Set. Guided Missile System.

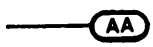
1-2. Explanation and Usage of Special Symbols.

The symbols used in this **manual** comply to specification ASA Y32.14, USAS Y32.2 and ANSI Y14.15a. The following special **symbols,** not covered in the specifications, are shown below. An explanation of usage for these special symbols is described below.

a.

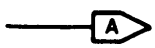
Reference designator used to key block or functional diagrams to associated theory

b.



Signal locator used to indicate the continuation of a signal from one sheet to another. The letters inside the oval key to corresponding letters located on another sheet or sheets. Input and output tables located in the diagram isolate AA to an exact location or another diagram.

c.

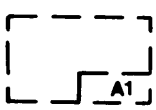


Signal locator used to show continuation of signal flow from one functional sheet to the next (i.e. , breaks on the right end of the functional sheet and continues on the left end of the next functional sheet).

d.

Signal flow indicator used for clarity when signal flow is not apparent.

e.

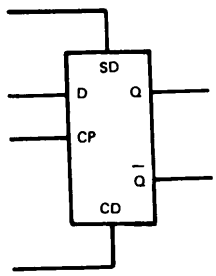


Hardware boundary identifies the circuit cards within a unit.

f.

Adjustment indicator points out on the diagram specific components which can be calibrated. R1 identifies the specific component to be adjusted.

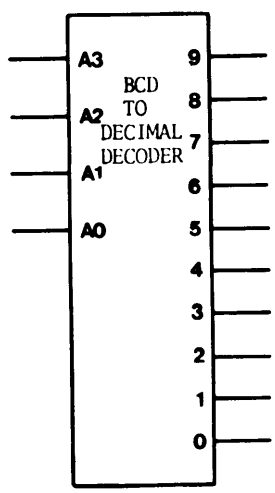
g.



Data latch. Produces outputs, (Q and $\overline{Q}$), as shown in truth table. The SD (set direct) and CD (clear direct) are used to set the outputs without a clock pulse at CP. The X in the table is a don't care state, the state is not important. **Without CP or D** inputs this latch may be used as a R-S latch where SD **is S and CD is R.**

CP	D	SD	CD	Q	$\overline{Q}$
1	0	0	0	0	1
1	1	0	0	1	0
0	X	0	0	NO CHANGE	NO CHANGE
X	X	0	1	0	1
X	X	1	0	1	0
X	X	1	1	1	1

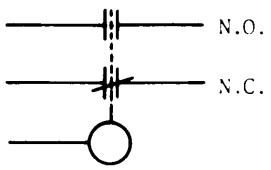
h.



BCD to decimal decoder. The number outputs correspond to the BCD inputs as shhown in the truth table.

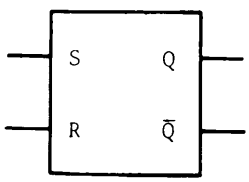
A3	A2	A1	A0	OUTPUT HIGH
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9

i.



Relay coil and contacts. Mounted on a plug in module. When energized the normally open (N. O.) path is closed and the normally closed (N. C.) path is opened.

j.

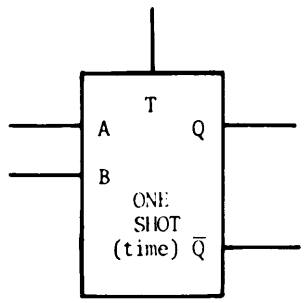


S-R Flip Flop. Output Q is a function of inputs S and R. Q^{n+1} refers to the state after input conditions specified have been supplied.

S	R	Q^{n+1}
0	0	Q^n
0	1	0
1	0	1
1	1	*

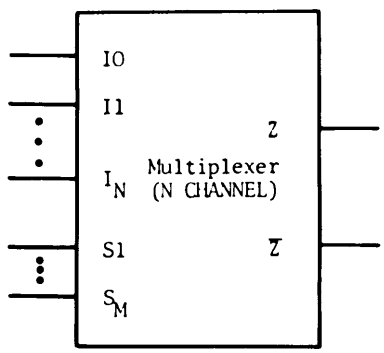
*Disallowed inputs

k.



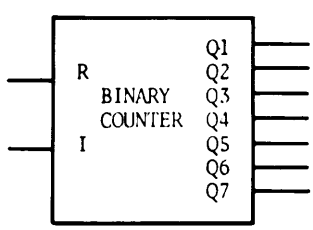
One shot. Outputs a high signal from Q ($\bar{Q}$ is compliment) on the leading edge of A or trailing edge of B. The Q output remains high for a specific time period during which the output at Q is not affected by any state changes of A or B. The time period is a function of the T input.

l.



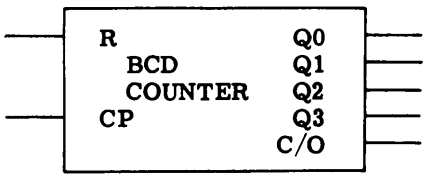
Multiplexer (general). A multiplexer is used to connect any one of N inputs to a single, Z, output ($\bar{Z}$ is the differential compliment). The input selected is a function of the binary combination of M (N - 2^M) selection inputs. (Ex. , 8 channel multiplexer requires 3 selection inputs: 2 channel multiplexer required 1 selection input.)

m.



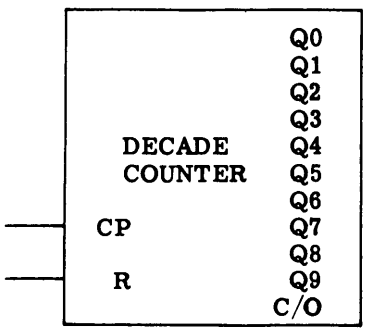
Binary Counter. Provides standard binary output incremented by 1 at each input pulse, I, with Q_1, least significant bit (LSB) to Q_7, most significant bit (MSB). Counter is reset to zero with a high signal on R.

n.



BCD counter. Produces a BCD output that is incremented by each input pulse of CP. The R input resets all outputs to zero. The C/O completes one cycle every 10 CP inputs.

o.



Decade counter. Produces a high output at one of ten output pins. The outputs, in numerical order, are incremented on each input pulse. The carry out (C/O) output completes one cycle every 10 input cycles, this provides an effective divide-by-ten output.

p. Color coding of test points. Regardless of TP number, all return test points are black.

Test Point	Color Code
TP1	Brown
TP2	Red
TP3	Orange
TP4	Yellow
TP5	Green
TP6	Blue
TP7	Violet
TP8	Gray
TP9	White

1-3. System Designation

Throughout this manual the designation XM65 and M65 are used interchangeably. The correct designation is M65. All items unique to a TSGMS equipped to support M65 with C-NITE shall be designated as such.

CHAPTER 2

TROUBLESHOOTING OF TSGMS

2-1. General.

This chapter contains the troubleshooting procedures for the TSGMS. The procedures are "drop in" procedures and are designed to be accessible when one or more self-test procedures fail to meet the required normal indications. Table 2-1 is a troubleshooting procedures entrance key which corresponds directly with self-test procedures in TM 9-4935-473-14-1. When a self-test fails to meet the required normal indication, this entrance key will direct the operator in a particular troubleshooting procedure. Table 2-2 is a multiple system failure troubleshooting procedures entrance key. This key is to be used when the TSGMS fails a number of systems and the failure is common to all failed systems (TSGMS suspect).

2-2. Trouble shooting of Control Monitor.

CAUTION

Ensure that the DMM is not used to read voltage in the Ohms mode, otherwise the DMM fuse on the DMM fuse, ensure that the RX1 scale on the ohms meter is used, otherwise the fuse will blow .

Ensure that after a probe or test lead is used for making a measurement, that it is touched to ground to remove any stray voltage; otherwise damage to components may result the next time it is used.

Ensure that ESD circuit cards are handled per paragraph 2-4 to prevent damage to circuit card components.

Exercise care when connecting and disconnecting cables to prevent damage to equipment due to electrostatic discharge and erroneous connections. Prior to connecting or disconnecting cables, be sure all power is turned off and that sources of electrostatic charge are not present at either end of the cables. Since the majority of the pins on each cable lead to components which are ESD, personnel must not touch, or otherwise allow static charges to reach the exposed pins of connector cables. A protective cap must be installed on any connector when cable is disconnected.

If the control monitor has failed one or more self-tests, refer to table 2-1 for the appropriate troubleshooting procedures. If the TSGMS has failed a number of systems with a common failure refer to table 2-2 for appropriate troubleshooting procedures. When performing tables 2-10 through 2-20 if any component in the Control Monitor is replaced, rerun Control Monitor Self-test procedures in TM 9-4935-473-14-1 and applicable system checkout procedure in TM 9-1425-473-34. The ellipsis (...), when used in the troubleshooting procedures, indicates an intentional blank. When removing MCU circuit card from the extender card, use card ejector to prevent spreading and bending of card connector pins.

When troubleshooting the Control Monitor, and the procedures call for replacement of a card or module, refer to Table 2-2.2 to determine if calibration is required after replacement of card or module. If calibration is required, tag TSGMS for calibration team. After replacement of any card or module, perform MCU self-test per TM 9-4935-473-14-1.

Before performing any troubleshooting procedure, verify that the MCU card switches are set as listed in table 2-2.3.

2-3. Troubleshooting of TSE M.

CAUTION

Ensure that after a probe or test lead is used for making a measurement, that it is touched to ground to remove any stray voltage: otherwise damage to components may result the next time it is used. When removing TSE M circuit card from the extender card, use card ejector to prevent spreading and bending of card connector pins.

Ensure that ESD circuit cards are handled per paragraph 2-4 to prevent damage to circuit card components.

Exercise care when connecting and disconnecting cables to prevent damage to equipment due to electrostatic discharge and erroneous connections. Prior to connecting or disconnecting cables, be sure all power is turned off and that sources of electrostatic charge are not present at either end of the cables. Since the majority of the pins on each cable lead to components which are ESD, personnel must not touch, or otherwise allow static charges to reach the exposed pins of connector cables. A protective cap must be installed on any connector when cable is disconnected.

Refer to table 2-1 for the appropriate troubleshooting procedures. The ellipsis (. . .), when used in the troubleshooting procedures, indicates an intentional blank.

When troubleshooting the TSE M, and the procedures call for replacement of a card or module, refer to table 2-2.2 to determine if calibration is required after replacement of a card or module. If calibration is required, tag TSGMS for calibration team. After replacement of any card or module, perform TSE M self-test per TM 9-4935-473-14-1.

Table 2-1. Troubleshooting Procedures Entrance Key

Failure		
Self-Test	Step	Troubleshooting Procedure
	◀ NOTE ▶	
	Before performing any troubleshooting procedure, verify that the MCU card switches are set as listed in Table 2-2.3. Refer to figure 2-1 for MCU card switch locations.	
Lamp test		
CONSTRAINT VALID, READY IN TEST, PASS, FAIL, and 3 PHASE	3	Table 2-3, step 1
T6, T7, Tll, T13, T14, T15, T17 and 2 PHASE	3	Table 2-3, step 6
BIT IN TEST, BIT PASS 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10	3	Table 2-3, Step 8
COUNTER/TIMER	3	Table 2-3, step 10
DMM	3	Table 2-3, step 12
ANGLE INDICATORS API 1 and API 2	3	Table 2-3, step 17
DMM	3	Table 2-4, step 2
	4	Table 2-4, step 14
	5	Table 2-4, step 14
	8	Table 2-4, step 14
TSGMS power	5	Table 2-5, step 1
	7	Table 2-5, step 2
	8	Table 2-5, step 3
	9	Table 2-5, step 4
	10	Table 2-5, step 5
	12	Table 2-5, step 6
	14	Table 2-5, step 7
COUNTER/TIMER	2	Table 2-6, step 1
	4	Table 2-6, step 6
	6	Table 2-6, step 16
AUTOMATIC TEST	3	Table 2-7, step 1
IR TARGET LOG H	7	Table 2-8, step 1
MCU Stimuli	7	Table 2-9, step 1
	11	Table 2-9, step 12
	16	Table 2-9, step 23
	17	Table 2-9, step 26
	20	Table 2-9, step 33
	21	Table 2-9, step 35.1
	26	Table 2-9, step 36

Table 2-1. Troubleshooting Procedures Entrance Key - Continued

Failure		
Self-Test	Step	Troubleshooting Procedure
MCU Stimuli - continued	28	Table 2-9, step 42
	31	Table 2-9, step 48
	35	Table 2-9, step 54
	41	Table 2-9, step 60
	43	Table 2-9, step 64
	46	Table 2-9, step 68
	47	Table 2-9, step 71
Thermal Patch self-test (C-NITE)	6	Table 2-9, step 82
TSEM self-test	5	Table 2-20, step 1
	7 and 9	Table 2-20, step 29
	12	Table 2-20, step 66
	14	Table 2-20, step 10

Table 2-2. Troubleshooting Control Monitor from System Checkout Failures

Item	Failure	Troubleshooting Action
	◀ NOTE ▶ Before performing any troubleshooting procedure, verify that the MCU card switches are set as listed in table 2-2.3. Refer to figure 2-1 for MCU card switch locations.	
1	Checkout M65 power failed	Perform table 2-10
2	Checkout programmer timing failed	Perform table 2-11
3	Checkout open loop commands failed	Perform table 2-12
4	Checkout MCA limits, CVAC, and G-bias failed	Perform table 2-13
5	Checkout sigma Z and rho computations failed	Replace Control Monitor
6	Checkout delta rho resolution failed	Replace A15 card; if malfunction persists, replace A16 card; if malfunction persists, replace Control Monitor
7	Checkout BIT failed	Perform table 2-14
8	Checkout self balance integrator drift failed	Replace Control Monitor
9	Checkout step response failed	Perform table 2-15
10	Checkout error detector gain program failed	Perform table 2-16
11	Checkout noise equivalent irradiance and angular noise failed	Perform table 2-17
12	Checkout IR boresight failed	Perform table 2-18
13	Checkout launch constraints failed	Perform table 2-19

Table 2-2.l. Test Equipment and Accessories for IRTA Adjustment

Item	Common Name	Description	Manufacturer, model, and/or part No.
1.	Oscilloscope	AN/USM-281A	6625-00-228-2201
2.	Multimeter	JF 8125A	6625-00-428-1496
3.	Counter	AN/USM-207	6625-00-911-6368
4.	Electrical Lead	24-in., single banana plug to single banana plug (black)	7907498
5.	Adapter	Banana jack to pin plug 215 (red)	7907517
6.	Adapter	Banana jack to pin plug 215 (black)	7907528
7.	Adapter	Banana jack to pin jack (red)	6625-00-678-0657
8.	Electrical Lead	12-in., single banana plug to single plug (red)	7907495
9.	Electrical Lead	12-in., single banana plug to single banana plug (black)	7907496

Table 2-2.2. TSGMS Cards/Modules Requiring Calibration After Replacement

Unit	Card/Module (Part No.)
Control Monitor	Circuit Card Assembly - A9 (11499107)
	Circuit Card Assembly - A13 (11499335)
	Digital Meter (11553729)
	Circuit Card Assembly - Attenuator (11499027)
	Circuit Card Assembly - A5 (11499103)
TSEM	Circuit Card Assembly - Al (11499226)
	Circuit Card Assembly - A2 (11499227)
	Circuit Card Assembly - A8 (11499233)
	Circuit Card Assembly - A7 (11499232)

Table 2-2.3. MCU Card Switches

Card	Switch	Switch Position	Use
A10	Z2S1	ON	Pass fail logic circuits - Required for normal operation.
	Z2S2-Z2S4	ON	Not connected.
A11	Z1S4	ON	Comparator Strobe circuits - Required for normal operation,
	Z1S1-Z1S3	ON	Not connected.
	S1 (spring loaded)	Normally closed	Troubleshooting aid.
A12	ZlSl, Z1S2	OFF	Troubleshooting aid.
	Z1S3, Z1S4	OFF	Not connected.
A14	S1 (spring loaded)	Normally Closed	Troubleshooting aid.
A20	S1-2, S1-3,	OFF	Troubleshooting aid.
	S1-4	OFF	Troubleshooting aid.
	S1-1	OFF	Not connected.
A21	Z5S4, Z5S1	OFF	Troubleshooting aid.
	Z5S2, Z5S3	OFF	Not connected.

◄ NOTE ►

Z1, Z2, and Z5 are multiswitches containing four segments each. The segments are identified by S1, S2, S3, or S4.

Refer to figure 2-1 for MCU card switch locations.

2-4. Electrostatic Sensitive Device Handling.

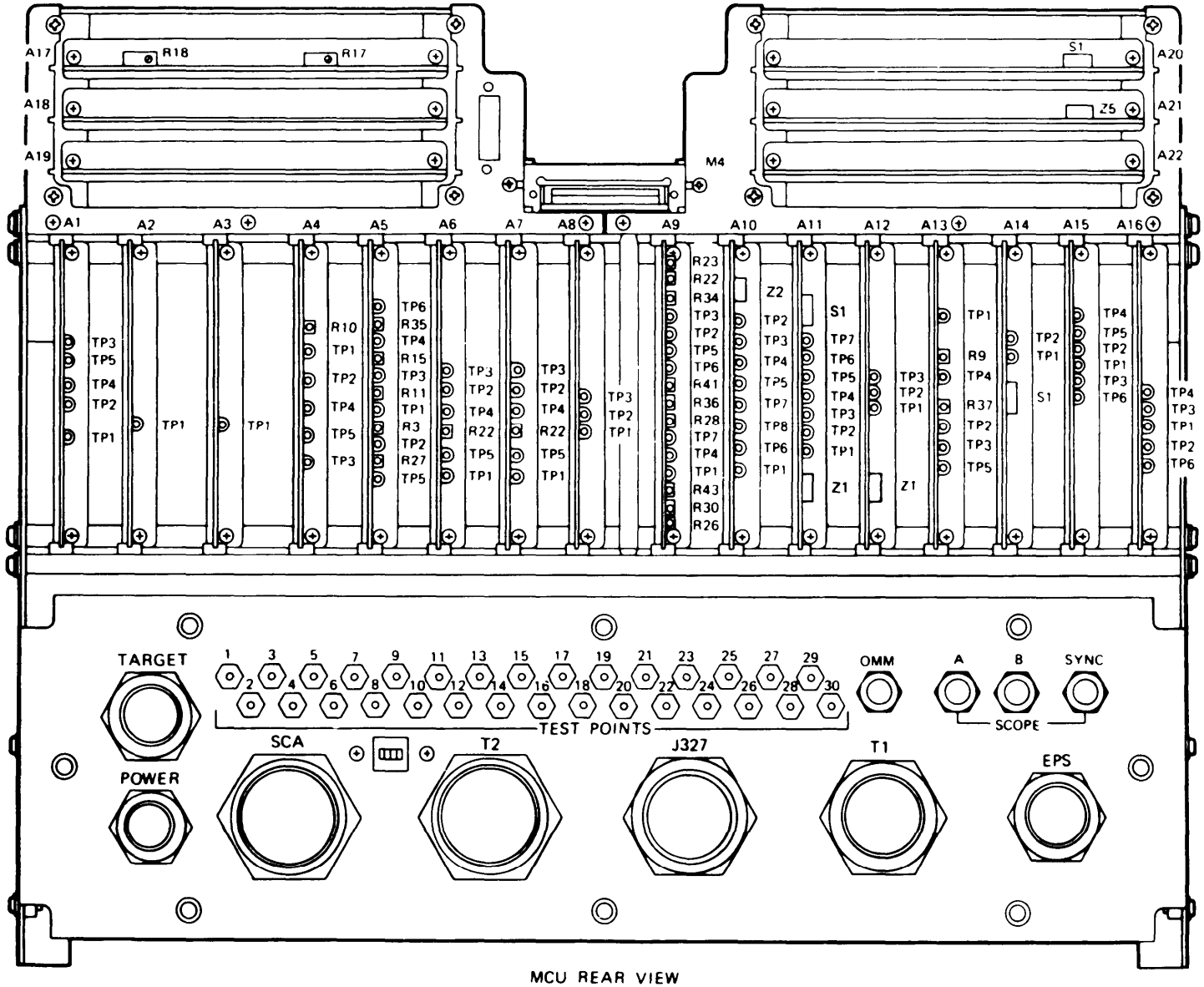
CAUTION

Low relative humidity (less than 30 percent) greatly increases the chance of damage to electrostatic sensitive devices due to discharge.

Before handling circuit cards the following precautions shall be taken: (1) Working surface shall be of electrostatic-free material and at ground potential; (2) All tools and equipment used in repair shall be at the same potential as the working surface; (3) Components, devices and circuit cards shall be at the same potential as work surface; (4) Personnel shall wear wrist strap, made of electrostatic-free material, which shall be electrically connected to working surface; (5) Avoid touching pins of integrated circuits with fingers; (6) When wearing long sleeved clothing, personnel shall cover sleeves from wrist to elbow with electrostatic-free material or remove that article of clothing or roll up the sleeves past the elbows thereby removing from close proximity any static carrying potential hazard.

Upon removing a circuit card, the circuit card should be placed immediately into a static shielding bag prior to being set on any surface. This will reduce the probability of inducing damage to other electrostatic sensitive components on the circuit card. If there is any delay in moving the repaired circuit card from the static-free work area to the LRU, the circuit card must be placed in a static shielding bag before it is moved away from static-free work area.

Field personnel should utilize a grounded floor mat in addition to the above mentioned grounded work surface. This will act as an added precaution against peripheral personnel such as supervisors or personnel not educated in the proper handling of electrostatic sensitive components. Accordingly it will keep the working field personnel from accidentally incurring further damage to other electrostatic sensitive components in the event they should happen to forget to reattach the grounded wrist strap after returning to the static-free work station from some electrostatically unstable or unsafe area.



MCU REAR VIEW
(REAR PANEL REMOVED)

Figure 2-1. MCU Circuit Card Switches and Test Points Location

Table 2-3. Lamp Test Troubleshooting Procedures

Step	UNIT group	Item	Action/indication	Yes	No
	◀NOTE➤ 1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel, except the DPM which is located in the back. 2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies. 3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. 4. Rerun lamp self-test procedure after replacing any component to verify that the fault is corrected. 5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.				
1	Control Monitor				
	Power	LAMP TEST	Press and hold		
	. . .	All indicators	Lit	. . .	Replace defective indicator lamp; if malfunction persists, go to step 2
2	Power	Power switch	OFF		
		Back Panel	Remove		
		A10 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al0 card	Pins 28, 25, 26, 22, 20, 21 (HI), and 27 (RTN)	Monitor		
	External DMM	Display	+25.0 to +28.5 V for each pin	Go to step 3	Replace Control Monitor

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Control Monitor				
	A10 card	Pin 31 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO	Go to step 4	Replace Control Monitor
4	Control Monitor				
	Power	LAMP TEST	Press and hold	. . .	. . .
	External DMM	Display	HI	Replace A10 card	Go to step 5

◀NOTE▶

It may be necessary to remove control monitor from case, Refer to TM 9-4935-473-14-1.

5	Control Monitor				
	Power conversion assembly	TP11 (HI) and TP10 (RTN)	Monitor		
	External DMM	Display	+4.95 to +5.05 V	Replace Control Monitor	Replace power conversion assembly, rerun Control Monitor self-test procedures and tag Control Monitor for calibration team; if malfunction persists, replace Control Monitor
6	Control Monitor				
	Power	LAMP TEST	Press and hold		
	. . .	All indicators	Lit	Go to step 7	Replace defective indicator lamp; if malfunction

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
(cont)	. . .				persists. replace A16 card; if malfunction persists, replace Control Monitor
7	Power	LAMP TEST	Release	. . .	. . .
8	Control Monitor				
	Power	LAMP TEST	Press and hold		
	. . .	All indicators	Lit	Go to step 9	Replace defective indicator lamp; if malfunction persists, replace A22 card; if malfunction persists, replace Control Monitor
9	Power	LAMP TEST	Release	. . .	. . .
10	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A18 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
		LAMP TEST	Press and hold		
	A18 card	Pins 13, 4, 5, 6, 9, 8, (HI), and 24 (RTN)	Monitor		

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
(cont)	External DMM	Display	HI ---pin 13 LO---pin 4 LO---pin 5 LO ---pin 6 LO ---pin 9 LO ---pin 8	Go to step 11 and replace COUNTER/ TIMER display; if malfunction persists, replace Control Monitor	Replace A18 card; if malfunction persists, replace Control Monitor
11	Control Monitor				
	Power	LAMP TEST	Release	. . .	. . .
12	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A19 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A19 card	Pins 40 (HI) and 1 (RTN)	Monitor		
	External DMM	Display	HI	Go to step 13	Replace power conversion assembly, rerun Control Monitor self test procedures, and tag Control Monitor for calibration team; if malfunction persists, replace Control Monitor

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Act ion/indication	Yes	No
13	Control Monitor				
	A19 card	Pins 6 (HI) and 1 (RTN)	Monitor		
	Power	LAMP TEST	Press and hold		
	External DMM	Display	LO	Go to step 14	Replace A19 card; if malfunction persists, replace Control Monitor
14	Control Monitor				
	Power	LAMP TEST	Release		
		LAMP TEST	Press and hold		
	A19 card	Pins 44, 3 (HI), and 1 (RTN)	Monitor		
	External DMM	Display	LO --- pin 44 LO --- pin 3	Go to step 15	Replace A17 card; if malfunction persists, replace Control Monitor; go to step 15
15	Control Monitor				
	Power	LAMP TEST	Release		
		LAMP TEST	Press and hold		

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
(cont)	A19 card	Pins 20, 15, 14, 9, 5, 8, 7 (HI), and 1 (RTN)	Monitor		
	External DMM	Display	HI ---pin 14 LO--- pin 9 HI --- pin 5 HI --- pin 8 HI --- pin 7 HI (when DPM sign is +) --- pin 20 LO (when DPM sign is +) ---pin 15	Go to step 16 and replace DMM display; if malfunction persists, replace Control Monitor	Go to step 16 and replace A19 card; if malfunction persists, replace Control Monitor
16	Control Monitor				
	Power	LAMP TEST	Release	. . .	. . .
17	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
		LAMP TEST	Press and hold		
	A1 card	Pins 5, 4, 2 (HI), and 18 (RTN)	Monitor		

Table 2-3. Lamp Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
17 (cont)	External DMM	Display	HI --- pin 5 HI --- pin 4 LO --- pin 2	Go to step 18 and replace faulty API display; if malfunction persists, replace Control Monitor	Go to step 18 and replace Al card; if malfunction persists, replace Control Monitor
18	Control Monitor Power	LAMP TEST	Release	. . .	. . .

Table 2-4. DMM Self-Test Troubleshooting Procedures

Step	UNIT group	Item	Action/indication	Yes	No
			◄NOTE►		
			1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel, except the DPM which is located in the back.		
			2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.		
			3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V.		
			4. Rerun DMM self-test procedure after replacing any component to verify that the fault is corrected.		
			5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.		
1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	. . .	DPM display	Operates	Go to step 2	Go to step 3
2	. . .	DPM display	+1.494 to +1.506 V	Go to step 9	Go to step 4
3	Power conversion assembly	TP3, TP1 (HI), and TP2 (RTN)	Monitor		
	External DMM	Display	-11.8 to 12.2 V---TP3 +4.95 to +5.05 V---TP1	Replace Control Monitor	Replace power conversion assembly, rerun Control Monitor self-test procedures, and tag Control Monitor for calibration team; if

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3 (cont)	External DMM				malfunction persists, replace Control Monitor

◀NOTE▶

It may be necessary to remove DVM attenuator assembly from control monitor. Refer to TM 9-4935-473-14-1.

4	Control Monitor				
	DVM attenuator assembly and A5 card	E15 (HI) and E13 (RTN) TP1 (HI) and TP5 (RTN)	Monitor and record		
	External DMM	Display	Greater than nominal 0 V at each point monitored	Go to step 6	Go to step 5
5	Control Monitor				
	Power	Power switch	OFF		
	. . .	A5 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A5 card		Monitor		
	External DMM	Display	+18.0 to +19.0 V--- pin 17 -18.0 to -19.0 V--- pin 19	Go to step 6	Replace power conversion assembly, rerun Control Monitor self-test procedures, and tag Control Monitor for calibration team; if malfunction persists, replace Control Monitor
6	. . .	. . .	External DMM indications in step 4 are equal	Go to step 7	Go to step 8
7	Control Monitor				
	A5 card	R3	Adjust		

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
7 (cont)	DPM	Display	+1.494 to 1.506 V	Rerun Control Monitor self-test procedures and tag Control Monitor for calibration team	Replace A5 card and repeat step 7; if malfunction persists, replace Control Monitor
8	DVM attenuator assembly	R6	Adjust		
	DPM	Display	+1.494 to +1.506 V	Go to step 30	Replace Control Monitor
9	Power	Power switch	OFF		
	. . .	A19 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	Control Monitor				
	A19 card	Pins 44, 3 (HI), and 1 (RTN)	Monitor		
	External DMM	Display	LO---pin 44 LO---pin 3	Go to step 10	Go to step 11
10	Control Monitor				
	A19 card	Pins 10, 4 (HI), and 1 (RTN)	Monitor		

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
10 (cont)	External DMM	Display	HI ---------- pin 10 +4 (approx) --- pin 4	Replace A19 card; if malfunction persists, replace DMM display; if malfunction persists, replace Control Monitor	Replace Control Monitor
11	Control Monitor				
	Power	Power switch	OFF		
	. . .	A19 card	Reinstall in original position		
		A17 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A17 card	Pins 45, 43 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 45 LO ---pin 43	Replace Control Monitor	Replace Control Monitor
12	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	DMM	MODE	S/N		

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
12 (cont)		Display	First digit blank	Replace A17 card; if malfunction persists, replace Control Monitor	Replace A19 card; if malfunction persists, replace DMM display; if malfunction persists, replace Control Monitor
13	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	DMM	MODE	S/N		
		Display	First digit blank	Replace A17 card; if malfunction persists, replace Control Monitor	Replace A19 card; if malfunction persists, replace DMM display; if malfunction persists, replace Control Monitor
14	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	. . .	DPM display	Between 1.495 and 1.505 V (ignore polarity)	Replace A19 card; if malfunction persists, replace Control Monitor	Go to step 15

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
15	Scope	VOLTS/DIV	0.5		
		TIME/DIV	2 MSEC		
	Control Monitor				
	DVM attenuator assembly	El (HI) and E13 (RTN)	Monitor		
	Scope	Display	1.5 Vp-p (approx) square wave	Go to step 30	Go to step 16
16	Control Monitor				
	Power	Power switch	OFF		
	. . .	A5 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A5 card	Pins 33 (HI) and 12 (RTN)	Monitor		
	Scope	Display	1.5 Vp-p (approx) square wave	Replace Control Monitor	Go to step 17
17	. . .	Display	Any square wave	Go to step 23	Replace A5 card and go to step 18
18	Control Monitor				
	A5 card	TP3 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between +1.497 and +1.503 V	Go to step 20	Go to step 19
19	Control Monitor				
	A5 card	R15	Adjust		
	External DMM	Display	+1.500 V	Go to step 20	Replace A5 card and go to step 21
20	Control Monitor				
	A9 card	R28	Adjust		
	External DMM	Display	Between +1.495 and +1.505 V	. .	Replace A5 card and go to step 21

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
21	Control Monitor A5 card External DMM	TP6 (HI) and TP5 (RTN) Display	Monitor Between 0.33 and 0.37 Vac	Go to step 23	Go to step 22
22	Control Monitor A5 card External DMM	R35 Display	Adjust 0.350 Vac	Go to step 23	Replace A5 card and go to step 18
23	Control Monitor A5 card External DMM	TP1 (HI) and TP5 (RTN) Display	Monitor Between +1.4995 and +1.5005 V	Go to step 25	Go to step 24
24	Control Monitor A5 card External DMM	R3 Display	Adjust +1.500 V	Go to step 25	Replace A5 card and go to step 18
25	Control Monitor A5 card External DMM	TP3 (HI) and TP5 (RTN) Display	Monitor Between +1.495 and +1.505 V	Go to step 27	Go to step 26
26	Control Monitor A5 card External DMM	R15 Display	Adjust +1.500 V	Go to step 27	Replace A5 card and go to step 18

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27	Control Monitor				
	A5 card	TP2 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between -1.4995 and -1.5005 V	Go to step 29	Go to step 28
28	Control Monitor				
	A5 card	R11	Adjust		
	External DMM	Display	-1.500 V	Go to step 29	Replace A5 card and go to step 18
29	. . .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .
30	Control Monitor				
	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	DMM	Display	0.0000 when test leads are shorted	Go to step 32	Go to step 31
31	DVM attenuator assembly	R6	Adjust		
	DMM	Display	0.0000 when test leads are shorted	Go to step 32	Replace Control Monitor
32	DMM	MODE	DC FILTER		
		Display	0.0000 when test leads are shorted	Go to step 34	Go to step 33

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
33	DVM attenuator assembly	R9	Adjust		
	DMM	Display	0.0000 when test leads are shorted	Go to step 34	Replace Control Monitor
34	DMM	MODE	RMS		
		VOLTS/OHMS	2K/2V		
	• • •	DMM test leads	Jumper		
		Jumpered test leads	Connect to TJ30		
	Power	Power switch	OFF		
	. . .	A9 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON	Go to step 35	. . .
35	Control Monitor				
	A9 card	TP4 (HI) and TP1 (RTN)	Monitor		
		R26	Adjust		
	External DMM	Display	-0.001 to +0.001 V	Go to step 36	Replace A9 card and repeat step 35
36	Control Monitor				
	A9 card	TP4 and TP1	Jumper		
	. . .	DVM attenuator assembly E16 (HI) and A9 card TP1 (RTN)	Monitor		
	A9 card	R30	Adjust		
	External DMM	Display	-0.001 to +0.001 V	Go to step 38	Replace A9 card and go to step 35

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
37	Deleted				
38	Control Monitor				
	Power	Power switch	OFF		
	. . .	External DMM	Disconnect		
	DMM	Display	Remove from front panel		
	Power	Power switch	PWR ON		
	DVM attenuator assembly	R14	Adjust		
	. . .	DMM display	-0.001 to +0.001 V	Go to step 39	Replace Control Monitor
39	Power	Power switch	OFF		

◄NOTE►

Take care to align DMM display when installing it on the front panel.

	. . .	DMM display	Install on front panel		
	Power	Power switch	PWR ON		
	A9 card	TP4 and TP1	Remove jumper		
		R26	Adjust		
	DMM	Display	-0.001 to +0. 001 V	Go to step 40	Replace A9 card and go to step 35
40	. . .	TJ30	Remove test leads and disconnect jumper		
	DMM	MODE	OHMS		
	. . .	Test leads	Connect to resistance standard		
	Resistance standard	Output controls	Set to 1.500K ohms		
	Control Monitor				
	DMM	Display	1.500	Go to step 42	Go to step 40.1

Table 2-4. DMM Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
40.1	Control Monitor Rear panel	DMM Fuse	Check fuse for open	Replace fuse	Go to step 41
41	. . . Control Monitor DVM attenuator assembly DMM	Display R2 Display	1.500K ohms Adjust 1.500	 Go to step 42	 Replace Control Monitor
42	. . .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .

Table 2-5. Power Test Troubleshooting Procedures

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to **TM 9-4935-473-14-1** repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. Rerun power test procedure after replacing any component to verify that the fault is corrected.
4. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.
5. It is necessary to remove Control Monitor from case. Refer to TM 9-4935-473-14-1.

1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	Power conversion assembly	TP5 (HI) and TP7 (RTN)	Monitor		
	External DMM	Display	+59 to 61 V	Replace Control Monitor	Replace power conversion assembly and go to step 9
2	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		

Table 2-5. Power Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
2 (cont)	Power conversion assembly	TP8 (HI) and TPl0 (RTN)	Monitor		
	External DMM	Display	+18. 1 to +18.9 V	Replace Control Monitor	Replace power conversion assembly and go to step 9
3	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al0 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al0 card	Pin 23 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	+9.0 to +11.0 V	Replace Control Monitor	Replace Al0 card; if malfunction persists, replace Control Monitor
4	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	Power conversion assembly	TP11 (HI) and TPl0 (RTN)	Monitor		
	External DMM	Display	+4.95 to +5.05 V	Replace Control Monitor	Replace power conversion assembly and go to step 9
5	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		

Table 2-5. Power Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
5 (cont)	Power conversion assembly	TP9 (HI) and TPl0 (RTN)	Monitor		
	External DMM	Display	-18.1 to -18.9 V	Replace Control Monitor	Replace power conversion assembly and go to step 9
6	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	Power	Power switch	PWR ON		
	Power conversion assembly	TP6 (HI) and TP7 (RTN)	Monitor		
	External DMM	Display	-59 to -61 V	Replace Control Monitor	Replace power conversion assembly and go to step 9
7	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al card	TP3 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	-9.5 to -10.5 V	Replace Control Monitor	Go to step 8
8	Control Monitor				
	Al card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	+1.497 to +1.503 V	Replace Al card	Replace A5 card and go to step 9; if malfunction persists, replace Control Monitor

Table 2-5. Power Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
9	Control Monitor A5 card External DMM	TP6 (HI) and TP5 (RTN) Display	Monitor Between 0.33 and 0.37 Vac	Go to step 11	Go to step 10
10	Control Monitor A5 card External DMM	R35 Display	Adjust 0.350 Vac	Go to step 11	Replace A5 card and go to step 9
11	Control Monitor A5 card External DMM	TP1 (HI) and TP5 (RTN) Display	Monitor Between +1.497 and +1.503 V	Go to step 13	Go to step 12
12	Control Monitor A5 card External DMM	R3 Display	Adjust 1.500 V	Go to step 13	Replace A5 card and go to step 9
13	Control Monitor A5 card External DMM	TP3 (HI) and TP5 (RTN) Display	Monitor Between +1.497 and +1.503 V	Go to step 15	Go to step 14
14	Control Monitor A5 card External DMM	R15 Display	Adjust +1.500 V	Go to step 15	Replace A5 card and go to step 9

Table 2-5. Power Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
15	Control Monitor A5 card External DMM	TP2 (HI) and TP5 (RTN) Display	Monitor Between -1.497 and -1.503 V	Go to step 17	Go to step 16
16	Control Monitor A5 card External DMM	R11 Display	Adjust -1.500 V	Go to step 17	Replace A5 card and go to step 9
17	. . .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .

Table 2-6. Counter/Timer Self-Test Troubleshooting Procedures

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to **TM 9-4935-473-14-1** repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic **HI** is defined as a voltage level of **4.85 V ± 0.30 V.** A logic **LO** is defined as a voltage level of **0.00 V ± 0.30 V.**
4. Rerun counter/timer self-test procedure after replacing any component to verify that the fault is corrected.
5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.

Step	UNIT group	Item	Action/indication	Yes	No
1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A15 card	Extend using extender card (11499061)		
	Scope	VOLTS/DIV	2		
		TIME/DIV	1 MSEC		
	Control Monitor				
	Power	Power switch	PWR ON		
	A15 card	Pins 30 (HI) and 18 (RTN)	Monitor		
	Scope	Display	1 kHz square wave	Go to step 2	Replace A14 card; if malfunction persists, replace Control Monitor
2	Control Monitor				
	A15 card	Pins 7 (HI) and 18 (RTN)	Monitor		

Table 2-6. Counter/Timer Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
2 (cont)	Scope	Display	1 kHz square wave	Go to step 3	Replace A15 card; if malfunction persists, replace Control Monitor
3	. . .	TIME/DIV	1 SEC		
	Control Monitor				
	A15 card	Pins 9 (HI) and 18 (RTN)	Monitor		
	Scope	Display	+2 V with LO pulses at 1 second intervals	Go to step 4	Replace A14 card; if malfunction persists, replace Control Monitor
4	Control Monitor				
	A15 card	Pins 1 (HI) and 18 (RTN)	Monitor		
	Scope	Display	+2 V with LO pulses at 1 second intervals	Go to step 5	Replace A15 card; if malfunction persists, replace Control Monitor
5	Control Monitor				
	A15 card	Pins 5, 4 (HI), and 18 (RTN)	Monitor		
	Scope	Display	One positive pulse every second at pins 5 and 4	Replace A18 card; if malfunction persists, replace COUNTER/ TIMER display; if malfunction persists, replace Control Monitor	Replace A15 card; if malfunction persists, replace Control Monitor

Table 2-6. Counter/Timer Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A15 card	Extend using extender card (11499061)		
	Scope	VOLTS/DIV	2		
		TIME/DIV	5 MSEC		
	Control Monitor				
	Power	Power switch	PWR ON		
	A15 card	Pins 35 (HI) and 18 (RTN)	Monitor		
	Scope	Display	35 Hz signal	Replace A15 card; if malfunction persists, replace Control Monitor	Replace A5 card and go to step 7; if malfunction persists, replace Control Monitor
7	Control Monitor				
	A5 card	TP6 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between 0.33 and 0.37 Vac	Go to step 9	Go to step 8
8	Control Monitor				
	A5 card	R35	Adjust		
	External DMM	Display	0.350 Vac	Go to step 9	Replace A5 card and go to step 7
9	Control Monitor				
	A5 card	TP1 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between +1. 497 and +1.503 v	Go to step 11	Go to step 10

Table 2-6. Counter/Timer Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
10	Control Monitor				
	A5 card	R3	Adjust		
	External DMM	Display	+1.500 V	Go to step 11	Replace A5 card and go to step 7
11	Control Monitor				
	A5 card	TP3 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between +1.497 and +1.503 V	Go to step 13	Go to step 12
12	Control Monitor				
	A5 card	R15	Adjust		
	External DMM	Display	+1.500 V	Go to step 13	Replace A5 card and go to step 7
13	Control Monitor				
	A5 card	TP2 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between -1.497 and -1.503 V	Go to step 15	Go to step 14
14	Control Monitor				
	A5 card	R11	Adjust		
	External DMM	Display	-1.500 V	Go to step 15	Replace A5 card and go to step 7
15	. . .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .
16	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A4 card	Extend using extender card (11499061)		
	Scope	VOLTS/DIV	5		

Table 2-6. Counter/Timer Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16 (cont)	Control Monitor	TIME/DIV	0.5 MSEC		
	Power	Power switch	PWR ON		
	A4 card	Pins 11 (HI) and 18 (RTN)	Monitor		
	Scope	Display	400 Hz sine wave	Replace A15 card; if malfunction persists, replace Control Monitor	Replace A4 card and go to step 17; if malfunction persists, Control Monitor
17	Control Monitor				
	A4 card	Pins 11 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	Between 9.9 and 10.1 Vrms	Malfunction is corrected	Go to step 18
18	Control Monitor				
	A4 card	R10	Adjust		
	External DMM	Display	Between 9.9 and 10.1 Vrms	Malfunction is corrected	Replace A4 card and go to step 17

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures

Step	UNIT group	Item	Action/indication	Yes	No
			◄NOTE►		
			1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.		
			2. Refer to **TM 9-4935-473-14-1** repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.		
			3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V.		
			4. Rerun MCU AUTO self-test procedure after replacing any component to verify that the fault is corrected.		
			5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.		
1	Control Monitor	Power switch	OFF		
	. . .	Back panel	Remove		
		Al0 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Scope	VOLTS/DIV	5		
		TIME/DIV	5 MSEC		
	Al0 card	Pin 9 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (self-test is selected)	Go to step 2	Replace A21 card; if malfunction persists, replace Control Monitor
2	Control Monitor				
	Al0 card	TP2 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (mode switch in AUTO)	Go to step 3	Replace A21 card; if malfunction persists, replace Control Monitor

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Control Monitor				
	A10 card	Pin 15 (HI) and TP1 (RTN)	Monitor		
			◄NOTE►		
			The indications in this step will occur approximately 10 and 20 seconds after setting the mode switch to AUTO.		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	Momentary HI after 10 seconds and HI after 20 seconds (indicates comparator pulse occurs)	Go to step 4	Go to step 7
4	Control Monitor				
	A10 card	Pin 13 (HI) and TP1 (RTN)	Monitor		
			◄NOTE►		
			The indication in this step will occur approximately 10 seconds after setting the mode switch to AUTO.		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	One positive spike after 10 seconds (indicates switch pulse occurs)	Go to step 5	Go to step 7
5	Control Monitor				
	A10 card	Pin 8 (HI) and TP1 (RTN)	Monitor		
			◄NOTE►		
			The indications in this step will occur approximately 0.6, 1, 3, 6, 12, and 18 seconds after setting the mode switch to AUTO.		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
5 (cont)	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	Momentary: HI after 0.6 second HI after 1 second HI after 3 seconds HI after 6 seconds HI after 12 seconds HI after 18 seconds (time code signal occurs)	Go to step 6	Go to step 12
6	Control Monitor				
	A10 card	Pin 30 (HI) and TP1 (RTN)	Monitor		

◄NOTE►

The indications in this step will occur approximately 3 and 12 seconds after setting the mode switch to AUTO.

	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	Momentary: LO after 3 seconds LO after 12 seconds (comparator output signal changes state)	Replace A10 card	Go to step 16
7	Control Monitor				
	Power	Power switch	OFF		
	. . .	A10 card	Reinstall in original position		
		All card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	All card	Pin 8 (HI) and TP1 (RTN)	Monitor		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
7 (cont)	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	HI prior to test, 100 Hz square wave during test, and HI at end of test (window comparator signal occurs)	Go to step 8	Go to step 13
8	Control Monitor				
	All card	Pin 9 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	RESET	Press		
	External DMM	Display	HI while RESET is pressed (reset signal occurs)	Go to step 9	Replace A21 card; if mal-function persists, replace Control Monitor
9	Control Monitor				
	All card	Pin 13 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	External DMM	Display	LO during entire sequence (CVAC is not selected)	Go to step 10	Replace A20 card: if mal - function persists, replace Control Monitor
10	Control Monitor				
	A11 card	Pin 34 (HI) and TP1 (RTN)	Monitor		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
(cont)	External DMM	Display	HI (+5 V switched is available for time code generator)	Go to step 11	Replace A20 card; if mal-function persists, replace Control Monitor
11	Control Monitor				
	All card	Pin 20 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	-12 V (-12 V switched is available for time code generator)	Replace All card	Replace A20 card; if rnal-function persists, replace Control Monitor
12	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al0 card	Reinstall in original position		
		All card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	All card	Pins 33, 32, 31 (HI), and TPl (RTN)	Monitor		
	External DMM	Display	HI --- pin 33 LO ---pin 32 HI ---pin 31	Replace All card; if mal-function persists, replace Control Monitor	Replace A20 card; if mal-function persists, replace Control Monitor
13	Control Monitor				
	Power	Power switch	OFF		
	. . .	All card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
13 (cont)	Power	Power switch	PWR ON		
	A14 card	Pin 32 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (AUTO is selected)	Go to step 14	Replace A21 card; if malfunction persists, replace Control Monitor
14	Control Monitor				
	AUTOMATIC TEST	Mode switch	MANUAL		
	External DMM	Display	LO (MANUAL is selected)	Go to step 15	Replace A21 card; if malfunction persists, replace Control Monitor
15	Control Monitor				
	A14 card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	RESET	Press and release		
		Mode switch	AUTO		
	External DMM	Display	LO for approximately 20 seconds, then HI (end-of-test signal occurs)	Replace A14 card; if malfunction persists, replace Control Monitor	Replace A10 card; if malfunction persists, replace Control Monitor
16	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al0 card	Reinstall in original position		
		All card	Extend using extender card (11499061)		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16 (cont)	Power	Power switch	PWR ON		
	All card	Pin 11 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	+10 V, then +3 V (approx) at first PASS indication, then +10 V at final PASS indication (upper limit)	Go to step 17	Go to step 20
17	Control Monitor				
	Al 1 card	Pin 7 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
		Mode switch	AUTO		
	Scope	Display	-10 V, then +3 V (approx) at first PASS indication, then +10 V at final PASS indication (lower limit)	Go to step 18	Go to step 20
18	Control Monitor				
	Al1 card	Pin 6 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	+3 V (approx) (analog signal)	Replace All card; if malfunction persists, replace Control Monitor	Go to step 19
19	Control Monitor				
	Power	Power switch	OFF		
	. . .	All card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
19 (Cont)	Power	Power switch	PWR ON		
	A13 card	Pins 14, 15, 12 (HI), and TP5 (RTN)	Monitor		
	External DMhl	Display	HI --- pin 14 HI --- pin 15 HI --- pin 12 (signal selection)	Replace A13 card and go to step 22; if mal-function persists, replace Control Monitor	Replace A20 card; if nlal-function persists, replace Control Monitor
20	Control Monitor				
	Power	Power switch	OFF		
	. . .	All card	Reinstall in original position		
		A12 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Pins 1, 2, 3, 4, 5 (HI), and TP1 (RTN)	Monitor		
	External DMM	Display	LO --- pin 1 LO --- pin 2 LO --- pin 3 LO --- pin 4 LO --- pin 5 (limit code)	Go to step 21	Replace A20 card; if nlal - function persists, replace Control Monitor
21	Control Monitor				
	A12 card	Pin 32 (HI) and TP1 (RTN)	Monitor		

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
21 (cont)	External DMM	Display	LO (Control Monitor is not reset)	Replace A12 card; if malfunction persists, replace All card; if malfunction persists, replace Control Monitor	Replace A21 card; if malfunction persists, replace Control Monitor
22	Control Monitor				
	Power	Power switch	OFF		
	. . .	A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	External DC power supply	Voltage control	Adjust		
		Display	0.0V		
		output	Connect to A13 card pins 28 (HI) and 32 (RTN)		
	Control Monitor				
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
		TEST SELECTOR 1	8		
		CHANNEL SELECTOR	P1		
	External DC power supply	Voltage control	Adjust		
	Control Monitor				
	DMM	Display	+5. 000 V	Go to step 23	Replace Control Monitor

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
23	AUTOMATIC TEST	TEST NUMBER	24		
	A13 card	TP4 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	+4.49 to +4. 51 V	Go to step 25	Go to step 24
24	Control Monitor				
	A13 card	R9	Adjust		
	External DMM	Display	+4.50 V	Go to step 25	Replace A13 card and go to step 23
25	External DC power supply	Voltage control	Adjust		
		Display	0.0 V		
		out put	Connect to A13 card pins 10 (HI) and 32 (RTN)		
	Control Monitor				
	A13 card	Pins 10 (HI) and 32 (RTN)	Monitor		
	External DC power supply	Voltage control	Adjust		
	External DMM	Display	+1.000 V	Go to step 26	Replace Control Monitor
26	Control Monitor				
	AUTOMATIC TEST	TEST NUMBER	25		
	A13 card	TP4 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	+0. 998 to +1. 002 V	Go to step 28	Go to step 27

Table 2-7. MCU AUTO Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27	Control Monitor A13 card External DMM	 R37 Display	 Adjust +1.000 V	 Go to step 28	 Replace A13 card and go to step 23
28	. .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .

Table 2-8. Log H Self-Test Troubleshooting Procedures

Step	UNIT group	Item	Action/indication	Yes	No
			◄NOTE►		
			1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.		
			2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.		
			3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V.		
			4. Rerun log H self-test procedure after replacing any component to verify that the fault is corrected.		
			5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.		
			6. Press and release RESET pushbutton switch each time PWR ON/OFF switch is set to PWR ON.		
			7. Perform continuity check on cable W2 to ensure cable is good prior to performing this table.		
1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al card	Pin 14 (HI) and TP1 (RTN)	Monitor		
	AUTOMATIC TEST	TEST NUMBEF	02		
	External DMM	Display	+7. 4 to +7. 6 V (target amplitude output)	Go to step 3	Go to step 2
2	Control Monitor				
	Al card	Pin 10 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (log H selected)	Replace Al card; if malfunction persists, replace Control Monitor	Replace A2 card; if malfunction persists, replace Control Monitor

Table 2-8. Log H Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al card	Reinstall in original position		
	. . .	A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	TARGET CONTROL	Target Selector	CTR		
	A14 card	Pin 10 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI	Go to step 5	Go to step 4
4	Control Monitor				
	A14 card	Pin 32 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (manual mode selected)	Replace A14 card; if malfunction persists, replace Control Monitor	Replace Control Monitor
5	Control Monitor				
	TARGET CONTROL	Target Selector	Set to LEFT		
	DMM	CHANNEL SELECTOR	LOG H		
		VOLTS/ OHMS	2K/2V		
		MODE	DC		
	TARGET CONTROL	TARGET	PWR ON		
	DMM	Display	Indicates between -0.964 and -1.076 v	Replace Control Monitor	Go to step 6

Table 2-8. Log H Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	IR Target Assembly				
	. . .	Case	Remove per TM 9-4935-473-14-1		
	. . .	. . .	Align IR Target assembly per table 2-21		
	Control Monitor				
	TARGET CONTROL	Target selector	Set to CTR		
	DMM	Display	Indicated between -0.964 to -1.076 V	Go to step 8	Go to step 7
7	IR Target Assembly				
	. . .	Circuit card	Remove and replace per TM 9-4935-473-14-1		
	. . .	. . .	Align IR Target assembly per table 2-21		
	Control Monitor				
	TARGET CONTROL	Target selector	Set to CTR		
	DMM	Display	Indicates between -0.964 and -1.076 v	Go to step 8	Replace Control Monitor
8	IR Target Assembly				
	. . .	Case	Install per TM 9-4935--473 -14-1		
	. . .	. . .	Maintenance complete	. . .	. . .

TAble 2-8. Log H Self-Test troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
	◄ NOTE ►				
	1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.				
	2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards. and defective subassemblies				
	3. A logic HI is defined as a voltage level of 4.85 V ± 0. 30 V. A logic LO is defined as a voltage level of 0. 00 V ± 0.30 V.				
	4. Rerun MCU stimuli self-test procedure after replacing any component 10 verify that the fault is corrected.				
	5. Ensure that power is off when removing or installing any card, subassembly, or component in the Control Monitor.				
	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A7 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A7 card	Pin 7 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between -36.0 and -40.0 V (AZ stick command out)	Replace Control Monitor	Go to step 2
2	Control Monitor				
	A7 card	Pins 34, 32 20, 35 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI ---pin 34 LO- -- pin 32 LO---pin 20 HI ---pin 35 (servo selection)	Go to step 4	Go to step 3

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI) , and 24 (RTN)	Monitor		
	External DMM	Display	HI---pin 26 LO---pin 27 LO---pin 28 LO---pin 29 HI ---pin 37 HI ---pin 38 LO---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
4	Control Monitor				
	A7 card	Pin 31 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (motion compensation not selected)	Go to step 6	Go to step 5
5	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Reinstall in original position		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 2 LO ---pin 3 LO---pin 4 LO- -- pin 5 HI---pin 18 HI---pin 19 LO---pin 20 LO----pin 1	Replace A20 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	Control Monitor				
	COUNTER TIMER	UNITS	SEC		
		FREQ TIME	3		
	ANGLE INDICATORS	API 1	GYRO ROLL		
	AUTOMATIC TEST	Mode switch	MANUAL		
		TEST NUMBER	12		
	◄ NOTE ► Before continuing, ensure that GYRO PITCH is adjusted to 0. 0 as indicated on API 2				
	GYRO	ROLL	Adjust		
	ANGLE INDICATORS	API 1 display	+ 50. 0	Go to step 7	Replace A3 card: if malfunc - tion per- sists, replace Control Monitor
7	AUTOMATIC TEST	RESET	Press and release		
		Mode switch	AUTO		
	GYR0	ROLL	Adjust		
	ANGLE INDICATORS	API 1 display	-50.0	Go to step 8	Replace A3 card; if malfunc - tion per- sists, replace Control Monitor
8	COUNTER/TIMER	Display	Starts counting when API 1 display indicates +45. 9 and stops counting when API 1 display indicates -45.0	Go to step 9	Replace A17 card: if malfunc - tion per- sists, replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
9	GYRO ANGLE INDICATORS	ROLL API 1 display	Adjust 0.0	 Go to step 10	 . . .
		◄NOTE►			
	Steps 10 and 11 are A7 card null adjustments.				
10	Control Monitor Power A7 card Power A7 card External DMM	 Power switch TP4 and TP1 TP5 (HI) and TP1 (RTN) Power switch R22 Display	 OFF Jumper Monitor PWR ON Adjust Between -0.001 and +0. 001 v	 Go to step 11	 Replace A7 card and repeat step 10
11	Control Monitor Power A7 card Power AUTOMATIC TEST DMM	 Power switch TP4 and TP1 Power switch TEST NUMBER Mode switch Display	 OFF Remove jumper PWR ON 13 MANUAL, then to AUTO Between -36.0 and -40.0 V	 Malfunction is corrected	 Replace A7 card and go to step, 10; if mal-function persists, replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
			◀NOTE▶ It may be necessary to change A6 card with the A7 card. Repeat test and if different malfunction, replace A6 card,		
12	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A6 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A6 card	Pin 7 (HI) and TPI (RTN)	Monitor		
	External DMM	Display	Between -36.0 and -40.0 V (EL stick command out)	Replace Control Monitor	Go to step 13
13	Control Monitor				
	A6 card	Pins 34, 32, 20, 35 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	HI ---pin 34 LO--- pin 32 LO- -- pin 20 HI ---pin 35 (servo selection)	Go to step 15	Go to step 14
14	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 26 LO--- pin 27 LO--- pin 28 LO- -- pin 29 HI ---pin 37 LO- -- pin 38 HI ---pin 39 LO ---pin 14	Replace A21 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
15	Control Monitor				
	A6 card	Pin 31 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (motion compensation not selected)	Go to step 17	Go to step 16
16	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Reinstall in original position		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 2 LO--- pin 3 LO- - -pin 4 LO- -- pin 5 HI ---pin 18 LO---pin 19 HI ---pin 20 LO- - -pin 1	Replace A20 card	Replace Control Monitor
17	Control Monitor				
	COUNTER/TIMER	UNITS	SEC		
		FREQ/TIME	4		
	ANGLE INDICATORS	API 2	GYRO PITCH		
	AUTOMATIC TEST	Mode switch	MANUAL		
		TEST NUMBER	15		

◄ NOTE ►

Before continuing, ensure that GYRO ROLL is adjusted to 0. 0 as indicated on API 1.

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
17 (Cont)	GYRO ANGLE INDICATORS	PITCH API 2 display	Adjust -28.0	Go to step 18	Replace A2 card; if malfunction persists, replace Control Monitor
18	AUTOMATIC TEST GYRO ANGLE INDICATORS	RESET Mode switch PITCH API 2 display	Press and release AUTO Adjust +28.0	Go to step 19	Replace A2 card; if malfunction persists, replace control monitor
19	COUNTER TIMER	Display	Starts counting when API 2 display indicates -25.9 and stops counting when API 2 display indicates +25. 0	Go to step 20	Replace A17 card: if malfunction persists. replace Control Monitor
20	GYRO ANGLE INDICATORS	PITCH API 2 display	Adjust 0.0	Go to step 21	. . .

◀NOTE▶

Steps 21 and 22 are A6 card null adjustments.

21	Control Monitor Power A6 card	 Power switch TP4 and TP1 TP5 (HI) and TP1 (RTN)	 OFF Jumper Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
21 (cont)	Power	Power switch	PWR ON		
	A6 card	R22	Adjust		
	External DMM	Display	Between -0.001 and +0. 001 V	Go to step	Replace A6 card and repeat step 21
22	Control Monitor				
	Power	Power switch	OFF		
	A6 card	TP4 and TP1	Remove jumper		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	DMM	Display	Between -36.0 and -40.01	Malfunction corrected	Replace A6 card and go to step 21; if malfunction persists, replace Control Monitor
23	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al card	Pin 28 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between +1. 48 and +1. 52 V (AZ torque buffered)	Replace Control Monitor	Go to step 24
24	Control Monitor				
	Al card	Pin 23 (HI), and TP1 (RTN)	Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
24 (cont)	External DMM	Display	HI (select delta rho)	Replace Al card; if may function per sists, replace Control Monitor	Go to step 25
25	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 26 HI---pin 27 LO---pin 28 LO--- pin 29 LO--- pin 37 LO--- pin 38 LO--- pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor
25.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1 card	Pin 25 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between +1.48 and +1.52 V (EL torque buffered)	Replace Control Monitor	Go to step 25.2
25.2	Control Monitor				
	A1 card	Pin 23 (HI), and TP1 (RTN)	Monitor		
	External DMM	Display	HI (select delta rho)	Replace Al card; if malfunc-tion per-sists, replace Control Monitor	Go to step 25.3

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
25.3	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 LO---pin 38 LO---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
26	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A 1 card	Pin 33 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between +4.95 and +5 .05 V (AZ VS1)	Replace	Go to step 27
27	Control Monitor				
	A1	Pin 22 (HI) and TP1 (RTN)	Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27 (Cont)	External DMM	Display	LO---pin 22 (AZ VSI short not selected)	Go to step 29	Go to step 28
28	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO---pin 2 HI ---pin 3 LO--- pin 4 LO---pin 5 LO---pin 18 LO---pin 19 LO---pin 20 LO- - -pin 1	Replace A20 card	Replace Control Monitor
29	Control Monitor				
	Al card	Pin 3 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (step response not selected)	Go to step 31	Go to step 30
30	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 26 HI ---pin 27 LO--- pin 28	Replace A21 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
30 (Cont)			LO--- pin 29 LO ---pin 37 LO--- pin 38 L O--- pin 39 LO---pin 14		
31	Control Monitor				
	A1 card	Pin 35 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (alternate target)	Replace Al card: if malfunction persists, replace Control Monitor	Go to step 32
32	Control Monitor				
	Power	Power switch	OFF		
	...	Al card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pins 13, 12, 14, 1 (HI), and TP1 (RTN)	Monitor		
	External DMM	Display	LO--- pin 13 LO--- pin 12 LO---pin 14 HI ---pin 1	Replace A14 card	Replace Control Monitor
33	Control Monitor				
	Power	Power switch	OFF		
	...	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1 card	Pin 24 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between +4. 95 and +5. 05 V (EL VSI)	Replace Control Monitor	Go to step 34

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
34	Control Monitor				
	Al card	Pin 21 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (EL VSI not selected)	Replace Al card; if malfunction persists, replace Control Monitor	Go to step 35
35	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11490064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN	Monitor		
	External DMM	Display	LO--- pin 2 HI ---pin 3 LO---pin 4 LO--- pin 5 LO---pin 18 LO--- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

STEP	UNIT group	Item	Action/indication	Yes	No
35.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1 card	Pin 33 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	Between +4. 95 and +5. 05V (AZ VS1)	Replace Control Monitor	Go to step 35.2
35.2	Control Monitor				
	Al card	Pin 22 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	LO (AZ VS 1 short not selected)	Replace Al card; if malfunction persists, replace Control Monitor	Go to step 36
36	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1 card	Pin 21 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	LO---pin 21 (EL VSI short not selected)	Go to step 38	Go to step 37

Table 2-9. MCU Stimuli Self- Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
37	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 2 HI ---pin 3 LO--- pin 4 LO--- pin 5 HI ---pin 18 HI ---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
38	Control Monitor				
	Al card	Pins 3, 23 (HI), and TP1 (RTN)	Monitor		
	External DMM	Display	LO- -- pin 3 (step response not selected) HI ---pin 23 (delta rho selected)	Go to step 40	Go to step 39
39	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
39 (cont)	External DMM	Display	LO--- pin 26 HI ---pin 27 LO--- pill 28 LO--- pin 29 HI ---pin 37 HI ---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
40	Control Monitor				
	Al card	Pin 35 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI (alternate target)	Replace Al card; if malfunction persists, replace Control Monitor	Go to Step 41

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
41	Control Monitor				
	Power	Power switch	OFF		
	. . .	A1 card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (end of test pulse)	Replace A14 card	Go to step 41.1
41.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A10 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A10 card	Pin 24 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI ($\overline{\text{AUTO}}$)	Replace Al0 card	Go to step 41.2
41.2	Control Monitor				
	Power	Power switch	OFF		
	. . .	A10 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pin 34 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	HI	Replace A21 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
42	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al card	Pin 22 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	LO--- pin 22 (AZ VSI short not selected)	Go to step 44	Go to step 43
43	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 2 HI ---pin 3 LO--- pin 4 LO--- pin 5 LO--- pin 18 LO--- pin 19 LO--- pin 20 HI ---pin 1	Replace A20 card	Replace Control Monitor
44	Control Monitor				
	Al card	Pins 3, 23 (HI), and 18 (RTN)	Monitor		
	External DMM	Display	LO--- pin 3 (step response not selected) HI ---pin 23 (delta rho selected)	Go to step 46	Go to step 45

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
45	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Reinstall unoriginal position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO ---pin 26 HI ---pin 27 LO ---pin 28 LO --- pin 29 LO ---pin 37 LO ---pin 38 LO ---pin 39 HI ---pin 14	Replace A21 card	Replace Control Monitor
46	Control Monitor				
	A1 card	Pin 35 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI (alternate target)	Replace Al card; if malfunction per - sists, replace Control Monitor	Go to step 47
47	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (end of test pulse)	Replace A14 card	Go to step 47.1

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
47.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	A 14 card	Reinstall in original position		
		A10 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A10 card	Pin 24 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI ($\overline{\text{AUTO}}$)	Replace Al0 card	Go to step 47.2
47.2	Control Monitor				
	Power	Power switch	OFF		
	. . .	A10 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pin 34 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	HI	Replace A21 card	Replace Control Monitor
48	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1 card	Pin 22 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	LO (AZ VS 1 short not selected)	Go to step 50	Go to step 49

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
49	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 2 HI ---pin 3 LO--- pin 4 LO--- pin 5 LO---pin 18 HI ---pin 19 LO--- pin 20 LO---pin 1	Replace A20 card	Replace Control Monitor
50	Control Monitor				
	Al card	Pins 3, 31 18 (RTN)	Monitor		
	External DMM	Display	HI ---pin 3 (step response selected) LO--- pin 31 (-5 V not selected)	Go to step 52	Go to step 51
51	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI ---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 HI ---pin 38 LO---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
52	Control Monitor				
	Al card	Pin 35 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI (alternate target)	Replace Al card; if malfunction persists, replace Control Monitor	Go to step 53
53	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (end of test pulse)	Replace A14 card	Go to step 53.1
53.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A10 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A10 card	Pin 24 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI ($\overline{\text{AUTO}}$)	Replace Al0 card	Go to step 53.1

Table 2-9. MCU Stimuli Self -Test Troubleshooting Procedures -Continued

Step	UNIT group	Item	Action/indication	Yes	No
53.2	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al0 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pin 34 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	HI	Replace A21 card	Replace Control Monitor
54	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	Al card	Pins 21 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	LO --- pin 21 (EL VSI short not selected)	Go to step 56	Go to step 55
55	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures -Continued

Step	UNIT group	Item	Action/indication	Yes	No
55 (cont)	External DMM	Display	HI --- pin 2 HI --- pin 3 LO --- pin 4 LO --- pin 5 HI --- pin 18 HI --- pin 19 LO --- pin 20 LO --- pin 1	Replace A20 card	Replace Control Monitor
56	Control Monitor				
	A1 card	Pins 3, 31 (HI), and TP1 (RTN)	Monitor		
	External DMM	Display	HI --- pin 3 (step response not selected) LO --- pin 31 (-5 V not selected)	Go to step 58	Go to step 57
57	Control Monitor				
	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	HI --- pin 26 HI --- pin 27 LO --- pin 28 LO --- pin 29 HI --- pin 37 HI --- pin 38 LO --- pin 39 LO --- pin 14	Replace A21 card	Replace Control Monitor
58	Control Monitor				
	A1 card	Pin 35 (HI) and 18 (RTN)	Monitor		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures -Continued

Step	UNIT group	Item	Action/indication	Yes	No
58 (cont)	External DMM	Display	HI (alternate target)	Replace Al card; if malfunction persists, replace Control Monitor	Go to step 59
59	Control Monitor				
	Power	Power switch	OFF		
	. . .	Al card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pin 26 (HI) and TP1 (RTN)	Monitor		
	External DMM	Display	HI (end of test pulse)	Replace A14 card	Go to step 59.1

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
59.1	Control Monitor				
	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A10 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A1O card	Pin 24 (HI) and 18 (RTN)	Monitor		
	External DMM	Display	HI (AUTO)	Replace Al0 card	Go to Step 59.2
59.2	Control Monitor				
	Power	Power switch	OFF		
	. . .	A10 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pin 34 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	HI	Replace A21 card	Replace Control Monitor
60	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A5 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A5 card	Pin 9 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between 0.33 and 0.37 Vrms (AZ in)	Replace Control Monitor	Go to step 61

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
61	Control Monitor				
	A5 card	Pin 4 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	HI (select AZ servo analyzer)	Go to step 63	Go to step 62
62	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI) and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 26 LO--- pin 27 HI ---pin 28 LO--- pin 29 LO--- pin 37 HI ---pin 38 LO--- pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor
63	Control Monitor				
	45 card	Pin 9 (HI) and TP5 (RTN)	Monitor using external DMM		
		R35	Adjust		
	External DMM	Display	0. 350 Vrms	Malfunction is corrected	Replace A5 card and go to step 73
64	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A5 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
64 (Cont)	Control Monitor				
	A5 card	Pin 8 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between 0. 33 and 0.37 Vrms (EL in)	Replace Control Monitor	Go to step 65
65	Control Monitor				
	A5 card	Pin 2 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	HI (Select EL servo analyzer)	Go to step 67	Go to step 66
66	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO---pin 26 LO---pin 27 HI ---pin 28 LO---pin 29 HI ---pin 37 HI ---pin 38 LO---pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor
67	Control Monitor				
	A5 card	Pin 8 (HI) and TP5 (RTN)	Monitor using external DMM		
		R35	Adjust		
	External DMM	Display	0. 350 Vrms	Malfunction is corrected	Replace A5 card and go to step 73

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
68	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A4 card	Pin 25 (HI) and TP3 (RTN)	Monitor		
	External DMM	Display	Between + 1.31 and +1.39 V	Replace Control Monitor	Go to step 69
69	Control Monitor				
	A4 card	Pins 15, 28, 29, 30 (HI) and TP3 (RTN)	Monitor		
	External DMM	Display	LO---pin 15 (0. 8 V BIT test not selected) HI ---pin 28 LO---pin 29 LO---pin 30 (BIT COMP NO. 1 selection)	Replace A4 card; if malfunction persists, replace Control Monitor	Go to step 70
70	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO---pin 26 LO--- pin 27 HI ---pin 28 LO---pin 29 LO---pin 37 LO---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
71	Control Monitor				
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A4 card	Pins 15, 28, 29, 30 (HI) and TP3 (RTN)	Monitor		
	External DMM	Display	HI ---pin 15 (0. 8 V BIT test selected HI ---pin 28 LO---pin 29 LO---pin 30 (BIT COMP NO. 1 selection)	Replace A4 card; if malfunc - tion per- sists, replace- Control Monitor	Go to step 72
72	Control Monitor				
	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	External DMM	Display	LO--- pin 26 LO---pin 27 HI ---pin 28 LO---pin 29 HI ---pin 37 LO---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
73	Control Monitor				
	A5	TP6 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between 0. 33 and 0. 37 Vac	Go to step 75	Go to step 74

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/indication	Yes	No
74	Control Monitor				
	A5 card	R35	Adjust		
	External DMM	Display	0. 350 Vac	Go to step 75	Replace A5 card and go to step 73
75	Control Monitor				
	A5 card	TP1 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between + 1.497 and +1. 503 v	Go to step 77	Go to step 76
76	Control Monitor				
	A5 card	R3	Adjust		
	External DMM	Display	+1.500 V	Go to step 77	Replace A5 card and go to step 73
77	Control Monitor				
	45 card	TP3 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between +1. 497 and +1. 503 v	Go to step 79	Go to step 78
78	Control Monitor				
	A5 card	R15	Adjust		
	External DMM	Display	+1. 500 v	Go to step 79	Replace A5 card and go to step 73
79	Control Monitor				
	A5 card	TP2 (HI) and TP5 (RTN)	Monitor		
	External DMM	Display	Between -1.497 and -1.503 v	GO to step 81	Go to step 80
80	Control Monitor				
	A5 card	R11	Adjust		

Table 2-9. MCU Stimuli Self-Test Troubleshooting Procedures - Continued

Step	UNIT group	Item	Action/Indication	Yes	No
80 (cont)	External DMM	Display	-1.500 v	Go to step 81	Replace A5 card and go to step 73
81	. . .	Control Monitor	Tag for calibration team and rerun Control Monitor self-test procedures	. . .	. . .
	◀ NOTE ▶ Steps 82 and 83 are applicable to a TSGMS equipped to support M65 with C -NITE only.				
82	Power adapter	PATCH switch	Down (off)		
	Target power cable W1l	W1lXP1	Disconnect from IR target assembly J1		
		WllXP1-F (HI) to WllXP1-M (LO)	Monitor		
	Power adapter	PATCH switch	Up (on)		
	External DMM	Display	+24.0 to +28. 5 V	Replace IR target assembly	Go to step 83
83	Power adapter	PATCH switch	Down (off)		
	Target power cable W1l	W11XP2	Disconnect from power adapter J2		
	Power adapter	J2 -F (HI) to J2 -M (LO)	Monitor		
		PATCH switch	Up (on)		
	External DMM	Display	+24.0 to +28. 5 V	Replace cable W11	Replace power adapter

Table 2-10. Checkout XM65 Power Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄ NOTE ►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section, for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0. 30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable WI	W1XP1-A, B, C to WlXP237-A, B, C respectively	Monitor		
	External DMM	Display	Less than 0. 002K ohms	Go to step 2	Replace cable W1
	Cable W6	W6XP6 -e to W6XP327-NN and W6XP6-e to W6XJ327-NN	Monitor		
	External DMM	Display	Less than 0. 002K ohms	Go to step 3	Replace cable W6

Table 2-10. Checkout XM65 Power Failed

Step	UNIT group	Item	Action/indication	Yes	No
		CAUTION			
	Avoid bending pins when connecting the following cable.				
3	Cable W1	W1XP1 to Control Monitor J1/ POWER connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON	Go to step 4	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
		PWR ON indicator	Lit		
4	DMM	MODE	DC		
		VOLTS/OHMS	200K/200 V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28. 5 V	Go to step 5	Replace Control Monitor
5	TARGET CONTROL	TARGET	OFF		
	MANUAL CONTROLS	REMOTE ON COMMAND	REMOTE ON COMMAND		
	. . .	J6 pin e (HI) to J2 pin D (LO)	+25.0 to +28.5 V	Go to step 6	Replace Control Monitor
6	MANUAL CONTROLS	REMOTE ON COMMAND	NORMAL		
	. . .	. . .	BIT IN TEST and BIT PASS 1-10 indications were as shown in Checkout XM65 Power	Go to step 7	Replace A22 card; if malfunction persists,

Table 2-10. Checkout XM65 Power Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6 (Cont)					replace Control Monitor
7	. . .	. . .	TIMER INTERRUPT T6-T14 and SEQUENCE 2 PHASE indications were as shown in Checkout XM65 Power	Go to step 8	Replace A16 card: if malfunction persists, replace Control Monitor
8	. . .	. .	DMM indications were as shown in Checkout XM65 Power	Go to step 9	Replace Control Monitor
9	. . .	. .	COUNTER TIMER indications were as shown in Checkout XM65 Power	Control Monitor is not faulty	Go to step 10
10	Power	Power switch	OFF		
	. . .	A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A14 card	Pin 27 (HI) and TP1 (RTN)	Monitor		
	Counter/Timer	Display	Between 0.999 and 1.001 kHz	Replace A15 card	Replace A14 card: if malfunction persists, replace Control Monitor

Table 2-11. Checkout Programmer Timing Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE ►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more, A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to inaction/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B, C to W1XP237-A, B, C, respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W5	W5XP5-B, C, D, F, H, J, K, L, X, e to W5XP330-B, C, D, F, H, J, K, L, X, e respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W5

Table 2-11. Checkout Programmer Timing Failed -Continued

Step	UNIT group	Item	Action/indication	Yes	No
			CAUTION		
			Avoid bending pins when connecting the following cable.		
3	Cable W1	W1XP1 to Control Monitor J1/POWER connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch PWR ON indicator	PWR ON Lit	Go to step 4	Perform Control Monitor self-test procedures in TM 9-4935-473-14-1
4	DMM	MODE VOLTS/OHMS	DC 200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28.5 V	Go to step 5	Replace Control Monitor
5	TARGET CONTROL	TARGET	OFF		
	TIMER INTERRUPT	Start switch	START		
	DMM	VOLTS/ OHMS	20K/20V		
	. . .	J5 pin C (HI) to A16 card TP5 (LO)	+9.5 to +11.5 V	Go to step 6	Replace Control Monitor

Table 2-11. Checkout Programmer Timing Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	TIMER INTERRUPT . . .	Start switch . . .	OFF TIMER INTERRUPT T6-T17 indications were as shown in Checkout Programmer Timing	Go to step 7	Replace A16 card; if malfunction persists, replace Control Monitor
7	. . .	. . .	COUNTER/TIMER indications were as shown in Checkout Programmer Timing	Control Monitor is not faulty	Replace A15 card; if malfunction persists, replace A16 card; if malfunction persists, replace Control Monitor

Table 2-12. Checkout Open Loop Commands Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE ►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B, C to W1XP237-A, B, C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W3	W3XP3-X, Z, BB, CC, DD, EE, a, d to W3X2P05-X, Z, BB, CC, DD, EE, a, d, respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W3

Table 2-12. Checkout Open Loop Commands Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Cable W4	W4XP4-W to W4XP332-W	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 4	Replace cable W4
4	Cable W5	W5XP5-U, v, e, k, m to W5XP330-U,V,e,k,m, respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 5	Replace cable W5
5	Cable W6	W6XP6-f to W6XP327-E	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 6	Replace cable W6
		CAUTION			
		Avoid bending pins when connecting the following cable.			
6	Cable W1	W1XP1 to Control Monitor J1/POWER connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 7	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
7	DMM	MODE VOLT/OHMS	DC 200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		

Table 2-12. Checkout Open Loop Commands Failed - Continued

Step	UNIT group		Action/indication	Yes	No
7 (cont)	TARGET CONTROL J2	TARGET Pin A (HI) to pin D (LO)	PWR ON +25.0 to +28.5 V	Go to step 8	Replace Control Monitor
8	TARGET CONTROL DMM	TARGET MODE VOLTS OHMS Display	OFF OHMS 2 MEG OPEN when test leads are separated and SHORT when test leads are together	Go to step 9	Replace Control Monitor
9	Scope Control Monitor . . .	VOLTS/DIV TIME/DIV . . .	2 1 MSEC GYRO ROLL and GYRO PITCH were adjusted to 0.0 as shown in Checkout Open Loop Command	Go to step 10	Replace power conversion assembly; if malfunction persists, replace Control Monitor
10	AUTOMATIC TEST J3	TEST NUMBER Pins DD, z, x, CC, BB, (HI) to EE (LO)	21 OPEN---pin DD OPEN---pin z OPEN---pin x OPEN---pin CC OPEN---pin BB	Go to step 11	Replace A8 card; if malfunction persists, replace Control Monitor
11	J5	Pins m, k, u, v (HI) to e (LO)	OPEN---pin m OPEN--- pin k OPEN--- pin U OPEN--- pin V	Go to step 12	Replace A8 card; if malfunction persists, replace Control Monitor
12	AUTOMATIC TEST J3	Mode switch Pins DD, z, x, CC, BB (HI) to EE (LO)	AUTO OPEN ---pin DD SHORT---pin z SHORT---pin x SHORT--- pin CC SHORT---pin BB	Go to step 13	Go to step 15

Table 2-12. Checkout Open Loop Commands Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
13	J5	Pins m, k, U, V (HI) to e (LO)	SHORT --- pin m SHORT --- pin k SHORT --- pin U SHORT --- pin V	Go to step 14	Go to step 15
14	DMM	CHANNEL SELECTOR	Y2		
		TEST SELECTOR 2	8		
		Display	OPEN	Go to step 17	Replace Control Monitor
15	AUTOMATIC TEST	Mode switch	MANUAL		
	Power	Power switch	OFF		
	. . .	Back panel A8 card	Remove Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE VOLTS/OHMS	DC 20K/20V		
	A8 card	Pins 24, 25, 23 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO ---pin 24 LO ---pin 25 HI ---pin 23	Replace A8 card; if malfunction persists, replace Control Monitor	Go to step 16
16	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4 5, 18, 19, 20, 1 (HI), and 24 (RTN	Monitor		

Table 2-12. Checkout Open Loop Commands Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16 (cont)	DMM	Display	LO--- pin 2 HI --- pin 3 LO--- pin 4 LO--- pin 5 HI --- pin 18 LO--- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
17	. . .	. . .	TSU AZ POSITION was adjusted to +2.0 as shown in Checkout Open Loop Command	Go to step 18	Replace A7 card: if malfunction persists, replace Control Monitor
18	DMM	MODE VOLTS/OHMS	OHMS 2 MEG		
	AUTOMATIC TEST	TEST NUMBER	22		
	DMM	Display	OPEN	Go to step 20	Go to step 19
19	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/ OHMS	20K/20V		
		MODE	Dc		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN	Monitor		
	DMM	Display	LO--- pin 2 HI --- pin 3 LO--- pin 4 LO--- pin 5 LO--- pin 18 HI --- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-12. Checkout Open Loop Commands Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
20	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/ OHMS	20K/20V		
	A4 card	Pins 10(HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 22	Go to step 21
21	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 26 HI --- pin 27 LO--- pin 28 LO--- pin 29 LO--- pin 37 HI --- pin38 LO--- pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor
22	Power	Power switch	OFF		
	. . .	TJ13 and J4 pin W	Jumper		
	COUNTER/TIMER	Self test/ normal switch	SELF TEST		
	Power	Power switch	PWR ON		
	. . .	J6 pin f (HI) and TJ30 (LO)	Monitor		

Table 2-12. Checkout Open Loop Commands Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
22 (cont)	Scope	Display	6 Vp-p 400 Hz sine wave	Replace Control Monitor	Replace A4 card: if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed

Step	UNIT group	Item	Action/indication	Yes	No
			◄ NOTE ►		
			1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.		
			2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.		
			3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).		
			4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.		
			5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.		
			6. These procedures are also based on the assumption that TSGMS cables are not faulty.		
			7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.		
			8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.		
			9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.		
1	Cable W1	W1XP1-A, B, C to W1XP237-A, B, C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W3	W3XP3-T, U, x, z, EE to W3X2P05-T, U, X, Z, EE respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W3

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Cable W4	W4XP4-J, V to W4X332-J,V respectively	Monitor		
	Internal DMM	Display	Less than 0.002K ohms	Go to step 4	Replace cable W4
4	Cable W5	W5XP5-e, k to W5XP330-e, k respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 5	Replace cable W5
		CAUTION			
		Take care to avoid bending pins when connecting the following cable.			
5	Cable W1	W1XP1 to Control Monitor J1/ POWER connector	Connect		
	Cable W1	WlXP237 to a +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON	Go to step 6	Perform Control Monitor self-test procedures in TM 9-4935-473-14-1
		PWR ON indicator	Lit		
6	DMM	MODE	DC		
		VOLTS/ OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28. 5 V	Go to step 7	Replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
7	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 8	Replace Control Monitor
8	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A8 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/OHMS	2K/2V		
		MODE	DC		
	AUTOMATIC TEST	TEST NUMBER	92		
	A8 card	Pins 24, 25, 23 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 24 LO--- pin 25 LO--- pin 23	Go to step 10	Go to step 9
9	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/OHMS	20K/20V		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
9 (cont)	DMM	Display	HI --- pin 2 LO--- pin 3 LO--- pin 4 HI --- pin 5 LO--- pin 18 HI --- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
10	A8 card	Pins 21 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 11	Replace control Monitor
11	AUTOMATIC TEST	TEST NUMBER	93		
		Mode switch	AUTO		
	DMM	VOLTS/ OHMS	20K/20V		
	A8 card	Pins 24, 25, 23 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI--- pin 24 HI--- pin 25 HI--- pin 23	Go to step 13	Go to step 12
12	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI --- pin 2 LO--- pin 3 LO--- pin 4 HI --- pin 5 HI --- pin 18 HI --- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
13	A8 card	Pins 21 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 14	Replace Control Monitor
14	Power	Power switch	OFF		
	. . .	A8 card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A13 card	Pins 14, 15, 12 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI --- pin 14 HI --- pin 15 HI --- pin 12	Go to step 15	Replace A20 card; if malfunction persists, replace Control Monitor
15	A13 card	Pins 27 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 16	Replace Control Monitor
16	A13 card	Pins 3 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 17	Replace A21 card; if malfunction persists, replace Control Monitor
17	AUTOMATIC TEST	TEST NUMBER	92		
	DMM	VOLTS/ OHMS	2K/2V		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
17 (cont)	A13 card	Pins 14, 15, 12 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 14 LO--- pin 15 LO-- - pin 12	Go to step 18	Replace A20 card, if malfunction persists, replace Control Monitor
18	A13 card	Pins 27 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 19	Replace Control Monitor
19	A13 card	Pins 3 (Hi) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 20	Replace A21 card; if malfunction persists, replace Control Monitor
20	Power	Power switch	OFF		
	. . .	A13 card	Reinstall in original position		
		A12 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A12 card	Pins l, 2, 3, 4, 5, 33 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 1 LO--- pin 2 LO--- pin 3 LO--- pin 4 LO--- pin 5 LO --- pin 33	Go to step 21	Replace A20 card: if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
21	AUTOMATIC TEST	TEST NUMBER	93		
	DMM	VOLTS/ OHMS	20K/20V		
	A12 card	Pins l, 2, 3, 4, 5, 33 (HI), and 18 (RTN)			
	DMM	Display	HI-- - pin 1 HI--- pin 2 HI--- pin 3 HI--- pin 4 HI- -- pin 5 HI-- - pin 33	Go to step 22	Replace A20 card; if malfunction persists, replace Control Monitor
22	Power	Power switch	OFF		
	. . .	A12 card	Reinstall unoriginal position		
		Al1 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	All card	Pins 31, 32, 33, 13 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI--- pin 31 HI--- pin 32 HI--- pin 33 HI--- pin 13	Go to step 23	Replace A20 card; if malfunction persists, replace Control Monitor
23	AUTOMATIC TEST	TEST NUMBER	92		
	DMM	VOLTS/ OHMS	2K/2V		
	All card	Pins 31, 32, 33, 13 (HI), and 18 (RTN)	Monitor		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
23 (cont)	DMM	Display	LO--- pin 31 LO--- pin 32 LO--- pin 33 LO--- pin 13	Go to step 24	Replace A20 card; if malfunction persists, replace Control Monitor
24	Power	Power switch	OFF		
	. . .	All card	Reinstall in original position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A14 card	Pins 1, 14, 12, 13, 24 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 1 LO---pin 14 LO--- pin 12 LO--- pin 13 LO--- pin 24	Go to step 25	Replace A20 card; if malfunction persists, replace Control Monitor
25	DMM	VOLTS/OHMS	20K/20V		
	A14 card	Pins 32 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 26	Replace Control Monitor
26	AUTOMATIC TEST	Mode switch	MANUAL		
		TEST NUMBER	93		
	A14 card	Pins 1, 14, 12, 13, 24 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI- --pin 1 HI--- pin 14 HI--- pin 12 HI--- pin 13 HI--- pin 24	Go to step 27	Replace A20 card: if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27	DMM	VOLTS/OHMS	2K/2V		
	A14 card	Pins 32 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 28	Replace Control Monitor
28	A20 card	S1 segments 2 3, and 4	ON		
		Light emitting diodes	Not lit	Go to step 29	Replace A20 card; if malfunction persists, replace Control Monitor
29	AUTOMATIC TEST	TEST NUMBER	92		
	A20 card	Light emitting diodes	Lit	Go to step 30	Replace A20 card; if malfunction persists, replace Control Monitor
30	A20 card	S1 segments 2, 3, and 4	OFF		
	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A12 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 31	Replace A21 card; if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
31	AUTOMATIC TEST	TEST NUMBER	93		
	DMM	VOLTS/OHMS	20K/20V		
	A12 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 32	Replace A21 card; if malfunction persists, replace Control Monitor
32	Power	Power switch	OFF		
	. . .	A12 card	Reinstall in original position		
		A6 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A6 card	Pins 35, 20, 32, 34 (HI), and 18 (R TN)	Monitor		
	DMM	Display	HI--- pin 35 HI--- pin 20 HI--- pin 32 HI--- pin 34	Go to step 33	Replace A21 card; if malfunction persists, replace Control Monitor
33	DMM	VOLTS/OHMS	2K/2V		
	A6 card	Pins 30 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 34	Replace Control Monitor
34	A6 card	Pins 26 (HI) and 18 (RTN)	Monitor		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
34 (cont)	DMM	Display	LO	Go to step 35	Replace A7 card; if malfunction persists, replace A21 card; if malfunction persists, replace Control Monitor
35	DMM	VOLTS/ OHMS	20K/20V		
	A6 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 36	Replace A20 card; if malfunction persists, replace Control Monitor
36	AUTOMATIC TEST	Mode switch	AUTO		
		TEST NUMBER	92		
	DMM	VOLTS/ OHMS	2K/2V		
	A6 card	Pins 35, 20, 32, 34 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 35 LO--- pin 20 LO--- pin 32 LO--- pin 34	Go to step 37	Replace A21 card; if malfunction persists, replace Control Monitor
37	DMM	VOLTS/ OHMS	2OK/20V		
	A6 card	Pins 30 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 38	Replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
38	A6 card	Pins 26 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 39	Replace A7 card; if malfunction persists, replace A21 card; if malfunction persists, replace control Monitor
39	DMM	VOLTS/ OHMS	2K/2V		
	A6 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 40	Replace A20 card; if malfunction persists, replace Control Monitor
40	Power	Power switch	OFF		
	. . .	A6 card	Reinstall in original position		
		A7 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode Switch	MANUAL, then to AUTO		
	A7 card	Pins 35, 20, 32, 34, 26 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 35 LO--- pin 20 LO--- pin 32 LO--- pin 34 LO--- pin 26	Go to step 41	Replace A21 card; if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
41	DMM	VOLTS/ OHMS	20K/20V		
	A7 card	Pins 30 (HI) and 18 (RTN	Monitor		
	DMM	Display	HI	Go to step 42	Replace Control Monitor
42	DMM	VOLTS/ OHMS	2K/2V		
	A7 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	L O	Go to step 43	Replace A20 card; if malfunction persists, replace Control Monitor
43	AUTOMATIC TEST	TEST NUMBER	93		
		Mode switch	MANUAL		
	DMM	VOLTS/ OHMS	20K/20V		
	A7 card	Pins 35, 20, 32, 34, 26 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI--- pin 35 HI--- pin 20 HI--- pin 32 HI--- pin 34 HI --- pin 26	Go to step 44	Replace A21 card; if malfunction persists, replace Control Monitor
44	DMM	VOLTS/ OHMS	2K/2V		
	A7 card	Pins 30 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 45	Replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	
45	DMM	VOLTS OHMS	20K/20V		
	A7 card	Pins 31 (HI) and 18 (RTN)	Monitor		
	DMM	Display	+4 V (approx)	Go to step 46	Replace A20 card; if malfunction persists, replace Control Monitor
46	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes	Not lit	Go to step 47	Replace A21 card; if malfunction persists, replace Control Monitor
47	AUTOMATIC TEST	TEST NUMBER	92		
	A21 card	Light emitting diodes	Lit	Go to step 48	Replace A21 card: if malfunction persists, replace Control Monitor
48	A21 card	Z5 S1 and S4	OFF		
	Power	Power switch	OFF		
	. . .	A7 card	Reinstall in original position		
	Power	Power switch	PWR ON		
	. . .	. . .	AUTOMATIC TEST TEST NUMBER 23 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 50	Go to step 49
49	AUTOMATIC TEST	TEST NUMBER	23		
	A20 card	S1 segments 2, 3, and 4	ON		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
49 (cont)		Light emitting diodes DS5, DS1l, DS13, DS14, DS16, and DS22	Not lit	Replace A13 card; if malfunction persists, replace A12 card; if malfunction persists, replace Control Monitor	Replace A20 card; if malfunction persists, replace Control Monitor
50	. . .	. . .	TSU AZ and EL indications were as shown in Checkout MCA Limits, CVAC, and G-Bias	Go to step 51	Replace Control Monitor
51	. . .	. . .	AUTOMATIC TEST TEST NUMBER 24 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 53	Go to step 52
52	AUTOMATIC TEST A20 card	TEST NUMBER S1 segments 2, 3, and 4 Light emitting diodes DS2, DS5, DS1l, DS12, DS14, DS16, and DS22	24 ON Not lit	 Replace A13 card; if malfunction persists, replace A12 card; if malfunction persists, replace Control Monitor	 Replace A20 card; if malfunction persists, replace Control Monitor
53	. . .	. . .	AUTOMATIC TEST TEST NUMBER 26 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 55	Go to step 54
54	AUTOMATIC TEST A20 card	TEST NUMBER S1 segments 2, 3, and 4	26 ON		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
54 (cont)		Light emitting diodes DS5, DS10, DS14, DS16, and DS22	Not lit	Replace A12 card; if malfunction persists, replace Control Monitor	Replace A20 card: if malfunction persists, replace Control Monitor
55	. . .	. . .	AUTOMATIC TEST TEST NUMBER 25 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 66	Go to step 56
56	AUTOMATIC TEST	TEST NUMBER	25		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS2, DS3 , DS5, DS6, DS1l, DS12, DS13, DS14, DS16, DS21, and DS22	Not lit	Go to step 57	Replace A20 card; if malfunction persists, replace Control Monitor
57	DMM	MODE	OHMS		
		VOLTS/ OHMS	2 MEG		
	J5	Pink (HI) to pin e (LO)	OPEN	Go to step 58	Replace A8 card: if malfunction persists, replace Control Monitor
58	Power	Power switch	OFF		
	. . .	All card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/ OHMS	20K/20V		
	All card	Pins 13 (HI) and 18 (RTN)	Monitor		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
58 (cont)	DMM	Display	HI	Go to step 59	Replace A20 card; if malfunction persists, replace Control Monitor
59	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12	Light emitting diodes DS1 thru DS12	Lit	Go to step 60	Replace A12 card
60	A11	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1 thru DS12	Lit	Go to step 61	Replace A12 card; if malfunction persists, replace All card
61	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS2 , DS3 , DS4, DS9, DS10, DS13, DS14, DS17, DS18, DS19, DS22, and DS23	Lit	Go to step 62	Replace A12 card
62	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS2, DS4, DS5 , DS6, DS8, DSl0, DS12, DS13, DS14, DS16, DS20, and DS23	Lit	Go to step 63	Replace A12 card
63	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1 thru DS12	Lit	Go to step 64	Replace A12 card

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
64	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS3, DS4, DS6, DS8, DS9, DS10, DS12, DS13, DS15, DS17, DS18, and DS24	Lit	Go to step 65	Replace A12 card; go to step 65
65	A12 card	Z1 segments 1 and 2	OFF		
	Power	Power switch	OFF		
	. . .	All card	Reinstalling original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A13 card	Pins 9 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Replace All card; if malfunction persists, replace Al3 card; if malfunction persists, replace Control Monitor	Replace A8 card; if malfunction persists, replace Control Monitor
66	. . .	. . .	AUTOMATIC TEST TEST NUMBER 27 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 82	Go to step 67
67	AUTOMATIC TEST	TEST NUMBER	27		
	A20 card	S1 segments 2, 3, and 4	ON		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
67 (cont)		Light emitting diodes DS1, DS2, DS5, DS6, DS10, DS13, DS14, DS16, DS17, and DS18	Not lit	Go to step 68	Replace A20 card; if malfunction persists, replace Control Monitor
68	A20 card	S1 segments 2, 3, and 4	OFF		
	DMM	MODE	OHMS		
		VOLTS/ OHMS	2 MEG		
	J 3	Pin z, x (HI) to EE (LO)	OPEN---pinz OPEN---pinx	Go to step 69	Replace A8 card; if malfunction persists, replace Control Monitor
69	Power	Power switch	OFF		
	. . .	A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/ OHMS	2K/2V		
	A13 card	Pins 9 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 70	Replace A8 card; if malfunction persists, replace Control Monitor
70	Power	Power switch	OFF		
	. . .	A13 card	Reinstall unoriginal position		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
70 (cont)	AUTOMATIC TEST	Mode switch	AUTO		
	DMM	VOLTS OHMS	20K/20V		
	A14 card	Pins 6, 7, 8, 9, 10 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 6 LO--- pin 7 LO- -- pin 8 LO--- pin 9 HI---- pin 10	Go to step 71	Replace A14 card; if malfunction persists, replace Control Monitor
71	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DSl, DS2 , DS9 , and DS10	Not lit	Go to step 72	Replace A21 card; if malfunctlun persists, replace Control Monitor
72	A21 card	Z5 S1 and S4	OFF		
	Power	Power switch	OFF		
		A14 card	Reinstall in original position		
		Al card	Extend using extender card (11499061)		. . .
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	MANUAL, then to AUTO		
	A1 card	Pins 23 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 73	Replace A21 card: if malfunction persists, replace control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
73	DMM	MODE	OHMS		
		VOLTS/ OHMS	2 MEG		
	. . .	Al card pin 28 (HI) to J3 pin U (LO)	SHORT	Go to step 74	Replace Control Monitor
74	. . .	Al card pin 25 (HI) to J3 pin T (LO)	SHORT	Go to step 75	Replace Control Monitor
75	. . .	Al card pin 33 (HI) to J4 pin V (LO)	SHORT	Go to step 76	Replace Control Monitor
76	. . .	Al card pin 24 (HI) to J4 pin J (LO)	SHORT	Go to step 77	Replace Control Monitor
77	Power	Power switch	OFF		
	. . .	Al card	Reinstall in original position		
		All card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	Mode switch	MANUAL		
		RESET	Press and release		
	A12 card	Light emitting diodes DS1 thru DS12	Lit	Go to step 78	Replace A12 card; if malfunction persists, replace Control Monitor
78	All card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1 thru DS12	Lit	Go to step 79	Replace A12 card; if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
79	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS3 , DS6 , DS9, DS1l, DS13, DS16, DS17, DS22, DS23, and DS24	Lit	Go to step 80	Replace A12 card; if malfunction persists, replace Control Monitor
80	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS3 , DS4, DS6 , DS7 , DS1l, DS13, DS15, DS18, and DS24	Lit	Go to step 81	Replace A12 card; if malfunction persists, replace Control Monitor
81	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS2 , DS3 , DS5, DS6, DS1l, DS12, DS13, DS14, DS17, and DS23	Lit	Replace A6 card; if malfunction persists, replace A7 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
82	. . .	. . .	AUTOMATIC TEST TEST NUMBER 28 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 85	Go to step 83
83	AUTOMATIC TEST	TEST NUMBER	28		
	A20 card	S1 segment 2, 3, and 4	ON		
		Light emitting diodes DS1, DS2, DS5 , DS6, DS10, DS12, DS14, DS16, DS17, and DS18	Not Lit	Go to step 84	Replace A20 card: if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
84	A20 card	S1 segments 2, 3, and 4	OFF		
	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DS1, DS2 , DS9 , DS10, and DS14	Not lit	Replace Al card; if malfunction persists, replace Control Monitor	Replace A21 card; if malfunction persists, replace Control Monitor
85	. . .	. . .	AUTOMATIC TEST TEST NUMBER 29 passed in Checkout MCA Limits, CVAC, and G-Bias	Go to step 88	Go to step 86
86	AUTOMATIC TEST	TEST NUMBER	29		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS1, DS2, DS5, DS6, DS10, DS12, DS13, DS14, DS16 DS17, and DS18	Not lit	Go to step 87	Replace A20 card; if malfunction persists, replace Control Monitor
87	A20 card	S1 segments 2, 3, and 4	OFF		
	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DS1, DS2, DS5, DS9, and and DS10	Not lit	Control Monitor is not faulty	Replace A21 card; if malfunction persists, replace, Control Monitor
88	. . .	. . .	AUTOMATIC TEST TEST NUMBER 30 passed in Checkout MCA Limits, CVAC, and G-Bias	Control Monitor is not faulty	Go to step 89

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/Indication	Yes	No
89	AUTOMATIC TEST	TEST NUMBER	30		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS1, DS2, DS5, DS6, DS10, DS1l, DS14, DS16, DS17, and DS18	Not lit	Go to step 90	Replace A20 card; if malfunction persists, replace Control Monitor
90	A20 card	S1 segments 2, 3, and 4	OFF		
	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DS1, DS2, DS5, DS9, DS10, and DS14	Not lit	Control Monitor is not faulty	Replace A21 card; if malfunction persists, replace Control Monitor
		◄NOTE►			
	Steps 91, 92, and 93 are applicable to a TSGMS equipped to support M65 with C-NITE only.				
91	AUTOMATIC TEST	TEST NUMBER	61		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS5, DS1l, DS13, DS14, DS16, and DS22	Not lit	Replace A13 card; if malfunction persists, replace A12 card; if malfunction persists, replace Control Monitor	Replace A20 card; if malfunction persists, replace Control Monitor
92	AUTOMATIC TEST	TEST NUMBER	62		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS2, DS5, DS1l, DS12, DS14, DS16, and DS22	Not lit	Replace A13 card; if malfunction persists, replace A12 card; if malfunction persists, replace Control Monitor	Replace A20 card; if malfunction persists, replace Control Monitor

Table 2-13. Checkout MCA Limits, CVAC, and G-Bias Failed - Continued

Step	UNIT group	Item	Action/Indication	Yes	No
93	AUTOMATIC TEST	TEST NUMBER	63		
	A20 card	S1 segments 2, 3, and 4	ON		
		Light emitting diodes DS5, DS10, DS14, DS16, and DS22	Not Lit	Replace A12 card; if malfunction persists, replace Control Monitor	Replace A20 card; if malfunction persists, replace Control Monitor

Table 2-14. Checkout BIT Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄ NOTE ►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS check-out procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W 1	W1XP1-A, B, C to WlXP237-A, B, C, respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W3	W3XP3-K, L, M, r to W3X2P05-K, L, M, r respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W3

Table 2-14. Checkout BIT Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Cable W5	W5XP5-e, m to W5XP330-e, m respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 4	Replace Cable W5
	CAUTION				
	Avoid bending pins when connecting the following cable				
4	Cable W1	W1XP1 to Control Monitor J1/POWER connector	Connect		
	Cable W1	W1XP23 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON indicator		
		PWR ON	Lit	Go to step 5	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
5	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pins A (HI) to pin D (LO)	+25.0 to +28.5 V	Go to step 6	Replace Control Monitor
6	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 7	Replace Control Monitor

Table 2-14. Checkout BIT Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
7	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	J3	Pins L (HI) and r (LO)	Monitor		
	BORESIGHT	AZ switch	Hold to LEFT		
	DMM	Display	+9.5 to +10.5 V or -9.5 to -l0.5 V	Go to step 8	Replace A22 card; if malfunction persists, replace Control Monitor
8	BORESIGHT	AZ switch	Release		
	J3	Pins M (HI) and r (LO)	Monitor		
	BORESIGHT	EL switch	Hold to DOWN		
	DMM	Display	-9.0 to -11.0 V or +9.0 to +11.0 V	Go to step 9	Replace A22 card; if malfunction persists, replace Control Monitor
9	BORESIGHT	EL switch	Release		
	J3	Pins K (HI) and r (LO)	Monitor		
	BORESIGHT	AZ switch	Hold to LEFT		
		EL switch	Hold to DOWN		
	DMM	Display	+9.0 to +11.0 V	Go to step 10	Replace Control Monitor
10	BORESIGHT	AZ switch	Release		
		EL switch	Release		
	. . .	. . .	AZ and EL meter indications were as shown in Checkout BIT	Go to step 11	Replace Control Monitor

Table 2-14. Checkout BIT Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
11	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
	MANUAL CONTROLS	G BIAS	DISABLE		
	J5	Pin m (HI) to pin e (LO)	SHORT	Go to step 12	Replace A8 card: if malfunction persists, replace Control Monitor
12	MANUAL CONTROLS	G BIAS	NORMAL		
	DMM	Display	OPEN	Go to step 13	Replace A8 card; if malfunction persists, replace Control Monitor
13	. . .	. . .	AUTOMATIC TEST TEST NUMBERS 44 through 51 passed in Checkout Bit	Replace Control Monitor	Replace A4 card: if malfunction persists, replace Control Monitor

Table 2-15. Checkout Step Response Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM9-4935-473-14-l must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B, C to WlXP237-A, B, C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W2	W2XP2-T to W2XP1-T	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W2

Table 2-15. Checkout Step Response Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Cable W3	W3XP3-h to W3X2P05-h	Monitor		
	External DMM	Display	Less than 0.002K ohms 3	Go to step 4	Replace cable W3
4	Cable W5	W5XP5-g, h to W5XP330-g, h respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 5	Replace cable W5
		CAUTION			
	Avoid bending pins when connecting the following cable.				
5	Cable W1	W1XP1 to Control Monitor J1/ POWER connector	Connect		
	Cable W1	WlXP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 6	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
6	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28.5 V	Go to step 7	Replace Control Monitor

Table 2-15. Checkout Step Response Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
7	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 8	Replace Control Monitor
8	. . .	. . .	GYRO ROLL and GYRO PITCH were adjusted to 0 as indicated in Check-out Step Response	Go to step 9	Replace power conversion assembly; if malfunc-tion per-sists, replace Control Monitor
9	. . .	. . .	TSU AZ was adjusted to 0 as indicated in Checkout Step Response	Go to step 10	Replace A7 card; if malfunction persists, replace Control Monitor
10	. . .	. . .	TSU EL was adjusted to 0 as indicated in Checkout Step Response	Go to step 11	Replace A6 card; if malfunction persists, replace Control Monitor
11	. . .	. . .	COUNTER/TIMER indication was as shown in Checkout Step Response	Go to step 13	Go to step 12
12	Power	Power switch	OFF		
	. . .	A16 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		

Table 2-15. Checkout Step Response Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
12 (cont)	A16 card	Pin 6 (HI) and TP5 (RTN)	Monitor		
	DMM	Display	+10.0V	Replace A15 card	Replace A16 card; if malfunction persists, replace Control Monitor
13	MANUAL CONTROLS	CLUTCH ENGAGE	CLUTCH ENGAGE		
	DMM	VOLTS/OHMS	20K/20V		
		MODE	DC		
	. . .	J3 pin h (HI) to J2 pin T (LO)	+9.0 to +11.0 V	Go to step 17	Go to step 14
14	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		Al card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/OHMS	2K/2V		
	A1 card	Pins 23 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Go to step 15	Replace A21 card; if malfunction persists, replace Control Monitor
15	DMM	VOLTS/OHMS	20K/20V		
	A1 card	Pins 11, 12 (HI), and 18 (RTN)	Monitor		
	DMM	Display	LO--- pin 11 HI--- pin 12	Go to step 16	Replace Control Monitor

Table 2-15. Checkout Step Response Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
16	A1 card	Pins 9 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO	Replace Al card; if malfunction persists, replace Control Monitor	Replace A20 card; if malfunction persists, replace Control Monitor
17	. . .	. . .	RHO was adjusted to 79.7 to 79.9 as indicated in Checkout Step Response	Go to step 18	Replace Control Monitor
18	. . .	. . .	AUTOMATIC TEST TEST NUMBER 32 passed in Checkout Step Response	Go to step 25	Go to step 19
19	AUTOMATIC TEST	TEST NUMBER	32		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7 8, 9, 15, 17 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37 (HI), and 24 (RTN)	Monitor		

Table 2-15. Checkout Step Response Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
19 (cont)	DMM	Display	HI--- pin 11 HI--- pin 6 LO --- pin 7 HI--- pin 8 LO--- pin 9 LO--- pin 15 LO--- pin 17 HI--- pin 16 LO--- pin 34 HI--- pin 33 HI--- pin 32 HI--- pin 31 LO--- pin 30 LO--- pin 14 HI--- pin 13 HI--- pin 12 HI--- pin 35 HI--- pin 36 LO--- pin 37	Go to step 20	Replace A20 card; if malfunction persists, replace Control Monitor
20	Power	Power switch	OFF		
	. .	A20 card	Reinstall unoriginal position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 10, 7, 45, 44, 43, 47 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI--- pin 4 HI--- pin 10 LO--- pin 7 HI--- pin 45 HI--- pin 44 LO--- pin 43 LO- -- pin 42	Go to step 21	Replace A21 card; if malfunction persists, replace Control Monitor
21	Power	Power switch	OFF		
	. . .	A11 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Z1 segments 1 and 2	ON		

Table 2-15. Checkout Step Response Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
21 (cont)	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS2, DS3, DS4, DS5, DS8, DS9, DS1l, DS14, DS15, DS16, DS18, and DS23	Lit	Go to step 22	Replace A12 card; if malfunction persists, replace Control Monitor
22	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DSl, DS4, DS7, DS8, DS9, DS10, DS1l, DS13, DS17, DS19, DS21, DS23, and DS24	Lit	Go to step 23	Replace A12 card; if malfunction persists, replace Control Monitor
23	A12 card	Z1 segments 1 and 2	OFF		
	Power	Power switch	OFF		
	. . .	A11 card	Reinstall unoriginal position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	JOLTS/OHMS	2K/2V		
	A13 card	Pins 9 (HI) and 18 (RTN)	Monitor		
	DMM	Display	L0	Go to step 24	Replace A8 card; if malfunction persists, replace Control Monitor

Table 2-15. Checkout Step Response Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
24	DMM	MODE	OHMS		
		VOLTS OHMS	2 MEG		
	. . .	J5 pin h (HI) to A13 card pin 11 (LO)	SHORT	Replace A13 card; if malfunction persists, replace A11 card; if malfunction persists, replace Control Monitor	Replace A8 card; if malfunction persists, replace Control Monitor
25	MANUAL CONTROLS	CLUTCH ENGAGE	NORMAL		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
	. . .	J3 pin h (HI) to J2 pin T (LO)	OPEN	Go to step 26	Replace A1 card; if malfunction persists, replace Control Monitor
26	. . .	. . .	AUTOMATIC TEST TEST NUMBER 33 passed in Checkout Step Response	Control Monitor is not faulty	Go to step 27
27	AUTOMATIC TEST	TEST NUMBER	33		
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		

Table 2-15. Checkout Step Response Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
2 7 (cont)	A20 card	Pins 11, 6, 7 8, 9, 15, 17 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 11 HI ---pin 6 LO---pin 7 HI ---pin 8 LO---pin 9 LO---pin 15 HI ---pin 17 LO---pin 16 LO---pin 34 HI ---pin 33 HI ---pin 32 HI ---pin 31 HI ---pin 30 LO ---pin 14 HI ---pin 13 HI ---pin 12 HI ---pin 35 HI ---pin 36 LO ---pin 37	Go to step 28	Replace A20 card; if malfunction persists, replace Control Monitor
28	Power	Power switch	OFF		
	. . .	A20 card	Reinstall unoriginal position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 10, 7, 45, 44, 43, 42 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 4 HI ---pin 10 LO--- pin 7 HI ---pin 45 HI ---pin 44 LO---pin 43 LO--- pin 42	Go to step 29	Replace A21 card; if malfunction persists, replace Control Monitor

Table 2-15. Checkout Step Response Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
29	Power	Power switch	OFF		
	. . .	A11 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS2, DS3, DS9, DS10, DS1l, DS12, DS14, DS18, DS19, DS22, and DS24	Lit	Go to step 30	Replace A12 card; if malfunction persists, replace Control Monitor
30	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS2, DS4, DS1l, DS12, DS13, DS15, DS17, DS19, DS20, DS23, and DS24	Lit	Go to step 31	Replace A12 card; if malfunction persists, replace Control Monitor
31	A12 card	Z1 segments 1 and 2	OFF		
	Power	Power switch	OFF		
	. . .	A11 card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	OHMS		
		VOLTS/OHM:	2 MEG		

Table 2-15. Checkout Step Response Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
31 (cont)	. . .	J5 pin g (HI) to A13 card pin 11 (LO)	SHORT	Replace A13 card; if malfunction persists, replace A11 card; if malfunction persists, replace Control Monitor	Replace A8 card; if malfunction persists, replace Control Monitor

Table 2-16. Checkout Error Detector Gain Program Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1 repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (O on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B, C to WlXP237-A,B,C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W4	W4XP4-J, R, V to W4XP332-J,R,V respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W4

Table 2-16. Checkout Error Detector Gain Program Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
			CAUTION		
			Avoid bending pins when connecting the following cable.		
3	Cable W1	W1XP1 to Control Monitor J1/ POWER connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 4	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
4	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGETCONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28.5 V	Go to step 5	Replace Control Monitor
5	TARGETCONTROL	TARGET	OFF		
	DMM	M0DE	OHMS		
		VOLTS/OHMS	2 MEG		
		Display	Open when test leads are separated and SHORT when test leads are together	Go to step 6	Replace Control Monitor

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	. . .	. . .	AZ and EL ANALOG METERS were adjusted to O as shown in Check-out Error Detector Gain Program	Go to step 7	Replace Control Monitor
7	. . .	. . .	AUTOMATIC TEST TEST NUMBER 08 passed in Checkout Error Detector Gain Program	Go to step 27	Go to step 8
8	AUTOMATIC TEST	TEST NUMBER	0 8		
	Power	Power switch	OFF		
	. . .	Back paneL	Remove		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	AUTO		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	A14 card	Pins 6, 7, 8, 9, 10 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	HI--- pin 6 LO--- pin 7 LO- -- pin 8 LO- - -pin 9 LO---pin 10	Go to step 9	Go to step 13
9	AUTOMATIC TEST	Mode switch	MANUAL		
	DMM	VOLTS/OHMS	2K/2V		
	A14 card	Pin 35 (HI) and TP1 (RTN)	Monitor		
	DMM	Display	LO	Go to step 1	Go to step 10

Table 2-16. Checkout Error Detector Gain Program Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
10	A14 card	Pin 25 (HI) and TP1 (RTN)	Monitor		
	DMM	Display	LO	Go to step 11	Replace A16 card; if malfunction persists, replace Control Monitor
11	A14 card	Pin 24 (HI) and TP1 (RTN)	Monitor		
	DMM	Display	LO	Replace A14 card	Go to step 12
12	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 2 LO---pin 3 LO---pin 4 LO---pin 5 LO--- pin 18 LO--- pin 19 LO---pin 20 HI--- pin 1	Replace A20 card	Replace Control Monitor
13	A14 card	Pins 13, 12, 14, l (HI), and TP1 (RTN)	Monitor		
	DMM	Display	LO- --pin 13 LO- --pin 12 LO- --pin 14 LO- --pin 1	Replace A14 card	Go to step 14

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
14	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO- -- pin 2 LO- -- pin 3 LO- - -pin 4 LO- - -pin 5 LO---pin 18 LO- -- pin 19 LO--- pin 20 HI--- pin 1	Replace A20 card	Replace Control Monitor

◄NOTE►

Steps 15 through 21 must be performed in sequence. If the sequence is interrupted, return to step 15 and restart sequence.

15	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A11 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC RESET	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS4, DS8, DS9, DS1l, DS13, DS17, DS20, and DS23	Lit	Go to step 16	Go to step 26
16	A11 card	S1 switch	Press and release		

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16 (cont)	A12 card	Light emitting diodes DS1, DS4, DS7, DS8, DS10, DS12, DS13, DS17, and DS19	Lit	Go to step 17	Go to step 26
17	A11 card A12 card	S1 switch Light emitting diodes DS1, DS4, DS6, DS7, DS10, DS1l, DS13, DS16, DS20, DS21, DS22, and DS24	Press and release Lit	Go to step 18	Go to step 26
18	A11 card A12 card	S 1 switch Light emitting diodes DS1, DS4, DS5, DS6, DS7, DS8, DS9, DS10, DS12, DS13, DS16, DS17, DS20, and DS22	Press and release Lit	Go to step 19	Go to step 26
19	A11 card A12 card	S1 switch Light emitting diodes DS1, DS3, DS6, DS9, DS10, DS12, DS13, DS16, DS17, DS18, DS20, DS23, and DS24	Press and release Lit	Go to step 20	Go to step 26
20	A11 card A12 card	S1 switch Light emitting diodes DS1, DS3, DS5, DS8, DS10, DS1l, DS12, DS13, DS15, DS21, DS22, and DS23	Press and release Lit	Go to step 21	Go to step 26

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
21	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS1, DS2, DS13 , DS15, DS16, DS19, DS21, and DS22	Lit	Go to step 22	Go to step 26
22	A12 card	Z1 segments 1 and 2	OFF		
	Power	Power switch	OFF		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
	. . .	A11 card	Reinstall in original position		
		A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
	. . .	A4 card pin 33 to J4 pin V (LO)	SHORT	Go to step 23	Replace Control Monitor
23	. . .	A4 card pin 35 (HI) to J4 pin R (LO:	SHORT	Go to step 24	Replace Control Monitor
24	Power	Power switch	OFF		
	. . .	A4 card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
24 (cont)	A13 card	Pins 8, 3 (HI) and 18 (RTN)	Monitor		
	DMM	Display	LO- -- pin 8 HI--- pin 3	Replace A13 card; if malfunction persists, replace A11 card	Go to step 25
25	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 26 LO--- pin 27 LO--- pin 28 LO-- - pin 29 LO---pin 37 LO- -- pin 38 LO---pin 39 HI--- pin 14	Replace A21 card	Replace Control Monitor
26	Power	Power switch	OFF		
	. . .	A13 card	Reinstall in original position		
		A12 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	VOLTS/OHMS	20K/20V		
	A12 card	Pins 1, 2, 3, 4, 5 (HI), and TP1 (RTN)	Monitor		

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
2 6 (cont)	DMM	Display	LO- -- pin 1 LO- -- pin 2 LO- -- pin 3 HI--- pin 4 LO--- pin 5	Replace A12 card	Replace A20 card; if malfunction persists, replace Control Monitor
27			AUTOMATIC TEST TEST NUMBER 09 passed in Checkout Error Detector Gain Program	Go to step 35	Go to step 28
28	AUTOMATIC TEST	TEST NUMBER	09		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	AUTO		
	A14 card	Pins 6, 7, 8, 9, 10 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	LO- -- pin 6 HI- - -pin 7 LO--- pin 8 LO- -- pin 9 LO- -- pin 10	Go to step 31	Go to step 29
29	A14 card	Pins 13, 12, 14, 1 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	HI---pin 13 LO--- pin 12 LO--- pin 14 LO- - -pin 1	Replace A14 card	Go to step 30

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
30	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO--- pin 3 LO--- pin 4 LO--- pin 5 HI--- pin 18 LO--- pin 19 LO--- pin 20 HI--- pin 1	Replace A20 card	Replace Control Monitor
31	AUTOMATIC TEST	Mode switch	MANUAL		
	Power	Power switch	OFF		
	. . .	A20 card	Extend using card extender (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15, 34, 33, 32, 31, 30, 14, 13, 12, (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 11 HI--- pin 6 LO--- pin 7 LO--- pin 8 LO--- pin 9 HI--- pin 15 LO--- pin 34 LO--- pin 33 LO--- pin 32 HI--- pin 31 LO--- pin 30 LO--- pin 14 HI--- pin 13 LO--- pin 12	Go to step 33	Go to step 32

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
32	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 2 LO- --pin 3 LO---pin 4 LO-- -pin 5 HI--- pin 18 LO---pin 19 LO- - -pin 20 HI---pin 1	Replace A20 card	Replace Control Monitor
33	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A13 card	Pins 8, 3 (HI), and TP3 (RTN)	Monitor		
	D M M	Display	HI---pin 8 HI---pin 3	Replace A13 card; if malfunction persists, replace A11 card	Go to step 34
34	Power	Power switch	OFF		
		A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO- --pin 26 LO--- pin 27 LO- --pin 28 LO--- pin 29 HI--- pin 37 LO- --pin 38 LO--- pin 39 HI---pin 14	Replace A21 card	Replace Control Monitor

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
35	. . .	. . .	AUTOMATIC TEST TEST NUMBER 10 passed in Checkout Error Detector Gain Program	Go to step 44	Go to step 36
36	AUTOMATIC TEST	TEST NUMBER	10		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	A14 card	Pins 6, 7, 8, 9, 10 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	LO- -- pin 6 LO- -- pin 7 HI--- pin 8 LO- -- pin 9 LO- -- pin 10	Go to step 39	Go to step 37
37	A14 card	Pins 13, 12, 14, 1, (HI), and TP1 (RTN)	Monitor		
	DMM	Display	LO--- pin 13 HI--- pin 12 LO--- pin 14 LO--- pin 1	Replace A14 card	Go to step 38
38	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
38 (cont)	DMM	Display	HI---pin 2 LO-- -pin 3 LO- --pin 4 LO- - -pin 5 LO---pin 18 LO- --pin 19 LO--- pin 20 LO- - -pin 1	Replace A20 card	Replace Control Monitor
39	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A14 card	Pins 11, 6, 7, 8, 9, 15, 34, 33, 32, 31, 30, 14, 13, 12 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO- -- pin 11 HI---pin 6 LO- - -pin 7 LO---pin 8 LO- -- pin 9 HI---pin 15 LO- --pin 34 LO---pin 33 LO---pin 32 HI--- pin 31 LO---pin 30 LO---pin 14 HI- --pin 13 LO--- pin 12	Go to step 41	Go to step 40
40	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI--- pin 2 LO--- pin 3 LO--- pin 4 LO--- pin 5 LO--- pin 18 LO--- pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
41	Power	Power switch	OFF		
	. . .	A14 card	Reinstall in original position		
		A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	. . .	A4 card pin 14 (HI) to J4 pin J (LO)	SHORT	Go to step 42	Replace Control Monitor
42	Power	Power switch	OFF		
	. . .	A4 card	Reinstall in original position		
		A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A13 card	Pins 8, 3 (HI) and TP3 (RTN)	Monitor		
	DMM	Display	HI--- pin 8 LO--- pin 3	Replace A13 card; if malfunction persists, replace A11 card	Go to step 43
43	Power	Power switch	OFF		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI--- pin 26 LO--- pin 27 LO--- pin 28 LO--- pin 29 LO--- pin 37 LO--- pin 38 LO--- pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor

Table 2-16. Checkout Error Detector Gain Program Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
44	. . .	. . .	AUTOMATIC TEST TEST NUMBER 11 passed in Checkout Error Detector Gain Program	Control Monitor is not faulty	Go to step 45
45	AUTOMATIC TEST	TEST NUMBER	11		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
	. . .	A14 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	AUTOMATIC TEST	Mode switch	AUTO		
	A14 card	Pins 6, 7, 8, 9, 10 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	LO--- pin 6 LO--- pin 7 LO--- pin 8 HI--- pin 9 LO--- pin 10	Go to step 48	Go to step 46
46	A14 card	Pins 13, 12, 14, 1 (HI), and TP1 (RTN)	Monitor		
	DMM	Display	HI---pin 13 HI--- pin 12 LO--- pin 14 LO--- pin 1	Replace A14 card	Go to step 47
47	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-16. Checkout Error Detector Gain Program Failed -Continued

Step	UNIT group	Item	Action/indication	Yes	No
47 (cont)	DMM	Display	HI ---pin 2 LO--- pin 3 LO--- pin 4 LO--- pin 5 HI ---pin 18 LO---pin 19 LO--- pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
48	AUTOMATIC TEST	Mode switch	MANUAL		
	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15, 34, 33, 32, 31, 30, 14, 13, 12 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 11 HI ---pin 6 LO--- pin 7 LO--- pin 8 LO--- pin 9 HI ---pin 15 LO--- pin 34 LO--- pin 33 LO--- pin 32 HI ---pin31 LO--- pin 30 LO--- pin 14 HI ---pin 13 LO--- pin 12	Go to step 50	Go to step step 49
49	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 2 LO--- pin 3 LO--- pin 4 LO--- pin 5 HI ---pin 18 LO---pin 19 LO---pin20 LO--- pin 1	Replace A20 card	Replace Control Monitor
50	Power	Power switch	OFF		
	. . .	A14 card	Reinstalling original position		

Table 2-16. Checkout Error Detector Gain Program Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
50 (cont)	. . .	A13 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A13 card	Pins 8, 3 (HI) and TP3 (RTN)	Monitor		
	DMM	Display	LO--- pin 8 LO--- pin 3	Replace A13 card; if malfunction persists, replace All card	Go to step 51
51	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 LO--- pin 27 LO--- pin 28 LO--- pin 29 HI ---pin 37 LO --- pin 38 LO--- pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor

Table 2-17. Checkout Noise Equivalent Irradiance and Angular Noise Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30V. A logic LO is defined as a voltage level of 0.00V ± 0.30V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B,C to W1XP237-A,B,C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W4	W4XP4-F, P, S,T to W4XP332-F, P,S,T respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W4

Table 2-17. Checkout Noise Equivalent Irradiance and Angular Noise Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
			CAUTION		
			Avoid bending pins when connecting the following cable.		
3	Cable W1	W1XP1 to Control Monitor J1, POWER connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 4	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
4	DMM	MODE	DC		
		VOLTS/OHM	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+28.0 to +28.5 V	Go to step 5	Replace Control Monitor
5	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLT/OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 6	Replace Control Monitor
6	Power	Power switch	OFF		
	. . .	Back panel	Remove		

Table 2-17, Checkout Noise Equivalent Irradiance and Angular Noise Failed -Continued

Step	UNIT group	Item	Action/indication	Yes	No
6 (cont)	Power	Power switch	PWR ON		
	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	AUTOMATIC TEST	TEST NUMBER	03		
	A20 card	S1 segments 2,3, and 4	ON		
		Light emitting diodes DS17 and DS18	Not lit	Go to step 8	Go to step 7
7	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO--- pin 3 LO ---pin 4 LO--- pin 5 HI ---pin 18 HI ---pin 19 LO ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
8	AUTOMATIC TEST	TEST NUMBER	04		
	A20 card	Light emitting diodes DS17 and DS18	Not lit	Go to step 10	Go to step 9
9	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-17. Checkout Noise Equivalent Irradiance and Angular Noise Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
9 (cont)	DMM	Display	LO--- pin 2 LO---pin 3 LO--- pin 4 LO--- pin 5 LO---pin 18 LO---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
10	A20 card	S1 segments 2,3, and 4	OFF		
	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DS3, DS4 , DS9, and DS10	Not lit	Go to step 12	Go to step 11
11	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 26 LO---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 LO---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
12	AUTOMATIC TEST	TEST NUMBER	03		
	A21 card	Light emitting diodes DS3, DS4 , DS5, DS9, and DS10	Not lit	Go to step 14	Go to step 13
13	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		

Table 2-17. Checkout Noise Equivalent Irradiance and Angular Noise Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
13 (cont)	A21 card	Pins 26, 27, 28,29,37, 38,39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin26 LO---pin27 LO---pin28 LO---pin29 HI ---pin37 HI ---pin38 LO---pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor
14	A21 card	Z5 S1 and S4	OFF		
	Power	Power switch	OFF		
	. .	A9 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A9 card	Pins 3, 35 (HI), and 18 (RTN)	Monitor		
	DMM	Display	HI---pin 3 HI---pin35	Go to step 15	Replace A21 card; if malfunction persists, replace Control Monitor
15	AUTOMATIC TEST	TEST NUMBER	04		
	A9 card	Pins 3, 35 (HI), and 18(RTN)	Monitor		
	DMM	Display	LO---pin 3 HI ---pin 35	Replace A9 card; if malfunction persists, replace Control Monitor	Replace A21 card; if malfunction persists, replace Control Monitor

Table 2-18. Checkout IR Boresight Failed

Step	UNIT group	Item	Action/indication	Yes	N o

◂NOTES▸

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS checkout procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages, OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A,B,C to W1XP237-A,B,C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1
2	Cable W5	W5XP5-e, i, m to W5XP330-e,i,m respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 3	Replace cable W5

Table 2-18. Checkout IR Boresight Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
			CAUTION		
			Avoid bending pins when connecting the following cable.		
3	Cable W1	W1XP1 to Control Monitor J1/power connector	Connect		
	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 4	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
4	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28. 5 V	Go to step 5	Replace Control Monitor
5	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLTS OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 6	Replace Control Monitor

Table 2-18. Checkout IR Boresight Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A8 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	J5	Pins m (HI) and e (LO)	Monitor		
	AUTOMATIC TEST	TEST NUMBER	05		
	DMM	Display	OPEN	Go to step 7	Go to step 8
7	AUTOMATIC TEST	TEST NUMBER	06		
	DMM	Display	OPEN	Go to step 10	Go to step 8
8	DMM	MODE	DC		
		VOLTS/OHMS	20K/20V		
	A8 card	Pins 24, 25, 23 (HI) and 18 (RTN)			
	DMM	Display	LO---pin 24 HI ---pin 25 LO---pin 23	Replace A8 card; if malfunction persists, replace Control Monitor	Go to step 9
9	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO---pin 3 LO- -- pin 4 LO--- pin 5 LO---pin 18 HI ---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-18. Checkout IR Boresight Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
10	Power	Power switch	OFF		
	. . .	A8 card	Reinstall in original position		
		A11 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS2, DS3, DS4, DS5, DS10, DS12, DS13, DS18, DS19, DS20, and DS21	Not lit	Go to step 11	Replace A12 card; if malfunction persists, replace Control Monitor
11	A11 card	S1 switch	Press and release		
	A12 card	Light emitting diodes DS2, DS3, DS4, DS5, DS6, DS12, DS13, DS19, DS20, DS21, and DS22	Not lit	Go to step 12	Replace A12 card; if malfunction persists, replace Control Monitor
12	A12 card	Z1 segments 1 and 2	OFF		
	A20 card	S1 segments 2,3, and 4	ON		
		Light emitting diodes DS2, DS13, DS16, DS17, and DS18, and DS24	Not lit	Go to step 13	Replace A20 card, if malfunction persists, replace Control Monitor
13	AUTOMATIC TEST	TEST NUMBER	05		
	A20 card	Light emitting diodes DS2, DS13, DS16, DS17, and DS18	Not lit	Go to step 15	Go to step 14

Table 2-18. Checkout IR Boresight Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
14	Power	Power switch	OFF		
	. . .	A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO--- pin 3 LO---pin 4 LO--- pin 5 HI ---pin 18 LO---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
15	A20 card	S1 segments 2, 3, and 4	OFF		
	A21 card	Z5 S1 and S4	ON		
		Light emitting diodes DS5, DS9, and DS10	Not lit	Go to step 17	Go to step 16
16	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 26 LO---pin 27 LO---pin 28 LO---pin 29 HI ---pin 37 LO---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor

Table 2-18. Checkout IR Boresight Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
17	AUTOMATIC TEST	TEST NUMBER	06		
	A21 card	Light emitting diodes DS9 and DS10	Not lit	Replace All card; if malfunction persists, replace A13 card; if malfunction persists, replace Control Monitor	Go to step 18
18	Power	Power switch	OFF		
	. . .	A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 26 LO---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 HI ---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed

Step	UNIT group	Item	Action/indication	Yes	No

◄NOTE►

1. Unless otherwise specified, all controls and indicators are located on Control Monitor front panel.
2. Refer to TM 9-4935-473-14-1, repair section for procedures to replace defective front panel components, defective cards, and defective subassemblies.
3. A logic HI is defined as a voltage level of 4.85 V ± 0.30 V. A logic LO is defined as a voltage level of 0.00 V ± 0.30 V. An OPEN circuit is defined as a resistance of 1 megohm or more. A short circuit is defined as a resistance of 10 ohms or less (0 on the 2 MEG scale).
4. Initial conditions as indicated in TM 9-4935-473-14-1 must be met before using these procedures.
5. These procedures are based on the assumption that the Control Monitor self-test procedures have been run and passed and the TMS checkouts are performed in sequence as indicated in TM 9-1425-473-34. System checkouts referred to in Action/ indication column are from TM 9-1425-473-34.
6. These procedures are also based on the assumption that TSGMS cables are not faulty.
7. Rerun the Control Monitor self-test procedures and TMS check-out procedures after replacing any component to verify that the fault is corrected.
8. Ensure that power is off when removing or installing any card or subassembly in the Control Monitor. Cards may be removed to read component designation and positions.
9. Unless otherwise specified, all voltages. OPEN and SHORT circuits indications are obtained and read on the Control Monitor DMM.

1	Cable W1	W1XP1-A, B,C to W1XP237-A,B,C respectively	Monitor		
	External DMM	Display	Less than 0.002K ohms	Go to step 2	Replace cable W1

CAUTION

Avoid bending pins when connecting the following cable.

2	Cable W1	W1XP1 to Control Monitor J1/ POWER connector	Connect		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
2 (cont)	Cable W1	W1XP237 to +28 volt power source	Connect		
	Control Monitor				
	Power	Power switch	PWR ON		
		PWR ON indicator	Lit	Go to step 3	Perform Control Monitor self-test procedure in TM 9-4935-473-14-1
3	DMM	MODE	DC		
		VOLTS/OHMS	200K/200V		
		CHANNEL SELECTOR	TEST LEADS		
	DMM test lead jack	Test leads	Connect		
	TARGET CONTROL	TARGET	PWR ON		
	J2	Pin A (HI) to pin D (LO)	+25.0 to +28. 5 V	Go to step 4	Replace Control Monitor
4	TARGET CONTROL	TARGET	OFF		
	DMM	MODE	OHMS		
		VOLTS/ OHMS	2 MEG		
		Display	OPEN when test leads are separated and SHORT when test leads are together	Go to step 5	Replace Control Monitor
5	DMM	MODE	DC		
		VOLTS/ OHMS	20K/20V		
	. . .	. . .	AUTOMATIC TEST TEST NUMBER 34 passed in Checkout Launch Constraints	Go to step 20	Go to step 6

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	AUTOMATIC TEST	TEST NUMBER	34		
	. . .	. . .	INDICATOR READY lit as indicated in Checkout Launch Constraints	Go to step 14	Go to step 7
7	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7 8, 9, 15, 17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN	Monitor		
	DMM	Display	LO---pin 11 LO---pin 6 LO--- pin 7 LO---pin 8 LO--- pin 9 LO---pin 15 LO---pin 17 LO---pin 16 HI ---pin 34 LO---pin 33 HI ---pin 32 LO---pin 31 HI ---pin 30 LO---pin 14 LO--- pin 13 LO--- pin 12 LO---pin 35 LO---pin 36 LO--- pin 37 LO---pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41	Go to step 9	Go to step 8
8	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
(cont)	DMM	Display	HI ---pin 2 HI ---pin 3 LO--- pin 4 LO---pin 5 LO---pin 18 LO---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
9	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45. 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 4 HI ---pin 45 LO--- pin 44 HI ---pin 43 LO--- pin 42 HI ---pin 40 LO---pin 16 HI ---pin 21 LO---pin 7 LO--- pin 32 HI ---pin 30	Go to step 11	Go to step 10
10	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 LO---pin 38 HI ---pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
11	Power	Power switch	OFF		
	. . .	A4 card	Extend using extender card (11499061)		
	Power	Power switch	PWR ON		
	A4 card	Pins 5 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Replace A10 card; if malfunction persists, replace Control Monitor	Go to step 12
12	A4 card	Pins 4 (HI) and 18 (RTN)	Monitor		
	DMM	Display	HI	Go to step 13	Replace A7 card; if malfunction persists, replace Control Monitor
13	A4 card	Pins 3 (HI) 18 (RTN)	Monitor		
	DMM	Display	HI	Replace A4 card	Replace A6 card; if malfunction persists, replace Control Monitor
14	. . .	. .	API 1 display shown -12.0 to -7.0 as indicated in Checkout Launch Constraints	Go to step 15	Replace A3 card; if malfunction persists, replace A4 card; if malfunction persists, replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
15	. . .	. . .	INDICATOR READY not lit as indicated in Checkout Launch Constraints	Go to step 16	Replace A7 card
16	. . .	. . .	INDICATOR IN TEST lit as indicated in Checkout Launch Constraints	Go to step 18	Go to step 17
17	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS4, DS6, DS7, DS11, DS14, DS15, DS16, DS17, DS19, DS20, and DS21	Lit	Replace All card; if malfunction persists, replace A13 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
18	. . .	. . .	ANGLE INDICATORS CONSTRAINTS VALID lit as indicated in Check out Launch Constraints	Go to step 20	Go to step 19
19	DMM	MODE	OHMS		
		VOLTS/OHMS	2 MEG		
	. . .	J3 pin GG (HI) to A4 card pin 8 (LO)	SHORT	Replace A4 card; if malfunction persists, replace A10 card	Replace Control Monitor
20	. . .	. . .	AUTOMATIC TEST TEST NUMBER 35 passed in Checkout Launch Constraints	Go to step 26	Go to step 21
21	AUTOMATIC TEST	TEST NUMBER	35		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		

Table 2-19. Checkout Launch Constraints Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
21 (cont)	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7,8, 9, 15, 17, 16, 34, 33, 32, 31, **30, 14,** 13, 12, 35, 36, 37,40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 11 LO---pin 6 LO--- pin 7 LO--- pin 8 LO--- pin 9 LO---pin 15 LO--- pin 17 LO---pin 16 HI ---pin 34 LO---pin 33 HI ---pin 32 HI ---pin 31 Lo ---pin 30 LO---pin 14 LO--- pin 13 LO---pin 12 LO--- pin 35 LO---pin 36 LO--- pin 37 LO--- pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41	Go to step 23	Go to step 22
22	A20 card	Pins 2, 3,4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 2 HI ---pin 3 LO---pin 4 LO--- pin 5 HI ---pin 18 LO---pin 19 HI ---pin 20 LO---pin 1	Replace A20 card	Replace Control Monitor
23	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
23 (cont)	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 4 HI ---pin 45 LO---pin 44 HI ---pin 43 LO--- pin 42 HI ---pin 40 LO---pin 16 HI ---pin 21 LO---pin 7 LO---pin 32 HI ---pin 30	Go to step 25	Go to step 24
24	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14, (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 HI ---pin 37 LO---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
25	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS2, DS3, DS5, DS8, DS9, DS10, DS11, DS13, DS17, DS21, DS22, DS23, and DS24	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
26	. . .	. . .	AUTOMATIC TEST TEST NUMBER 36 passed in Checkout Launch Constraints	Go to step 31	Go to step 27

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27	AUTOMATIC TEST	TEST NUMBER	36		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15, 17 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 11 LO- -- pin 6 LO- -- pin 7 LO- - -pin 8 LO---pin 9 LO- -- pin 15 LO---pin 17 LO- --pin 16 LO---pin 34 LO- -- pin 33 LO---pin 32 LO---pin 31 LO---pin 30 LO---pin 14 LO---pin 13 LO---pin 12 LO---pin 35 LO---pin 36 LO---pin 37 LO- --pin 40 LO---pin 39 HI ---pin 38 LO---pin 41	Go to step 29	Go to step 28
28	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
28 (cont)	DMM	Display	HI ---pin 2 HI ---pin 3 LO- -- pin 4 LO- -- pin 5 LO- -- pin 18 HI ---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
29	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO- -- pin 4 HI ---pin 45 LO- -- pin 44 LO- -- pin 43 LO- - -pin 42 HI ---pin 40 LO--- pin 16 LO---pin 21 LO- -- pin 7 LO- -- pin 32 HI ---pin 30	Replace Control Monitor	Go to step 30
30	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO- -- pin 28 LO- -- pin 29 LO- -- pin 37 HI ---pin 38 HI ---pin 39 LO--- pin 14	Replace A21 card	Replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
31	. . .	. . .	AUTOMATIC TEST TEST NUMBER 37 passed in Checkout Launch Constraints	Go to step 37	Go to step 32
32	AUTOMATIC TEST	TEST NUMBER	37		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15, 17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 11 LO---pin 6 LO--- pin 7 LO---pin 8 LO--- pin 9 LO---pin 15 LO--- pin 17 LO---pin 16 HI ---pin 34 LO--- pin 33 HI ---pin 32 HI ---pin 31 HI ---pin 30 LO--- pin 14 LO--- pin 13 LO--- pin 12 LO--- pin 35 LO---pin36 LO--- pin 37 LO--- pin 40 LO--- pin 39 HI ---pin 38 HI ---pin 41	Go to step 34	Go to step 33

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
33	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 2 HI ---pin 3 LO--- pin 4 LO--- pin 5 HI ---pin 18 HI ---pin 19 HI ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
34	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 4 HI ---pin 45 LO---pin 44 HI ---pin 43 LO--- pin 42 HI ---pin 40 LO---pin 16 HI ---pin 21 LO---pin 7 LO--- pin 32 HI ---pin 30	Go to step 36	Go to step 35
35	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO--- pin 28 LO---pin 29 HI ---pin 37 HI ---pin 38 HI ---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
36	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS4 , DS6, DS7, DS1l, DS14, DS15, DS16, DS21, and DS23	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
37	. . .	. . .	AUTOMATIC TEST TEST NUMBER 38 passed in Checkout Launch Constraints	Go to step 43	Go to step 38
38	AUTOMATIC TEST	TEST NUMBER	38		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15,17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO ---pin 11 LO ---pin 6 LO--- pin 7 LO--- pin 8 LO ---pin 9 LO ---pin 15 LO ---pin 17 LO ---pin 16 HI -- -pin 34 HI ---pin 33 LO--- pin 32 LO ---pin 31 LO--- pin 30 LO--- pin 14 LO ---pin 13 Lo ---pin 12 LO ---pin 35 LO ---pin 36	Go to step 40	Go to step 39

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
38 (cont)			LO--- pin 37 LO---pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41		
39	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, l (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 2 HI ---pin 3 LO---pin 4 LO---pin 5 LO---pin 18 LO--- pin 19 LO---pin 20 HI ---pin 1	Replace A20 card	Replace Control Monitor
40	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (l1499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44,43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 4 HI ---pin 45 LO---pin 44 HI ---pin 43 LO---pin42 HI ---pin 40 LO---pin 16 LO---pin 21 LO--- pin 7 LO---pin 32 HI ---pin 30	Go to step 42	Go to step 41

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
41	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14, (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 LO---pin 37 LO---pin 38 LO---pin 39 HI ---pin 14	Replace A21 card	Replace Control Monitor
42	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS3 , DS4 , DS5, DS12, DS14 , DS15 DS17, DS19 DS20, and DS21	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
43	. . .	. . .	AUTOMATIC TEST TEST NUMBER 39 passed in Checkout Launch Constraints	Go to step 49	Go to step 44
44	AUTOMATIC TEST	TEST NUMBER	39		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15 17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI) and 24 (RTN)	Monitor		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
4 4 (cont)	DMM	Display	LO---pin 11 LO---pin 6 LO---pin 7 LO---pin 8 LO--- pin 9 LO---pin 15 LO---pin 17 LO---pin 16 HI ---pin 34 HI ---pin 33 LO---pin 32 LO---pin 31 HI ---pin 30 LO---pin 14 LO---pin 13 LO---pin 12 LO---pin 35 LO---pin 36 LO---pin 37 LO---pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41	Go to step 46	Go to step 45
45	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 2 HI ---pin 3 LO---pin 4 LO---pin 5 HI ---pin 18 LO---pin 19 LO---pin 20 HI ---pin 1	Replace A20 card	Replace Control Monitor
46	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original posit ion		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
4 6 (cont)	DMM	Display	LO --- pin 4 HI ---pin 45 LO---pin 44 HI ---pin 43 LO--- pin 42 HI ---pin 40 HI ---pin 16 LO---pin 21 LO--- pin 7 LO---pin 32 HI ---pin 30	Go to step 48	Go to step 47
47	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	HI ---pin 26 HI ---pin 27 LO---pin 28 LO---pin 29 HI ---pin 37 LO---pin 38 LO---pin 39 HI ---pin 14	Replace A21 card	Replace Control Monitor
48	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS4 , DS6, DS7, DS11, DS14, DS15, DS16, DS17, DS18, DS19, DS22, DS23, and DS24	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
49	. . .	. . .	AUTOMATIC TEST TEST NUMBER 40 passed in Checkout Launch Constraints	Go to step 55	Go to step 50
50	AUTOMATIC TEST	TEST NUMBER	**40**		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
50 (cont)	A20 card	Pins 11, 6, 7, 8, 9, 15, 17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 11 LO--- pin 6 LO---pin 7 LO---pin 8 LO--- pin 9 LO---pin 15 LO---pin 17 LO---pin 16 HI ---pin 34 HI ---pin 33 LO---pin 32 HI ---pin 31 LO---pin 30 LO---pin 14 LO---pin 13 LO---pin 12 LO---pin 35 LO---pin 36 LO---pin 37 LO---pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41	Go to step 52	Go to step 51
51	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO--- pin 3 HI ---pin 4 LO---pin 5 LO---pin 18 LO---pin 19 LO---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor
52	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
5 2 cont)	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32, 30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 4 HI ---pin 45 LO---pin 44 HI ---pin 43 LO---pin 42 HI ---pin 40 HI ---pin 16 LO---pin 21 LO---pin 7 LO---pin 32 HI ---pin 30	Go to step 54	Go to step 53
53	A21 card	Pins 26, 27, 28, 29, 37, 38, 39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO---pin 26 LO---pin 27 HI ---pin 28 Lo---pin 29 LO---pin 37 LO---pin 38 LO---pin 39 LO---pin 14	Replace A21 card	Replace Control Monitor
54	A12 card	Z1 segment 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emit diodes DS1 DS4 , DS6 DS7, DS11 DS14, DS15 DS16, DS17 DS19, DS20 DS21 and DS22	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor
55	. . .	. . .	AUTOMATIC TEST TEST NUMBER 41 passed in Checkout Launch Constraints	Control Monitor is not faulty	Go to step 56

Table 2-19. Checkout Launch Constraints Failed - Continued

Step	UNIT group	Item	Action/indication	Yes	No
56	AUTOMATIC TEST	TEST NUMBER	41		
	Power	Power switch	OFF		
	. . .	Back panel	Remove		
		A20 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A20 card	Pins 11, 6, 7, 8, 9, 15, 17, 16, 34, 33, 32, 31, 30, 14, 13, 12, 35, 36, 37, 40, 39, 38, 41 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 11 LO--- pin 6 LO---pin 7 LO---pin 8 LO--- pin 9 LO---pin 15 LO---pin 17 LO---pin 16 HI ---pin 34 HI ---pin 33 LO ---pin 32 HI ---pin 31 HI ---pin 30 LO---pin 14 LO---pin 13 LO---pin 12 LO---pin 35 LO--- pin 36 LO---pin 37 LO--- pin 40 LO---pin 39 HI ---pin 38 HI ---pin 41	Go to step 58	Go to step 57
57	A20 card	Pins 2, 3, 4, 5, 18, 19, 20, 1 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 2 LO---pin 3 HI ---pin 4 LO ---pin 5 HI ---pin 18 LO ---pin 19 LO ---pin 20 LO--- pin 1	Replace A20 card	Replace Control Monitor

Table 2-19. Checkout Launch Constraints Failed- Continued

Step	UNIT group	Item	Action/indication	Yes	No
58	Power	Power switch	OFF		
	. . .	A20 card	Reinstall in original position		
		A21 card	Extend using extender card (11499064)		
	Power	Power switch	PWR ON		
	A21 card	Pins 4, 45, 44, 43, 42, 40, 16, 21, 7, 32,30 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO-- -pin 4 HI ---pin45 LO---pin44 HI ---pin43 LO---pin42 HI ---pin40 LO--- pin 16 LO--- pin 21 LO---pin 7 LO--- pin 32 HI ---pin30	Goto step 60	Goto step 59
59	A21 card	Pins 26, 27, 28, 29, 37, 38,39, 14 (HI), and 24 (RTN)	Monitor		
	DMM	Display	LO--- pin 26 LO---pin 27 HI ---pin 28 LO---pin29 HI ---pin37 LO---pin38 LO---pin39 LO--- pin 14	Replace A21 card	Replace Control Monitor
60	A12 card	Z1 segments 1 and 2	ON		
	AUTOMATIC TEST	RESET	Press and release		
	A12 card	Light emitting diodes DS1, DS4, DS6, DS7, DS11, DS14, DS15, DS16, DS17, DS20, DS22 and DS24	Lit	Replace A11 card; if malfunction persists, replace Control Monitor	Replace A12 card; if malfunction persists, replace Control Monitor

Table 2-20. TSEM Self-Test Troubleshooting Procedure

Step	UNIT group	Item	Action/indication	Yes	No
			◄NOTE►		
	Tag TSEM for calibration team whenever any circuit card is replaced.				
	Whenever pressing TSEM RESET switch, wait 15 seconds after performing previous switch setting; then press TSEM RESET switch.				
1	TSEM				
	Control panel	Function rotary switch	AUTO		
		RESET	Press and release		
		START and PREFIRE indicators	Not lit	Go to step 2	Go to step 30
2	Control panel	YAW and PITCH indicators	Not lit	Go to step 3	Go to step 9
3	Control panel	FIRE indicator	Not lit	Go to step 4	Go to step 45
4	Control panel	MSL GONE indicator	Not lit	Go to step 5	Replace A1 card; if malfunction persists, replace TSEM
5	Control panel	WIRE SIGNAL -12, and ZERO indicators	Not lit	Go to step 6	Go to step 47
6	Control panel	WIRE CUT indicator	Not lit	Go to step 7	Go to step 53
7	Control panel	SQUIB DISC indicator	Not lit	Go to step 8	Go to step 55
8	Control panel	SHEAR PIN indicator	Not lit	TSEM is not faulty	Go to step 58
9	Control panel	Power switch	OFF		
	Cable W8	W8P1 to MONITOR of TSEM	Connect		
		W8P2 to J2 of SIGNAL MONITOR	Connect		
	Control panel	Power switch	ON		

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
9 (cont)	Scope	VOLTS/DIV	5		
		TIME/DIV	1 MSEC		
	SIGNAL MONITOR	Pins Z, a (HI) and i (RTN)	Monitor		
	Scope	Display	+11 v (approx) --- pin Z +11 v (approx) --- pin a	Go to step 36	Replace A3 card; if malfunc - tion per- sists, replace TSEM

N O T E

Ensure that TSEM function rotary switch is set to MSL I/F before continuing.

10	TSEM Control panel	START and PRE FIRE indicators	Lit	Go to step 11	Go to step 68
11	Control panel	YAW indicator	Lit	Go to step 12	Go to step 19
12	Control panel	PITCH indicator	Lit	Go to step 13	Go to step 77
13	Control panel	FIRE indicator	Lit	Go to step 14	Replace A1 card; if malfunc - tion per- sists, replace TSEM
14	Control panel	MSL GONE indicator	Lit	Go to step 15	Replace A1 card; if malfunc - tion per- sists, replace TSEM
15	Control panel	WIRE SIGNAL -12 and ZERO indicators	Lit	Go to step 16	Replace A7 card; if malfunc - tion per- sists, replace TSEM

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16	Control panel	WIRE CUT indicator	Lit	Go to step 17	Replace A2 card; if malfunction persists, replace TSEM
17	Control panel	SQUIB DISC	Lit	Go to step 18	Replace A2 card; if malfunction persists, replace A1 card; if malfunction persists, replace TSEM
18	Control panel	SHEAR PIN indicator	Not lit	TSEM is not faulty	Replace A8 card; if malfunction persists, replace TSEM
19	Control panel	Power switch	OFF		
	Cable W8	W8P1 to MONITOR of TSEM	Connect		
		W8P2 to J2 of SIGNAL MONITOR	Connect		
	Control panel	Power switch	ON		
	. . .	coaxial cable	Connect to Counter/ Timer B input DC and SIGNAL MONITOR pins Z (HI) and i (RTN)		
	Counter/Timer				
	B Input	SLOPE	-		
	C Input	SLOPE	+		
	. . .	SEP-COM switch	COM		
	B Input	TRIGGER MULTI-PLIER	3		
		TRIGGER LEVEL CONTROL	Adjust for stable count		

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
19 (cont)	. . .	FUNCTION	TIME B-C		
		GATE TIME (SEC $^{-1}$)	10^4		
		DISPLAY	∞		
	TSEM				
	Control panel	Function rotary switch	SP "GO"		
		RESET	Press and release		
	Counter/Timer	RESET	Press and release		
	Control panel	Function rotary switch	MSL I/F		
	Counter/Timer	Display	198 to 242 msec	Go to step 20	Go to step 24
20	. . .	coaxial cable	Connect to Counter/ Timer B input DC and SIGNAL MONITOR pins a (HI) and i (RTN)		
	TSEM				
	Control panel	Function rotary switch	SP "GO"		
		RESET	Press and release		
	Counter/Timer	RESET	Press and release		
	TSEM				
	Control panel	Function rotary switch	MSL I/F		
	Counter/Timer	Display	225 to 275 msec	Go to step 27	Go to step 21
21	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A3 card	Extend using extender card (11499235)		
	Control panel	Power switch	ON	Go to step 22	

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
22	Control panel	Function rotary switch	3P "GO"		
		RESET	Press and release		
	Counter/Timer	RESET	Press and release		
	TSEM				
	control panel	Function rotary switch	MSL I/F		
	A3 card	R9	Adjust		
	Counter/Timer	Display	225 to 275 msec	TSEM is not faulty	Go to step 23
23	. . .	. . .	Repeat step 22 as many times as necessary to obtain Counter/Timer indication	TSEM is not faulty	Replace A3 card
24	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A3 card	Extend using extender card (11499235)		
	Control panel	Power switch	ON	Goto step 25	. . .
25	Control panel	Function rotary switch	SP "GO"		
		RESET	Press and release		
	Counter/Timer	RESET	Press and release		
	TSEM				
	Control panel	Function rotary switch	MSL I/F		
	A3 card	R7	Adjust		
	Counter/Timer	Display	198 to 242 msec	TSEM is not faulty	Go to step 26
26	. . .	. . .	Repeat step 25 as many times as necessary to obtain Counter/Timer indication	TSEM is not faulty	Replace A3 card

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
27	Scope	VOLTS/DIV	2		
		TIME/DIV	2 sec		
	SIGNAL MONITOR	Pin Y (HI) to pin (RTN)	Monitor		
	TSEM				
	Control panel	Function rotary switch	SP "GO"		
		RESET	Press and release		
		Function rotary switch	MSL I/F		
	Scope	Display	Momentary pulses in the following sequence: Positive voltage --- greater than 2.5 V Negative voltage --- more negative than -2.5v Positive voltage --- greater than 1.0V Negative voltage --- more negative than -1.0 v Zero voltage	Replace A4 card; if malfunction persists, replace TSEM	Go to step 28
28	TSEM				
	Control panel	Power switch	OFF		
	• • •	Bottom panel	Remove		
		A9 card	Elxtend using extender card (11499235)		
	Control panel	Power switch	ON		
		RESET	Press and release		
	Scope	VOLTS/DIV	10		
		TIME/DIV	0.5 msec		
	• • •	A9 card TP3 (HI) and SIGNAL MONITOR (RTN)	Monitor		
	Scope	Display	Composite wave form of 37 to 40 Vp-p having a sine wave of 7 to 10 Vp-p	Go to step 75	10 to step 71

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
29	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A8 card	Extend using extender card (11499235)		
	Cable W8	W8P1 to Monitor of TSEM	Connect		
		V8P2 to J2 of SIGNAL MONITOR	Connect		
	Control panel	Power switch	ON		
	A8 card	Pins 24 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	14.0 to +16.0 V	Go to step 62	Replace A8 card
30	TSEM				
	Control panel	power switch	OFF		
	. . .	Bottom panel	Remove		
		A1 card	Extend using extender card (11499235)		
		power switch	ON		
	A1 card	Pins 22 (HI) and 7 (RTN)	Monitor		
	Control panel	RESET	press and hold		
	External DMM	Display	Greater than +10 Vdc		Replace TSEM
	TSEM				
	Control panel	RESET	Release	Go to step 31	
31	A1 card	Pins 5 (HI) and 3 (RTN]	Monitor		
	External DMM	Display	Less than +2 Vdc	Go to step 32	Go to step 35
32	TSEM				
	A1 card	Pins 6 (HI) and 3 (RTN	Monitor		
	External DMM	Display	Greater than +15 Vdc	Go to step 34	Go to step 33

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
33	TSEM				
	A 1 card	Pins 20 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	Greater than +15 Vdc	Go to Step 34	Replace TSEM
34	TSEM				
	A1 card	R1	Adjust until PREFIRE indicator extinguishes		
	Control panel	PREFIRE indicator	Extinguished	Calibrate TSEM	Replace A1 card
35	TSEM				
	Control panel	Power switch	OFF		
		A1 card	Remove with extender card (11499235), remove from extender card and reinstall A1 card to TSEM		
		A8 card	Extend using extender card (11499235)		
		Power switch	ON		
		RESET	Press and release		
	A8 card	Pins 8 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Replace A8 card
36	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A4 card	Extend using extender card (11499235)		
		Power switch	ON		
	A4 card	Pins 18 (HI) and 7 (RTN)	Monitor		
	Control panel	RESET	Press and hold		
	External DMM	Display	Greater than +10 Vdc		Replace TSEM
	TSEM				
	Control panel	RESET	Release	Go to Step 37	

Table 2-20. TSEM Self-Test Troubleshooting Procedure -Continued

Step	UNIT group	Item	Action/indication	Yes	No
37	A4 card	Test points 1 (HI) and 5 (RTN)	Monitor		
	External DMM	Display	-2.41 to -2.39 Vdc	Go to step 39	Go to step 38
38	TSEM				
	A4 card	R7	Adjust for an external DMM indication of -2.40 ± 0.01 Vdc		
	External DMM	Display	-2.41 to -2.39Vdc	Calibrate TSEM	Replace A4 card
39	TSEM				
	A4 card	Test points 2 (HI) and 5 (RTN)	Monitor		
	External DMM	Display	-0.51to -0.49Vdc	Go to step 41	Go to step 40
40	TSEM				
	A4 card	R8	Adjust for an external DMM indication of -0.50 ±0.01 Vdc		
	External DMM	Display	-0.51 to -0.49 Vdc	Calibrate TSEM	Replace A4 card
41	TSEM				
	A4 card	Test points 3 (HI) and 5 (RTN)	Monitor		
	External DMM	Display	-2.41 to -2.39 Vdc	Go to step 43	Go to step 42
42	TSEM				
	A4 card	R9	Adjust for an external DMM indication of -2.40 ± 0.01 Vdc		
	External DMM	Display	-2.41 to -2.39 Vdc	Calibrate TSEM	Replace A4 card
43	TSEM				
	A4 card	Test points 4 (HI) and 5 (RTN)	Monitor		
	External DMM	Display	-0.51 to -0.49 Vdc	Replace A4 card	Go to step 44

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
44	TSEM				
	A4 card	R10	Adjust for an external DMM indication of -0.50 ±0. 01 Vdc		
	External DMM	Display	-0.51 to -0.49 Vdc	Calibrate TSEM	Replace A4 card
45	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom cover	Remove		
		A1 card	Extend using extender card (11499235)		
		Power switch	ON		
		RESET	Press and release		
	A 1 card	Pins 35 (HI) and 33 (RTN)	Monitor		
	External DMM	Display	Less than +2 Vdc	Go to step 46	Replace TSEM
46	TSEM				
	A1 card	R15	Adjust until FIRE indicator extinguishes		
	Control panel	FIRE indicator	Extinguished	Calibrate TSEM	Replace A1 card
47	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom cover	Remove		
		A7 card	Extend using extender card (11499235)		
		Power switch	ON		
	A7 card	Pins 4 (HI) and 7 (RTN)	Monitor		
	Control panel	RESET	Press and hold		
	External DMM	Display	Greater than +10 Vdc		Replace TSEM
	TSEM				
	Control panel	RESET	Release	Go to step 48	
48	Control panel	WIRE SIGNAL, -12, and ZERO indicators	All lit	Replace A5 card	Go to step 49

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
49	Control panel	WIRE SIGNAL indicator	Lit	Go to step 50	Go to step 51
50	A7 card	R13	Adjust until WIRE SIGNAL indicator extinguishes		
	Control panel	WIRE SIGNAL indicator	Extinguished	Calibrate TSEM	Replace A7 card
51	Control panel	-12 indicator	Lit	Go to step 52	Calibrate TSEM; if malfunction persists, replace A7 card
52	A7 card	R15	Adjust until -12 indicator extinguishes		
	Control panel	-12 indicator	Extinguished	Calibrate TSEM	Replace A7 card
53	TSEM				
	Control panel	Power switch	OFF		
		Bottom panel	Remove		
		A2 card	Extend using extender card (11499235)		
		Power switch	ON		
	A2 card	Pins 8 (HI) and 7 (RTN)	Monitor		
	Control panel	RESET	Press and hold		
	External DMM	Display	Greater than +10 Vdc		Replace TSEM
	TSEM				
	Control panel	RESET	Release	Go to step 54	
54	A2 card	R12	Adjust until WIRE CUT indicator extinguishes		
	Control panel	WIRE CUT indicator	Extinguished	Calibrate TSEM	Replace A2 card
55	TSEM				
	Control panel	Power switch	OFF		
		Bottom panel	Remove		
		A2 card	Extend using extender card (11499235)		

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
55 (cont)	TSEM (cont)				
		Power switch	ON		
	A2 card	Pins 33 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	-13 Vdc	Replace TSEM	Go to step 56
56	TSEM				
	A2 card	Pins 34 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	-13 Vdc	Replace TSEM	Go to step 57
57	TSEM				
	A2 card	Pins 35 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	-13 Vdc	Replace TSEM	Replace A2 card
58	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A8 card	Extend using extender card (11499235)		
		Power switch	ON		
	External DMM	Test leads	Connect between R21 (HI) and pin 7 (RTN) of A8 card		
		Display	Greater than +5 Vdc	Go to step 60	Go to step 59
59	TSEM				
	A8 card	R8 and R14	Adjust alternately until external DMM indicates greater than +5 Vdc		
	External DMM	Display	Greater than +5 Vdc	Calibrate TSEM	Replace A8 card
60	External DMM	Test leads	Connect between R22 (HI) and pin 7 (RTN) of A8 card		
		Display	Greater than +5 Vdc	Replace A8 card	Go to step 61

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
61	TSEM				
	A8 card	R15 and R16	Adjust alternately until external DMM indicates greater than +5 Vdc		
	External DMM	Display	Greater than +5 Vdc	Calibrate TSEM	Replace A8 card
62	TSEM				
	A8 card	Pins 26 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	-16.0 to -14.0 V	Go to step 63	Replace A8 card
63	TSEM				
	A8 card	Pins 10 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Go to step 64
64	TSEM				
	A8 card	TP1 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	External DMM	Display	-0.008 to +0. 008 Vdc	Replace A8 card	Go to step 65
65	TSEM	Transducer core rod	Adjust transducer core rod (3/8 inch hex nut located beneath shear pin platform) for an external DMM indication of 0.000 ±0. 008 Vdc		
	External DMM	Display	-0.008 to +0. 008 Vdc	Calibrate TSEM	Replace TSEM
66	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom panel	Remove		
		A8 card	Extend using extender card (11499235)		
		Power switch	ON		
	A8 card	Pins 10 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Go to step 67

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
67	TSEM				
	A8 card	R2	Adjust until SHEAR PIN indicator illuminates		
	Control panel	SHEAR PIN indicator	Lit	Calibrate TSEM	Replace TSEM
68	TSEM				
	Control panel	Power switch	OFF		
	. . .	Bottom cover	Remove		
		A1 card	Extend using extender card (11499235)		
		Power switch	ON		
		RESET	Press and release		
	A1 card	Pins 5 (HI) and 3 (RTN)	Monitor		
	External DMM	Display	Greater than ±16 Vdc	Replace A1 card	Go to step 69
69	TSEM				
	Control Panel	Power switch	OFF		
		A1 card	Remove with extender card (11499235); remove from extender card and reinstall A1 card to TSEM		
		A8 card	Extend using extender card (11499235)		
		Power switch	ON		
		RESET	Press and release		
	A8 card	Pins 8 (HI) and 7 (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Go to step 70	Replace TSEM
70	TSEM				
	Control panel	Power switch	OFF		
	. . .	A8 card	Remove from extender card (11499235)		
	Extender card	Pins 3 to 7	Monitor		

Table 2-20. TSEM Self-Test Troubleshooting Procedure -Continued

Step	UNIT group	Item	Action/indication	Yes	No
70 (cont)	External DMM	Display	Continuity	Replace A8 card	Reinstall A8 card and replace TSEM
71	TSEM				
	A9 card	Pin 6 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	Scope	Display	Timing pulses with an amplitude of 10 V	Go to step 72	Go to step 73
72	TSEM				
	A9 card	Pin 8 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Replace A9 card
73	TSEM				
	Control panel	Power switch	OFF		
		A9 card	Remove from extender card (11499235) and reinstall A9 card to TSEM		
		A3 card	Extend using extender card (11499235)		
		Power switch	ON		
	A3 card	Pin 4 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace A3 card	Go to step 74
74	TSEM				
	Control panel	Power switch	OFF		
		A3 card	Remove from extender card (11499235) and reinstall A3 card to TSEM		
		A1 card	Extend using extender card (11499235)		
		Power switch	ON		

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
74 (cont)	A1 card	Pin 19 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Replace A1 card
75	TSEM				
	Control panel	Power switch	OFF		
		A9 card	Remove from extender card (11499235) and reinstall A9 card to TSEM		
		A5 card	Extend using extender card (11499235)		
		Power switch	ON		
	A5 card	Pin 8 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	External DMM	Display	Greater than +10 Vdc	Replace TSEM	Go to step 76
76	TSEM				
	A5 card	Pin 12 (HI) and SIGNAL MONITOR i (RTN)	Monitor		
	Scope	Display	Composite wave form of 18 to 20 Vp-p	Replace A6 card	Replace A5 card
77	Control panel	Power switch	OFF		
	Cable W8	W8P1 to MONITOR of TSEM	Connect		
		W8P2 to J2 of SIGNAL MONITOR	Connect		
	Control panel	Power switch	ON		
	Scope	VOLTS/DIV	2		
		TIME/DIV	2 sec		
	SIGNAL MONITOR	Pin V (HI) to pin i (RTN)	Monitor		

Table 2-20. TSEM Self-Test Troubleshooting Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
77 (cont)	TSEM				
	Control panel	Function rotary switch	SP "GO"		
		RESET	Press and release		
		Function rotary switch	MSL I/F		
	scope	Display	Momentary pulses in the following sequence: Positive voltage --- greater than l.5V Negative voltage --- more negative than -1.5V Positive voltage --- greater than $0_{0}5$ V Negative voltage --- more negative than -0.5 V Zero voltage	Replace A4 card	Replace A5 card

Table 2-21. IRTA Adjustment Procedure

Step	UNIT group	Item	Action/indication	Yes	No
	◀ NOTE ▶ Number in parenthesis ( ) after electrical equipment corresponds to item No. in table 2-2.1.				
1	W2 cable	W2XP1 connector	Connect to IRTA connector J1		
		W2XP2 connector	Connect to MCU rear TARGET connector J2		
	Control Monitor				
	Power	Power switch	PWR ON		
	TARGET CONTROL	Target selector	CTR		
		TARGET	PWR ON		
	AUTOMATIC TEST	TEST NUMBER	03		
	TARGET CONTROL	LEVEL control	Fully ccw		
	Counter (31), electrical lead 8 and adapters 5 and 6	. . .	Connect counter (3) to IRTA IR source modulator card TP-7 (HI) and TP-3 (LO) with electrical lead (8) using adapters (5 and 6)		
	Counter (3)	Display	Indicates 1.67 x F_0 ± 1% (See drawing 10189614 for F_0)	Go to step 3	Go to step 2
2	IRTA				
	IR source modulator card	R22	Adjust for counter (3) indication of 1.67 x F_0	Go to step 3	Replace IR source modulator card

Table 2-21. IRTA Adjustment Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
3	Control Monitor				
	TARGET CONTROL	Target selector	OFF		
	IRTA				
	IR source modulator card	. . .	Disconnect electrical lead from TP-7 and TP-3		
	TARGET CONTROL	LEVEL control	Fully ccw		
	DMM	VOLTS/ OHMS	20K/20V		
		MODE	DC FILTER		
		CHANNEL SELECTOR	LOG H		
	AUTOMATIC TEST	TEST NUMBER	03		
	DMM	Display	Indicates +1. 900 to +2. 100 v	Go to step 4	Go to step 5
4	TARGET CONTROL	LEVEL control	Fully cw		
	DMM	Display	Indicates -2.100 to -1.900 v	Go to step 16	Go to step 5
5	Control Monitor				
	TARGET CONTROL	Target selector	OFF		
		LEVEL control	Fully ccw		
	IRTA				
	IR source modulator card	. . .	Connect TP-2 to TP-3 with electrical lead (8) using adapters (5 and 6)		
	Multimeter (2), electrical lead (4), and adapters (7)	. . .	Connect multimeter (2) to IRTA IR source modulator card TP-6 (HI) and TP-3 (LO) with electrical lead (4) and adapters (7)		
	Multimeter (2)	Meter	Indicates -0.001 to +0.001 v	Go to step 7	Go to step 6

Table 2-21. IRTA Adjustment Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
6	IRTA IR source modulator card	R14	Adjust for multimeter (2) indication of -0.001 to +0. 001 v	Go to step 7	Replace IR source modulator card
7	IRTA IR source modulator card		Disconnect electrical lead (4) from TP-6 (HI) and connect to TP-1 (HI)		
		NORM/TEST	TEST		
	Multimeter (2)	Meter	Indicates -0.001 to +0. 001 v	Go to step 9	Go to step 8
8	IRTA IR source modulator card	R36	Adjust for multimeter (2) indication of -0.001 to +0. 001 v	Go to step 9	Replace IR source modulator card
9	IRTA IR source modulator card	NORM/TEST	NORM		
			Disconnect electrical lead (4) from TP-1 (HI) and connect to TP-8 (HI).		
	Multimeter (2)	Meter	Indicates -0.009 to -0.005 v	Go to step 11	Go to step 10
10	IRTA IR source modulator card	R33	Adjust for an multimeter (2) indication of -0.009 -0.005 v	Go to step 11	Replace IR source modulator card

Table 2-21. IRTA Adjustment Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
11	IRTA				
	IR source modulator card		Disconnect electrical lead (8) from TP-2 and TP-3		
	Oscilloscope (l), electrical leads (8 and 9), and adapters (5 and 6		Connect oscilloscope (1) to TP-2 (HI) and TP-3 (LO) on IR source modulator card of IRTA with electrical leads (8 and 9) and adapters (5 and 6)		
	Control Monitor				
	TARGET CONTROL	Target selector	CTR		
	Oscilloscope (1)	Display	Indicates 0.010 to 0.030 v p-p square wave	Go to step 13	Go to step 12
12	Control Monitor				
	TARGET CONTROL	LEVEL control	Fully ccw		
	IRTA				
	IR source modulator card	R33	Adjust for amplitude of 0.010 v p-p square wave on oscilloscope (1) as shown below	Go to step 13	Replace IR source modulator card

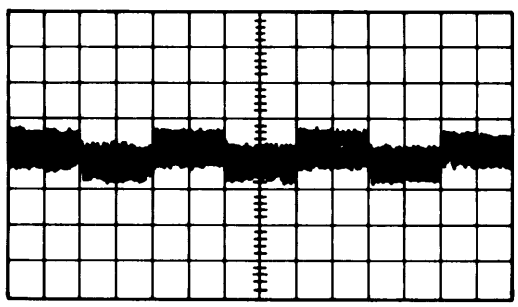


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Table 2-21. IRTA Adjustment Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
13	Control Monitor				
	TARGET CONTROL	LEVEL control	Adjust slowly cw		
	Oscilloscope (1)	Display	Observe square wave amplitude increase without discontinuity	Go to step 14	Replace control monitor
14	Control Monitor				
	TARGET CONTROL	LEVEL control	Fully CW		
	Multimeter (2) and IRT A IR source modulator card		Connect multimeter (2) to IRTA IR source modulator card TP-2 (HI) and TP-3 (LO) with electrical lead (4) and adapters (7)		
	Multimeter (2)	Meter	Indicates +2. 57 to +3. 13 v	Go to step 16	Go to step 15
15	IRTA				
	IR source modulator card	R25	Adjust for +2. 57 to +3. 13 v reading on multimeter (2)	Go to step 16	Replace IR source modulator card
16	Control Monitor				
	Power	Power switch	OFF		
	TARGET CONTROL	Target selector	OFF		
		TARGET	OFF		
		Level control	Fully CCW		
	DMM	VOLTS/ OHMS	OFF		
		MODE	DC		
		CHANNEL SELECTOR	DISCONNECT		
	AUTOMATIC TEST	TEST NUMBER	00		

Table 2-21. IRTA Adjustment Procedure - Continued

Step	UNIT group	Item	Action/indication	Yes	No
16 (Cont)	A1l applicable test equipment		Power off		
	Electrical leads and adapters		Disconnect from IRTA IR source modulator card		
	W2 Cable	W2XP1 connector	Disconnect		
		W2XP2 connector	Disconnect		

CHAPTER 3

EQUIPMENT OPERATION THEORY

3-1. General.

The information contained in this paragraph applies to the description of all major block and functional areas as related to the associated book and functional diagrams. Specific items relating to a particular major component are explained in the paragraphs covering that particular component.

a. Functional Arrangements. The TSGMS is divided into two major functional areas: Control Moni - tor and TSEM. 'The block and functional diagrams with associated theory for the control monitor are covered in paragraphs 3-2 and 3-3. The block and functional diagrams with associated theory for the TSEM are covered in paragraphs 3-4 and 3-5.

b. Coded Lines on Illustrations. Coded lines (solid lines or dash lines) are used to indicate hardware boundaries of major equipment and circuit cards within the major components.

c. Grid Zones on Illustrations. Grid zones are included on all circuit diagrams to provide reference locations for input and output signals. The grid zones consist of an alphabetical designation from top to bot - tom along the left margin of the page, and a numerical designation from left to right across the top of the page. On multiple-sheet diagrams the numerical grid zone designation is continuous from the first sheet through the last sheet.

d. Interdiagram Referencing of Signals. A11 input signals to a diagram and all output signals from a dia - gram are identified by a signal name as well as a signal code. The input signal codes and origin informs - tion are contained in an input table, together with reference to figure and grid zones where the signals are applied, The output signal codes and destination information are contained in an output table, together with reference to figure and grid zones where the signals are developed. The signal codes are shown both on the diagrams and the input/output tables. The signal codes in the input/output tables are arranged in alphanumeric order. Input /output signals within a figure are not listed in the input/output tables.

e. Functional Description Diagrams. The func - tion diagrams and the associated text provide an overall description of each major function. Each diagram illustrates the physical-functional relationship of the equipment and lists the schematic title on which different portions of the equipment are covered. The physical-functional relationship is indicated by coded lines that surround the functional diagrams.

3-2. Control Monitor General Operation Theory.

The following Control Monitor general operation theory groups are keyed to corresponding areas on the block diagram (figure 3-1) by use of a white letter placed over a hexagonal symbol, i.e., (A)

(A) Automatic Test Group - Performs test sequences determined by positioning the TEST NUMBER switch. BCD commands from this switch are applied to ROM's in the test encoder modules to develop BCD select and control signals. Signals from the system under test are compared with reference signals in the comparator and processor circuits to test for accuracy and compliance with predetermined parameters. Memory data from ROM's is used to set limits of a window comparator, activate signal processor circuits, and provide stimuli signals to the system under test. Signals from the comparator and processor circuits are then applied to pass /fail driver circuits to generate excitation for pass or fail indicators as determined by results of tests performed.

(B) Target Control Group - Provides control of an IR target source that simulates a launched missile. The IR target source simulates a missile having an up, down, left, or right error. The IR target source also simulates a missile having no error (target in center). Target control is determined automatically from commands generated in the automatic test group or manually by commands from the target selector switch. These commands control circuitry in the master timer module that, in turn, controls a modulator in the IRTA. The modulator provides excitation to IR diodes. These diodes produce an infrared signal that is seen by the svstem under test as an IR target. Intensity of the IR target source is determined by target level sig - nals from the level control potentiometer. M65 with C-NITE system under test uses the left diode for an IR target and a thermal patch for a hot target. Both the left diode and thermal patch are activated by the power adapter.

(C) Boresight Group - Provides capability for MCU operator control of boresight drive motors in the system under test. Bore - sight position signals from the AZ and EL switches are applied to the system under test to provide this capability.

(D) Timer Interrupt Group - Provides an indication of timer progress in the system under test. The timer interrupt group also stops this timer at a time selected by the timer interval switch. Program timing signals from the system under test are applied to a processor in the timer interrupt group. The processor then provides excitation to the proper timer interrupt indicators. A signal from the START switch causes the timer in the system under test to count. This

timer then stops at a time selected on the timer interval switch. The timer interrupt group does not affect the system under test when timer interval switch is set to RUN.

(E) Counter/Timer Group – Displays values of frequency or time interval measured during test procedures. Frequency signals are measured in Hz or kHz and time intervals are measured in seconds or milliseconds. Timing signals are selected from the timer interrupt group or automatic test group; frequency signals are selected from the system under test or circuits in the counter/timer group. The selected signal is applied through enable gates to data strobe and reset circuits. A reset signal from the RESET switch in the automatic test group is also applied to this circuit. The data strobe from data strobe and reset circuit updates information in the accumulator and display driver. This information is then applied to the counter/timer display. The reset signal sets the accumulator to zero when the RESET switch is pressed.

(F) Manual Controls Group – Provides operator control of the system under test. Various MCA signals from the system under test may be disabled by manual control switches. Gimbal angles and boresight positions maybe selected manually. The system under test may also be turned on remotely by use of the REMOTE ON COMMAND switch. An auto signal from the AUTO/MANUAL switch in the automatic test group removes manual control capability.

(G) Power Group – Provides various voltages necessary to operate the control monitor. Plus 28 V is applied through the POWER switch to the control monitor power supply. Necessary voltages are generated in the power supply and routed to all functions of the control monitor.

(H) Gyro Group – Provides simulated pitch and roll information to the system under test and to the angle indicators group. Ac pitch and roll signals, whose phase and amplitude are dependent on the position of the PITCH and ROLL control knobs, are supplied from pitch and roll synchros.

(I) Angle Indicators Group – Displays gimbal and P angles from the system under test. The indicators also display simulated signals selected manually. Various input signals are applied through the angle indicators mode switches to the analog to digital converter, Pitch and roll output signals from the converter are then applied to the API 1 and API 2 displays.

(J) TSU Gimbal Group – Provides manual track stick commands to the system under test as determined by the gimbal switch. Azimuth and elevation gimbal angles and com - rnand signals from the AZ POSITION and EL POSITION controls are applied to the gimbal switch. The selected signal is then applied to the system under test as a track command.

(K) DMM Group - Displays the value of ac and dc voltages to 200 V and resistance to 2 megohms. The DMM may also monitor external signals using test leads stored on the control monitor rear panel. Power supply voltages and signals from the system under test are applied to test select switches. The outputs of test selector switches are then applied to a CHANNEL SELECTOR switch and finally to the MODE switch. The MODE switch determines the type of measurement to be made. A constant current source is used to provide the necessary current needed to make resistance measurements. The selected signal is then applied to the VOLTS/OHMS switch. This switch selects the proper combination of resistors in the resistor network to scale the signal for measurement and readout in the selected range. Bandpass signals from the system under test and ac voltages are applied through an RMS and S/N computer before application to the VOLTS/OHMS switch. The computer converts the signals into the proper form for measurement by the DVM. Signals are measured by the DVM and the output is decoded and applied to the DMM display to provide digital readout of the measured value.

(L) Analog Meters Group – Displays the value of the VS1 signals from the system under test. Azimuth and elevation VS1 information from the system under test is applied to the meter range switch. The output of this switch is then applied to attenuation circuits. The meter signals from this circuit are applied to the AZ and EL meters.

(M) Bit Status Group – Provides a visual dis - play of BIT test status and results. Test and pass signals from the system under test, select signals from the BIT TEST SELECTOR switch, and in test signals from the IN TEST switch are applied to lamp driver circuits. The lamp driver circuits provide excitation to light proper BIT IN TEST or BIT PASS indicator.

3-3. Control Monitor Detailed Operation Theory

Following functional diagrams and associated theory describe the Control Monitor. The theory is keyed to corresponding areas on the functional diagrams by use of a white letter placed over a hexagonal symbol. i. e., (A) Table 3-1 is a cross-reference table and table 3-2 the wire list for the Control Monitor.

a. Power Conversion Assembly (Fig. 3-2). Power conversion assembly provides all voltages necessary for the operation of the Control Monitor.

(A) The power conversion assembly receives 115V, 3 ph, 400 Hz from the XM65 and applies the signal to the DMM for analysis and to a transformer within the power conversion assembly for conversion to 26V.

(B) The +28V supplied by the XM65 is applied through CB1, the PWR switch, to CB3, the TARGET PWR switch, to IR Target Assembly through J2, and to TB1. The running time meter keeps track of the total operation time of the MCU. The power conversion assembly uses +28V to drive a cooling fan and after filtering uses the +28V to operate a power supply module. The power module produces +5v with 3 amp capability, +5V with 1 amp capability, -12V, +18V, -18V, +60V, and -60V. These voltages are filtered and supplied to the MCU through J12.

(C) The +18V and -18V are used to drive the TSU gimbals with manual controls. A - 12V voltage regulator within the power supply produces -12V for use in the automatic test section.

(D) The bus lines for +5V, +18V, -18V, and returns are shown for different cards in the card cage assembly. Many of the cards have their own +15V and -15V voltage regulators.

(E) A 10V, 400 Hz signal is generated on the A4 card for calibration. During self test, this signal is supplied to the roll and pitch synchros, analog-to-digital converters, and a phase sequence detector.

b. Counter/Tinier (Fig. 3-3). The counter/tin~er is used in conjunction with other MCU test functions to count frequencies and measure time intervals at specified XM65 signals. The counter/timer is capable of measuring and displaying frequencies in the Hz and kHz mode. Time intervals are measured and displayed in seconds and milliseconds.

(A) The A14 card contains a 10 kHz crystal oscillator which acts as a master timer and provides a stable" reference frequency. The 10 kHz is divided by 10 to produce 1 kHz. 1 kHz is divided by 10 to, produce 100 Hz. The 1 kHz and 100 Hz are used in the time interval operation. A 1 second gate pulse is created from the 100 Hz signal to accurately time frequency counts.

(B) Signals supplied to the counter/timer for frequency determination include, 400 Hz, az bandpass (mod F), 900 Hz, and 4 kHz from XM65. Port wire command A and port wire command B from XM65 which are either end of double-ended signal are combined in a differential amplifier, in the A1 card, to produce wire signal C. The single-ended wire signal C is counted by the counter/timer. The A5 card (see fig. 4-12) contains a 35 Hz oscillator. Tile frequency of this oscillator is counted by the counter/timer. The 1 kHz signal from the master timer in card A14 is used to calibrate the counter. The mod F signal from the XM65 is supplied to the counter/timer ford determina - tion of the IR target modulation frequency.

(C) The UNITS switch is used to select the mode of operation. It provides a three bit binary input to the counter/timer to control mode.

(D) The FREQ 'TIME switch is used to select inputs to the counter/timer. It provides a four bit binary code to control the counter/timer signal selection.

(F) Signals that are supplied to the counter/ timer for time interval measurement include launch interval, az count gate, el count gate, and timer interval. The launch interval is the time between timer start and t=0, approximately 1.52 seconds. The az and el count gates are involved in the servo control tests. The timer interval is the time between t=0 and any interrupt time in the XM65 programmer cycle,

(F) The counter/timer card, a15, includes all of the selection and switching circuits involved in the counter/timer function. The counter function is performed by counting an input signal for one second. the resulting count represents cycles per second. In the Hz mode the input signal is multiplied by 10 before counting. In the kHz mode the signal is counted as it is. The timer function is like the counter function except that the frequency is a constant 100 Hz in seconds and 1 kHz in milliseconds. The constant frequencies are counted for the time interval to be measured.

(G) The counter signal selection multiplexer uses a four bit binary signal from the FREQ/TIME switch in select one of seven input signals to be counted.

(H) The 10X frequency multiplier is a phase-locked loop which multiplies the input frequency by a factor of 10.

(I) Counter-timer units multiplexer controls the selection of the frequency to be counted. The UNITS switch supplies a two bit binary signal for selection of appropriate frequencies. In the kHz position, the selected frequency signal from

the counter signal selection multiplexer is selected. In the Hz position, the 10X selected frequency signal is selected. In the MILLISEC position the 1 kHz signal is selected. In the SEC position the 100 Hz signal is selected. The selected signal is now applied to a frequency count gate.

(J) The timer signal select multiplexer uses the binary signals from the FREQ TIME switch to control the selection of timer signals to be measured.

(K) The output of the timer signal multiplexer is applied to the frequency count (rate when the FREQ, TIME switch is in one of the time interval positions, timer start interval, timer interval (1, 5) (2), az count gate (3), or el count gate (4). When the FREQ 'TIME switch is in a counter position, self test, 35 Hz, 400 Hz, 900 Hz, 4 kHz, W/S, or MOD F the 1 second pulse from the master timer is applied to the frequency count gate.

(L) The data strobe and reset circuits control the accumulator and display functions within the A18 card. The manual reset signal results from the system reset. At the end of the frequency count gate pulse, a data strobe is created at pin 5 of card A15, and, except when the FREQ/TIME switch is set in 2, an accumulator reset pulse follows at pin 4 of card A15.

(M) The frequency count signal is controlled by the frequency count gate and is applied to pin 20 of the A18 card during the times in which the frequency count gate switch is closed.

(N) The A18 card is the counter timer accumulator and contains the decade counters, data latches, and decimal logic for the counter 'timer display. When the UNITS switch is in a position other than OFF the counter timer display is enabled.

(O) The decade counters are used to count the count pulse signal from pin 7 of card A15. The counter is accumulated for the time in which the frequency count gate switch is closed.

(P) When the data strobe from pin 5 of card A15 occurs, the data latches are enabled to accept the existing count from the decade counters. The information in the data latches is displayed on the counter, timer from panel displays.

(Q) The leading zero blanking logic disables all zeros to the left of the first significant digit. The decimal select logic is controlled bv the binarv signal from the UNITS switch. The decimal placement on the counter timer display corresponds to the mode of operation.

(R) The counter timer display is a four digit incandescent digital display located on the front panel.

c. DMM Input Selector Switches (Fig. 3-4). The channel selector switch selects from test selector 1. test selector 2, +23V, test leads, log H, DC self test, and AC self test and applies them to the DMM. Test selector 1 and test selector 2 switches separately select one of the many signals to be monitored by the DMM.

(A) The matrix for test selector 1 shows the electrical connection between input pins A1 thru F12 and output pins AC1 thru FC1. The selected signals are applied to the channel selector switch.

(B) The matrix for the channel selector switch shows the electrical connection between input pins A1 thru A7 and B1 thru B7 and output pins AC1 and BC1.

(C) The matrix for test selector 2 shows the electrical connection between input pins A1 thru F12 and output pins AC1 thru FC1. The selected signals are applied to the channel selector switch.

(D) The matrix for the channel selector switch shows the electrical connection between input pins A3 thru A12 and B8 thru B12 and output pins AC1 and BC1.

d. DMM (Fig. 3-5). The DMM is used extensively thr6ughout TSGMS system tests. The MODE switch on the front panel provides a selection of the types of operations available for the DMM. The VOLTS/OHMS switch controls the range of measurement. The DMM consists of the DMM input selector switches, the DVM attenuator assembly, including the VOLTS/OHMS and MODE switches, the signal to noise ratio computer, the RMS converter. the DVM, the DVM decoder, and the DMM front panel display.

(A) The DVM attenuator assembly contains the VOLTS/OHMS and MODE switches and associated circuitry as an assembly with electrical access through J15. In this assembly, the MODE switch is S1 and the VOLTS/OHMS switch is S2. The inputs from the CHANNEL SELECTOR switch, input hi and input low, are applied through the MODE and VOLTS OHMS switches to appropriate circuitry which corresponds to the switch settings. When the MODE switch is set to OHMS, the input signals are applied across a resistance network. A constant current source produces a voltage, across the external resistance to be measured,

which corresponds to the value of the resistance. The VOLTS/OHMS switch, in this case, changes the resistance network circuit to select the proper current. When the VOLTS/OHMS switch is set to 2K 2V in the OHMS mode the current is 1 ma, in the 20 K/20V the current is 100 µa, in the 200 K/200V the current is 10 µa and in 2 MEG the current is 1 µa. When the MODE switch is in DC, the input signals are applied across a voltage divider input voltage to the output. The voltage divider maintains the proper input voltage range for the DVM and is controlled by the VOLTS/OHMS switch. The DC FILTER position of the MODE switch is the same as DC except that the signal is applied to a low pass filter before entering the DVM. The S/N position is used to test the signal to noise ratio of the XM65 bandpass signals as prepared in card XA9. The RMS position allows the circuitry on card A9 to convert all ac signals to dc for the DVM. The VOLTS/OHMS switch is also used in the RMS mode. The voltage divider is used similarly to its use in the DC and DC FILTER modes.

Ⓑ The RMS and S/N computer are located on card A9. The DVM is capable of measuring only dc voltages. The DMM function of the MCU assembly must be able to accurately measure and display ac voltages and the S/N of the az and el bandpass signals. The S/N computer uses either the az bandpass (mod F) and ref signals or the el bandpass and ref signals to determine bandpass S/N. Since the S 'N determination is the same for az and el channels, only an analysis of the el channel is provided. The el ref signal is a sine wave which is related to the el bandpass signal. The bandpass burst occurs at every other zero crossing of the el ref sine wave. The S/N is determined for the bandpass signal by measuring the bandpass signal level at the zero crossing and measuring the noise level at times other than zero crossing and comparing the two.

Ⓒ An ac signal from the DVM attenuator assembly is applied to card A9 where it passes through a buffer amplifier to the RMS converter. The RMS converter produces a dc voltage between 0 and +2V which is proportional to the ac input voltage. This dc output is now returned to the DVM attenuator assembly.

Ⓓ The DVM performs a digital to analog conversion to measure and display a digital reading corresponding to the dc input voltage. The DVM measures only dc signals within 0 and ±1. 999V, therefore, all inputs from the DVM attenuator must satisfy these requirements. The DVM also produces a serial BCD display signal, a drive signal for each of the five output digits, a DVM strobe, and a DVM sign signal.

Ⓔ The DVM decoder transforms the serial display signal from the DVM to the constant parallel display for the front panel. The circuits consist of data latches which store the four bit codes for each of the five display digits. The BCD information for the five digits is cycled through the BCD (l), BDC (2), BDC (4), and BCD (8) inputs. The information for each digit is applied at the same time that the signal at the appropriate DVM D1 through DVM D5 signal is high. The combination of the BCD codes and the DVM D1 through DVM D5 signals assigns the proper numerical value to each of the five display data latches. The DVM strobe disables changes of display during DVM analyzing sequences. The data latches hold the BCD information last presented and apply this information to the respective front panel display digit. The + blanking signal suppresses the + or - sign while the DMM is in RMS, S/N, or OHMS mode. The units blank signal blanks the units digit when DMM is in S/N mode. The overflow/under range signal causes the display to blink on and off when the input is below the minimum and blink all zeros on and off when the input is above the maximum DVM input levels. The + and - signs are controlled in the same manner as the digits. The remainder of the DVM decoder performs lamp test on the DMM display and leading zero blanking during operation.

Ⓕ The A17 card contains an overflow/ underrange control section. When the input to the DVM from the DVM attenuator assembly is below or above the range of the DVM, the overflow/underrange circuit causes the front panel display to show this condition as described in Ⓔ

e. Angle Indicators (Fig. 3-6).

Ⓐ The API 1 switch (S4) controls the information displayed on the API 1 front panel display. The S4A section of the API 1 switch supplies the resolver sin and the resolver cos signal to the az angle-to-digital converter assembly (See B). The OFF position provides no signal to the angle-to-digital converter assembly. The self test position provides a modulated signal which represents +45° to the angle-to-digital converter assembly. The GYRO ROLL position provides the

angular information from the roll synchro (see C), to the angle-to-digital converter assembly. The TSU AZ position provides the angular information from the XM65 az gimbal resolver to the angle-to-digital converter assembly. The S4B section of the API 1 switch supplies the proper reference signal to the angle-to-digital converter assembly. Since the angular information signals are all modulated signals it is necessary to provide the proper reference signals to decode the information for display.

(B) The az angle-to-digital converter assembly interfaces between the roll synchro, the XM65 angular signals and the API 1 display. A Scott-T type transformer converts the three phase roll synchro output to a two-phase signal. The calibration signal which is phase C output from the roll synchro is applied as both the sin and cos of the angle. When the sin and the cos of an angle are equal, the angle is 45° ; this is the calibration angle. The two phase output from the Scott-T transformer is applied through switch S4 as a sin α and cos α or the sin and cos of the gyro roll angle. The signal selected by switch S4 is applied to the angle-to-digital converter assembly as the resolver sin and COS. The resolver sin and cos and a reference signal are necessary for the angle to digital converter to evaluate the angle. The strobing circuit controls the accumulation and display of data. The angle to digital converter provides a four digit BCD output to the API 1 display.

(C) The roll control located on the front panel supplies simulated aircraft roll angle information to the XM65. This information is supplied in the form of a three phase amplitude modulated signal. As described in subparagraph A, the simulated angle from the roll synchro may also be displayed on the API 1 display when S4 is in GYRO ROLL.

(D) The API 1 display is a four digit readout which shows angles in degrees as selected by the API 1 switch. The range of the display is from -180.0 degrees to +180. 0 degrees.

(E) The API 2 switch (S5) controls the information displayed on the API 2 front panel display. The S5A and S5B switches act in the same manner as S4 to supply self test gyro pitch, and TSU el information to the angle-to-digital converter assembly located on the A2 card. The API 2 switch also has a position from which a signal representing the XM65 ρ angle is supplied to the angle-to-digital converter assembly.

(F) The A2 card is identical to the A3 card and acts the same for API 2 and the A3 card acts for API 1. The output consists of a four digit BCD output to the API 2 display.

(G) The pitch control located on the front panel supplies simulated aircraft pitch angle information to the XM65. This information is supplied in the form of a three phase amplitude modulated signal. As described in (E), the simulated angle from the pitch synchro may also be displayed on the API 2 display when S4 is in GYRO PITCH.

(H) The API 2 acts identically to the API 1 display for angles selected by the API 2 switch.

f. Timer Interrupt (Fig. 3-7). The timer interrupt function of the M U controller interacts with the programmer within the XM65. The timer interrupt indicators show the progress of the XM65 programmer during normal operation. The TIMER INTERRUPT switch selects times at which the XM65 programmer will be caused to stop and hold.

(A) The XM65 supplies seven time signals to the MCU. The-se signals indicate the occurrence of the following times:

T6	t = 0 s
T7	t = .17 s
T11	t = .79 s
T13	t = 1.35 s
T14	t = 2.34s
T15	t = 4.32s
T17	t = 13.48s

The time T6, t = 0 s is the time of synthetic first motion or fire of missile. The interval switch selects the time of interruption from the above times. In the RUN position there is no interruption and the XM65 programmer continues its progress until end of test. In any other position T6 through T17 the arrival of that time triggers a programmer interrupt signal and stops the XM65 programmer sequence. If position T6 is chosen the XM65 programmer is stopped and held at t = O s. By moving the TIMER INTERRUPT switch to position T7 the XM65 programmer will continue its sequence from t = O s to t = .17 s. The START/OFF switch allows the operator to start the XM65 programmer from the MCU without having to initiate a firing sequence from the aircraft.

(B) Signal processor no. 1, the A16 card interfaces between the XM65 programmer, the timer interrupt indicator lamps, and

the MCU counter/timer. A sequence detector located on card A16 analyzes the 7 VRMS, 900 Hz 2 phase signal from the M65. The output of the sequence detector controls the front panel 2 phase lamp. The time signals from the M65 programmer are processed through the logic circuits on the A16 card to control the timer interrupt indicator lamps. The timer interrupt signal from the interval switch is processed through the A16 card and measured in the counter/timer circuit. A timer start interval signal supplied from the timer interrupt logic to the counter/timer indicates the time between timer start and t = 0 s.

(C) The timer interrupt indicators are seven incandescent lamps which indicate M65 programmer sequencing.

g. Analog Meters (Fig. 3-8). The analog meters in the MCU enable the operator to monitor the az and el VS1 signals. The VS1 signals are slowly varying dc voltages indicating the angular error of the missile flight in the M65. The meter range switch enables the operator to select sensitivity.

h. Bit Status (Fig. 3-9). The bit status section of the MCU is used to monitor and test the bit function of the M65.

(A) The A22 card contains data latches and associated circuitry to control the BIT PASS indicators on the MCU front panel. If the entire bit test is initiated at the M65, the logic on card A22 follows the bit sequence and lights the BIT PASS indicators accordingly. As each test begins the appropriate BIT PASS lamp lights and remains lit if the test passes. If the test fails the light goes out after the individual test. The BIT IN TEST remains lit while any bit test is in progress.

(B) The bit status indicator lamps are incandescent lamps used to indicate bit test status.

(C) The IN TEST switch is used with the BIT TEST SELECTOR switch to enable specified bit test within the entire bit function.

(D) The BIT TEST SELECTOR switch enables the operator to select a specific bit test. Tests 3 through 10 may be selected and tests 1 and 2 may not. Selection of the IN TEST switch and the BIT TEST SELECTOR switch applies an in test signal to the M65 and lights the BIT IN TEST lamp on the MCU front panel. The selection also enables the correct BIT PASS indicator lamp on the MCU front panel for the selected test.

i. Automatic Test Selector (Fig. 3-10). The automatic test selector includes ill of the components involved in setting up the various automatic tests.

(A) The TEST NUMBER switch is a two digit selector switch which establishes the conditions for each test. The output of the TEST NUMBER switch is two four bit BCD words which are applied to five ROM's on cards A21 and A20, test encoders no. 1 and no. 2.

(B) The BCD words from the TEST NUMBER switch cause the ROM to produce logic outputs which are consistent with the test being selected. The outputs are distributed throughout the MCU and IRTA to control automatic testing procedures. Each ROM has eight LED indicators at its output to indicate the logic levels of each output signal.

j. Automatic Test Process and Window Comparator (Fig. 3-11). The signal selector, card A13, accumulates the signals under test and processes them for use in the window comparator A11. The window comparator evaluates the signals under test and provides a pass/fail output consistent with results.

(A) Signal selector, card A13, is controlled by binary logic signals from the automatic test selector. Signals which are the results of the automatic tests are received by A12 and processed for evaluation by the window comparator.

(B) A11 of the signals are applied to a multiplexer which selects one of them to be evaluated in the window comparator. The

multiplexer is controlled by a three bit binary word from the automatic test selector.

(C) The multiplexer signal selection is shown in this table. The three bit binary words shown are the logic codes which select the output to the window comparator.

(D) This binary counter counts the time code pulses and produces a three bit output code for the time control of the window comparator.

(E) The upper, middle, and lower limits generators are ROM decoders which respond with a proper eight bit binary word to correspond to the eight bit binary input from the automatic test processor and the binary counter (see D).

(F) The upper. middle. and lower limits generators produce three eight bit binary words. In order to monitor the binary words. negative logic LEDs are mounted on the card. A lighted LED indicates a zero for that bit and an unlighted LED indicates a 1 for that bit.

(G) The outputs from the upper, middle, and lower limits generators are applied to two digital-to-analog converters to generate the analog upper and lower limits. The analog signal from signal selector must be within these limits to cause a pass signal from the window comparator.

(H) The window comparator, card A11, uses binary information from the automatic test selector to control test processing. The analog signal from signal selector is applied to the window comparator for evaluation of signal times and signal magnitude within certain boundaries. Result is a logic pass or fail signal.

(I) A 100 Hz signal from the A14 card is divided to produce a 10 Hz and a 10 Hz signal delayed by 180 degrees. The 10 Hz signal is applied to a binary counter for all but the CVAC test for which the 10 Hz delayed signal is used. The binary counter produces an eight bit binary word that progresses with the 10 Hz signal.

(J) The time code generator produces output pulses at the occurrence of specific binary words at its input.

(K) These output pulses are selected according to a time code from the automatic test selector. The resulting time code selection corresponds to the test progress.

k. Signal Processors Numbers 3 and 4 (Fig. 3-12). Signal processors numbers 3 and 4 are used to process signals from the XM65, IRTA, and the servo control. The automatic test selector produces logic commands to control the signal processing function.

(A) Signal processor no. 3, card A4, produces simulated airspeed information which is applied to the XM65 for static testing purposes. The az and el VS1 signals are also filtered on this card for use in the DMM and the automatic test processor. The az and el strobes for the angle indicators are produced from ihe launch constraint signal. The CONSTRAINT VALID and READY indicator lamp controls are produced in card A4. The bit comp. 1 through 4 produced in card A4 are used to disable parts of the bit function during automatic testing.

(B) Signal processor no. 4, card A1, produces the az and el torque buffered signals for simulating XM65 torque com - mands. The az and el VS1 short relays, the simulated clutch engage command, and target amplitude are also produced on card A1.

l. Servo Control Test system (Fig. 3-13). The servo control test system is made up of signal processor no. 5, card A17, azimuth servo control, card A7, el servo control, card A6, and servo analyzer and reference generator, card A5. The servo control test system monitors and controls the XM65 servo system and provides simulated signals for testing.

(A) In the A17 card the az and el gimbal angle signals are filtered and applied to the az and el servo control cards. A7 and A6. The servo information from the angle-to-digital converter cards A2 and A3 is applied to logic circuits to generate the az and el slew gates.

(B) In the A7 card, test command signals from the automatic test selector, az gimbal angle filtered, and az stick command signals from the XM65 are used to produce test control for the XM65. The three binary az servo word from the automatic test selector is processed by a digital-to-analog converter. The digital-to-analog converter output is added to the az gimbal angle filtered to produce the az ready circuit signal. The digital-to-analog converter also provides controlled voltage which drives an amplifier to give the az stick command out. The auto command, denoting testing in auto mode, sets up conditions to test the servo system.

(C) A - 18V and -18V are supplied across two potentiometers to give a controlled voltage dividing effect for use in TSU gimbal control.

(D) The el servo control, card A6, acts in the same manner as the az servo control, card A7.

(E) The A5 card produces a servo analyzer dc signal when it receives an az or el select servo analyzer signal from automatic test. A 35 Hz oscillator produces az in and el in signals to the X65 servo control. The az and el out signals and az and el error signals are applied to a phase-to-pulse-width converter which produces a square wave with varying duty cycle. This signal produces a proportional servo analyzer dc signal for analysis in the window comparator. Reference voltages (+1. 500 V ref and 1.500 V square wave) which are used throughout the MCU controller assembly are produced in card A5.

(F) A +18V and -18V are supplied across two potentiometers to give a controlled voltage dividing effect for use in the TSU gimbal control.

m. Manual Controls (Fig. 3- 14). The manual control are used by the operator to perform test sequences which are not available with the automatic tests.

(A) The manual control switches which affect logic within the MCA stimuli control, A8 card, are as follows:

CVAC

G BIAS

PSB1

P RATE

P ERROR

Y ERROR

Y RATE

YSB1

YOLC

These switches may be set in the disable or normal position for disabling the signals or not as necessary.

(B) The automatic test selector produces a three bit binary control plus the auto signal for the automatic test control of signal disabling. The binary codes for disabling the XM65 signals are shown in the table.

(C) The A8 card contains logic for disabling the XM65 signals by either the automatic test conditions or manually.

(D) The A8 card also contains the relays which actually disable the XM65 signals.

(E) The PVCO and YVCO switches control the VCO disabling logic within the XM65.

n. Indicator Lamp Drivers (Fig. 3- 15). The indicator lamps which provide, to the operator, information as to input power status, XM65 constraints, and automatic test status are located on the front panel and controlled by the pass/fail driver card A10.

(A) The LAMP TEST switch, when pressed, lights all of the lamps on the MCU front panel.

(B) The A10 card provides the logic and drivers for the following lamps.

3 PHASE

READY

IN TEST

PASS

FAIL

CONSTRAINT VALID

The three phase, 400 Hz signal from the XM65 is transformed to a 26V, 400 Hz, 2 ph signal in the power conversion assembly. This two phase signal is monitored for proper phase sequencing and turns off the 3 PHASE lamp when the signal is faulty. The READY lamp is controlled by card A4, and lights to show that the XM65 servo control is ready to begin a test sequence. The IN TEST lamp lights while an automatic test is in progress and has not yet failed. The PASS lamp lights at the end of an automatic test sequence if there has been no failure. The FAIL lamp lights to show a failure immediately during a test sequence.

(C) These are incandescent lamps controlled from card A10.

(D) The CONSTRAINT VALID lamp lights to show if the pre-launch constraints have been met within the XM65. A test can proceed without constraints being met.

o. TSU Gimbal Control and Manual Boresight Controls (Fig. 3-16). The TSU gimbal controls consist of the gimbal switch and the AZ and EL controls. The purpose is to create simulated track commands for the XM65. The manual boresight control consists of two switches, AZ and EL, for manually controlling the boresight motors within the XM65, TSU.

(A) When testing the XM65, the XM65 is in STOW the gimbal switch must be in STOW also. If the XM65 is in TRACK the gimbal switch must be in TRACK.

(B) The manual boresight controls are three position switches which can be used to operate the boresight motors within the XM65, TSU. By manually changing the boresight motors position it is possible to

determine if the M65 is capable of resetting to operational position, When the gimbal switch is in TRACK position, the az and el gimbal filtered signals are applied to the TSU as az and el track stick commands 100°/S.

p. IR Target Assembly Control (Fig. 3-17). The IR target assembly control includes the master timer, A14 card, in the MCU and the IR modulator assembly. The IR target assembly functionally checks the oper - ation of the error detector within the TSU of the M65.

(A) The target selector switch controls the selection of the target diode which is in operation. There are five diodes, center, left, right, up, and down.

(B) The LEVEL control provides a manual control of IR diode intensity.

(C) The A 14 card contains the logic for controlling the selection of target diodes. Either the manual selection or the four bit binary code from the automatic test selector controls the IR target assembly diodes. The circuitry which controls the TO clutch engage signal for an external oscilloscope is in the A14 card.

(D) A 10 kHz crystal oscillator followed by a series of divider circuits produces a 100 Hz window comparator signal (see figure 3-11), and a 1 Hz alternate target signal.

(E) The IR modulator assembly contains the relays which control the target diodes.

(F) The diodes must be turned off and on at the frequency of the bandpass filter within the TSU to operate properly. A temperature sensor near the diodes produces feedback information to maintain stable diode operation.

(G) The IR diodes are able to produce an IR signal that is compatible with the M65, TSU error detector. A 5 ohm resistor is wired in series with the diode in operation to limit the current through that diode.

(H) With S 1 in NORMAL, target amplitude applied via P1 -10, where the signal is amplified, and applied to DIODE DRIVER via oscillator relay. Relay operates at oscillator frequency. Current thru selected diode is fed back to P1-7 as CURRENT SENSE. CURRENT SENSE amplifiers control amplitude of diode drive signal via NORMAL/TEST S 1 and Log H amplifier.

Table 3-1. Control Monitor Modules/Functional Diagram Cross -Reference

Card/ Subassembly	Functional Diagram Figure Number	Card/ Subassembly	Functional Diagram Figure Number
A1	Figures 3-3, 3-6, 3-12	A16	Figure 3-7
A2	Figure 3-6	A17	Figure 3-13
A3	Figure 3-6	A18	Figure 3-3
A4	Figure 3-12	A19	Figure 3-5
A5	Figure 3-13	A20	Figure 3-10
A6	Figure 3-13	A21	Figure 3-10
A7	Figure 3-13	A22	Figures 3-9, 3-16
A8	Figure 3-14	DVM attenuator	Figure 3-5
A9	Figure 3-5	PWR conversion assembly	Figure 3-2
A10	Figures 3-13, 3-15	PWR distribution	Figure 3-2
A11	Figure 3-11	IRTA	Figures 3-17, (3-17 .1; C-NITE)
A 12	Figure 3-11	DMM display	Figure 3-5
A13	Figure 3-11	API 1 display	Figure 3-6
A14	Figures 3-3, 3-17	API 2 display	Figure 3-6
A15	Figure 3-3	COUNTER/TIMER display	Figure 3-3

q. C-NITE IR Target Assembly Control (Fig. 3-17.1). The unique C -NITE items include the power adapter, thermal patch, and beam steering assembly. The beam steering assembly is a lens in a housing that is fitted over the left IR diode to refocus the IR energy which for C-NITE testing must travel a greater distance. The left IR diode of target 2 and thermal patch are powered through the power adapter and used to check the boresight of the FLIR portion to the direct view portion of the C-NITE system.

(A) The thermal patch produces a thermal target that is used during C-NITE system check to verify boresight. The thermal patch radiates heat at temperatures near 130 degrees F.

(B) The power adapter contains a voltage divider which controls target voltage selection and sets a constant left IR diode energy output. The power adapter also monitors battery voltage and log H functions.

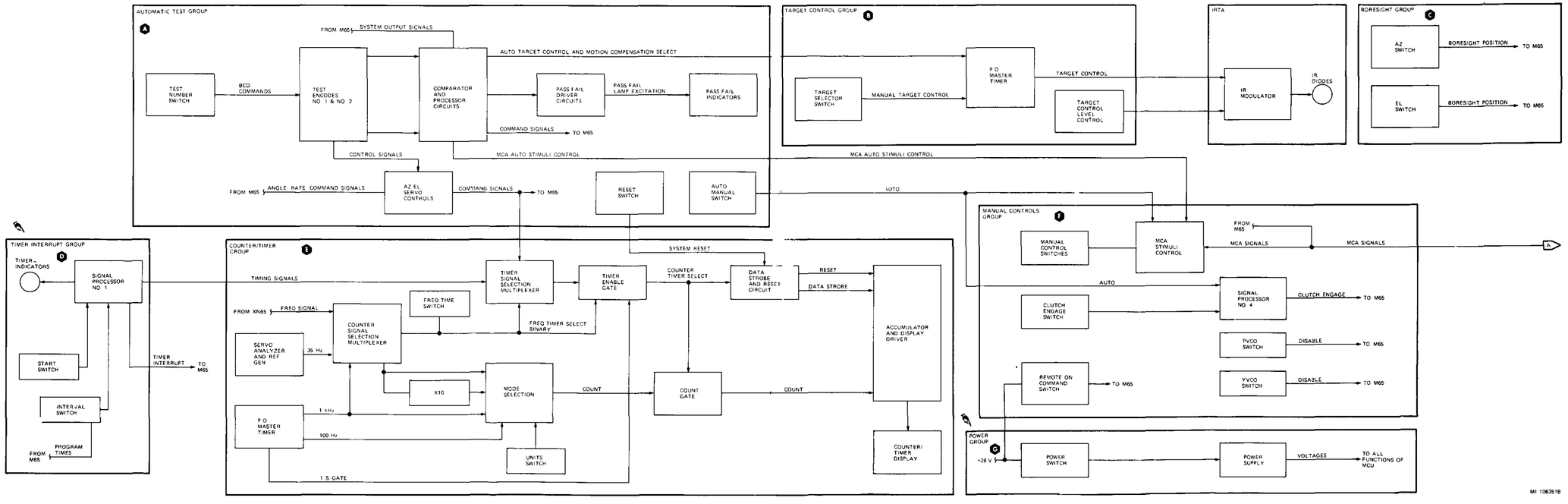

Figure 3-1. Control Monitor Block Diagram (Sheet 1 of 2)

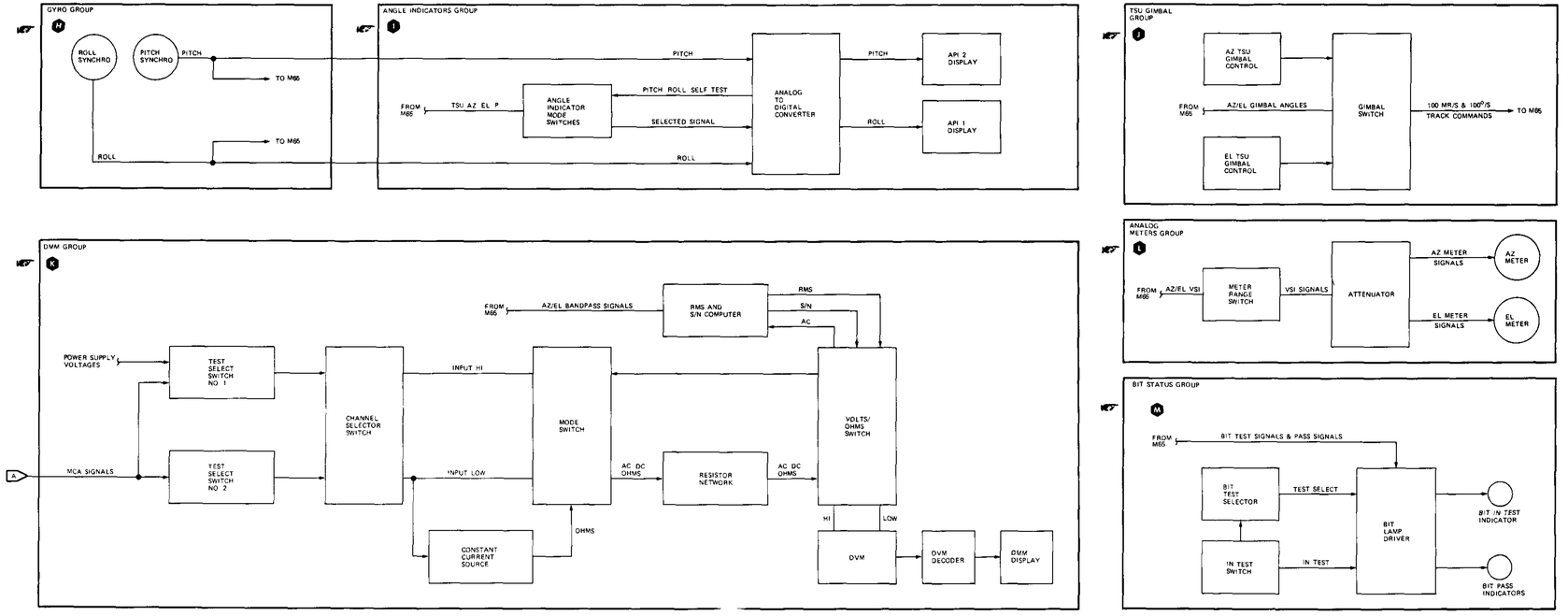

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Figure 3-1. Control Monitor Block Diagram (Sheet 2 of 2)

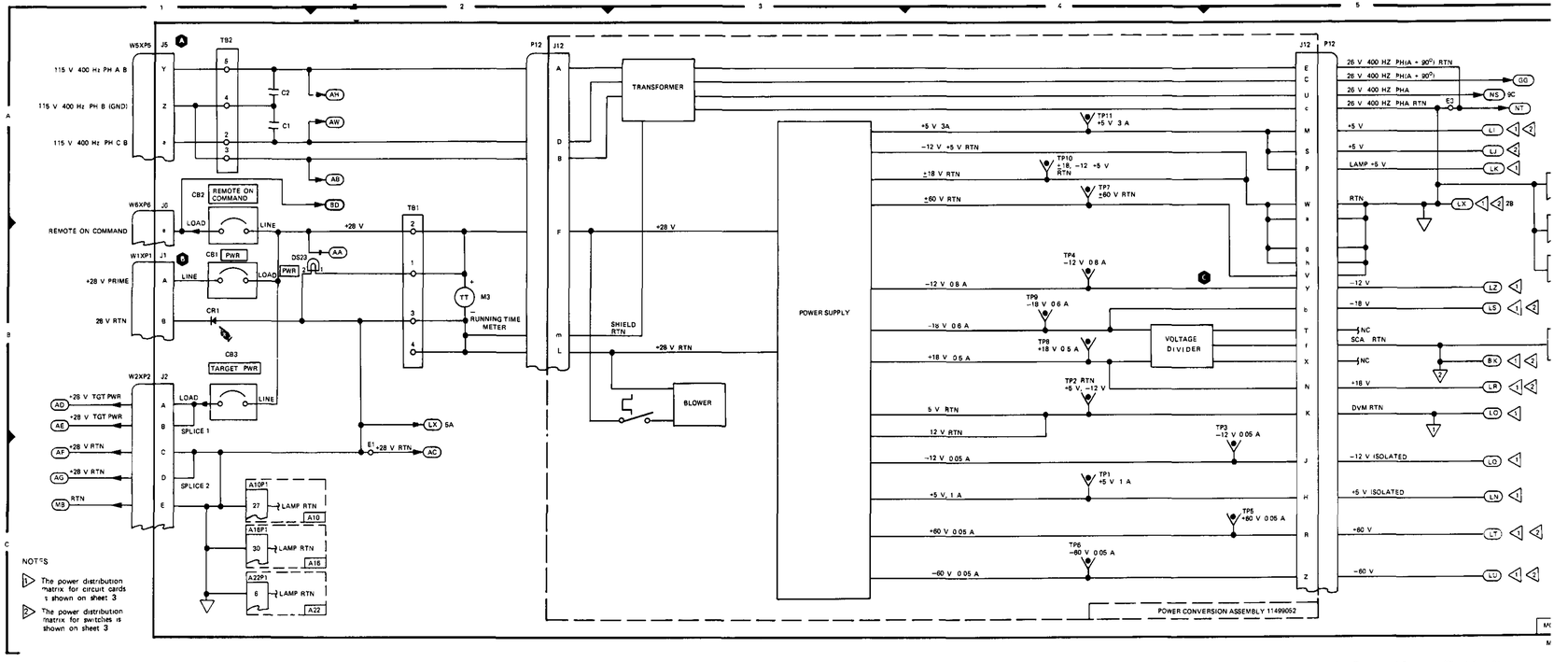

Figure 3-2. Power Conversion Assembly Functional Diagram (Sheet 1 of 3)

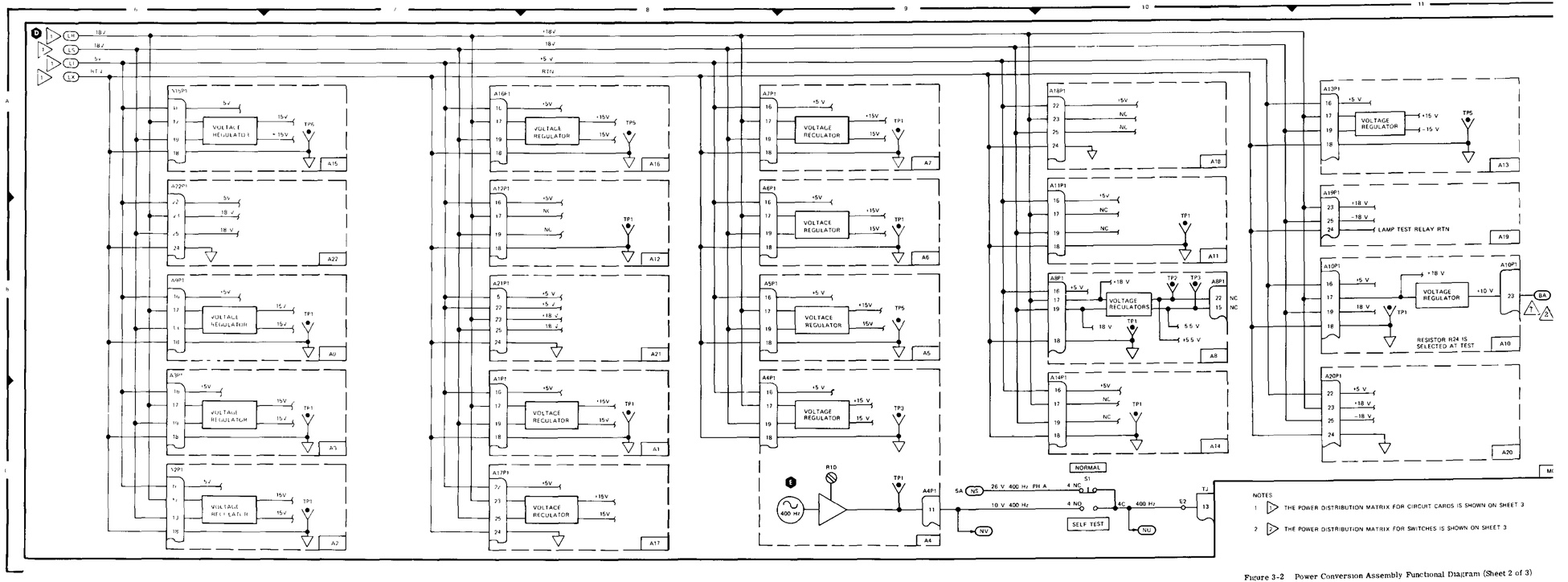

Figure 3-2 Power Conversion Assembly Functional Diagram (Sheet 2 of 3)

NOTES

1 THESE TABLES SHOW POWER DISTRIBUTION TO CARDS SWITCHES JACKS AND RESISTORS

THE POWER DISTRIBUTION MATRIX SHOWN BELOW LISTS THE CIRCUIT CARDS DISPLAY JACKS RESISTORS AND RESPECTIVE PIN NUMBERS WHICH RECEIVE +5 V +18 V −18 V LAMP +5 V −12 V 12 V ISOLATED +5 V ISOLATED +60 V −60 V AND RETURN SIGNALS NOTE THAT J15 PINS E W AND J ARE CONNECTED INSIDE THE DVM ATTENUATOR ASSEMBLY ALSO NOTE THAT +10 V IS GENERATED ON THE A10 CARD

DESIGNATOR	SIGNAL NAME	PIN NUMBERS																												
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	J13	J15	J16	J17	TJ	J18A	J18B	R1	R2	R3
LJ	+5 V	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	22		22	5 22											
LR	+18 V	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	23	23	23	23	23	23								1	1	
LS	−18 V	19	19	19	19	22	19	19	19	19	19	19	19	19	19	19	19	19	25	25	25	25	25								3	3	
LX	RTN	18	18	1c	18	18	18	18	18	18	18	18	18	18	18	18	18	24	24	24	24	24	24	A	P	A	A	30					1
LK	LAMP +5 V																		15														
LZ	−12 V																				43	13											
LQ	−12 V ISO																								D				2				
LN	+5 V ISO																			40					A								
LO	DVM ISO RTN																	42		1					E W J					1			
BK	SCA RTN	32			13						1			3c				3															
LT	+60 V						4	4																									
LU	−60 V						3	3																									
BA	+10 V	34															10						13										E3

▽ INDICATES GROUNDED TO J12 PIN W OF POWER CONVERSION ASSEMBLY

▽ INDICATED GROUNDED TO J12 PIN K OF POWER CONVERSION ASSEMBLY

▽ INDICATES GROUNDED TO J12 PIN I OF POWER CONVERSION ASSEMBLY

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
AA	2B	3−4	DMM INPUT SELECTOR SWITCH
AA	2B	3−7	TIMER INTERRUPT
AA	2B	3−9	BIT STATUS
AA	2B	3−15	INDICATOR LAMP DRIVERS
AB	2A	3−4	DMM INPUT SELECTOR SWITCH
AC	2C	3−4	DMM INPUT SELECTOR SWITCH
AD	1B	3−17	IR TARGET ASSEMBLY CONTROL
AE	1B		
AF	1C		
AG	1C		
AH	2A	3−4	DMM INPUT SELECTOR SWITCH

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
AW	2A	3−4	DMM INPUT SELECTOR SWITCH
BD	2A	3−4	DMM INPUT SELECTOR SWITCH
GG	5A	3−13	SERVO CONTROL TEST SYSTEM
MB	1C	3−17	IR TARGET ASSEMBLY CONTROL
NT	5A	3−6	ANGLE INDICATORS
NU	10C	3−3	COUNTER/TIMER
NU	10C	3−6	ANGLE INDICATORS
NU	10C	3−13	SERVO CONTROL TEST SYSTEM
NV	9C	3−6	ANGLE INDICATORS

2 THE POWER DISTRIBUTION MATRIX SHOWN BELOW LISTS THE SWITCH ASSEMBLIES WHICH RECEIVE +5 V +18 V −18 V +60 V −60 V AND RETURN SIGNALS NOTE THAT +10 V IS GENERATED ON THE A10 CARD

DESIGNATOR	SIGNAL NAME	S1	S2	S3	S4	S5	S7	S9	S10	S13	S14	S15	S17	S18	S19	S22	S23	S25	S26	S27	S28	S29	S30	S31	S33	S34	S35
LJ	+5 V		A2 A5 B4 B5 C1	A1 A3 A5 A7 A9 A11 B2 B5, B6, B7 B10 B11 C4 C5 C6 C7 D8 D9 D10, D11 D12	B8 B9 B10	B8, B9 B10 B11	A4			2	1 3	AC BC			C1	3	3	3	3	3	3		3	3	3	3	3
LX	RTN	1C 2C 3C	A1 A2 A4 B1 B2 B3 C2 C3, C5	A2 A4 A6 A8 A10 A12 B1 B4 B5 B8 B9 B12 C1 C2 C5 C8 C9 C10 C11 C12 D1 D2 D3 D4 D5 D6 D7	C2 C3	C2, C3	B1 B2 B3 B4 B5 B6 B7 D3 F3	D11 D12				AC BC			1	1	1	1	1	1		1	1	1	1	1
LR	+18 V						A2																				
LS	−18 V						A5																				
BK	SCA RTN				C4	C4, C5	D4 D6 D10 D11 F4 F6 F10 F11	B10 B11 D4 D5 D6 D7 D8 D10 F4 F5 F6 F7 F8 F9 F10 F11 F12																			
LT	+60 V						A1																				
LU	−60 V						A6																				
BA	+10 V						A3		2				1 4 6	3 4 5								3					

▽ INDICATES GROUNDED TO J12 PIN W OF POWER CONVERSION ASSEMBLY

▽ INDICATES GROUNDED TO J12 PIN I OF POWER CONVERSION ASSEMBLY

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Figure 3-2. Power Conversion Assembly Functional Diagram (Sheet 3 of 3)

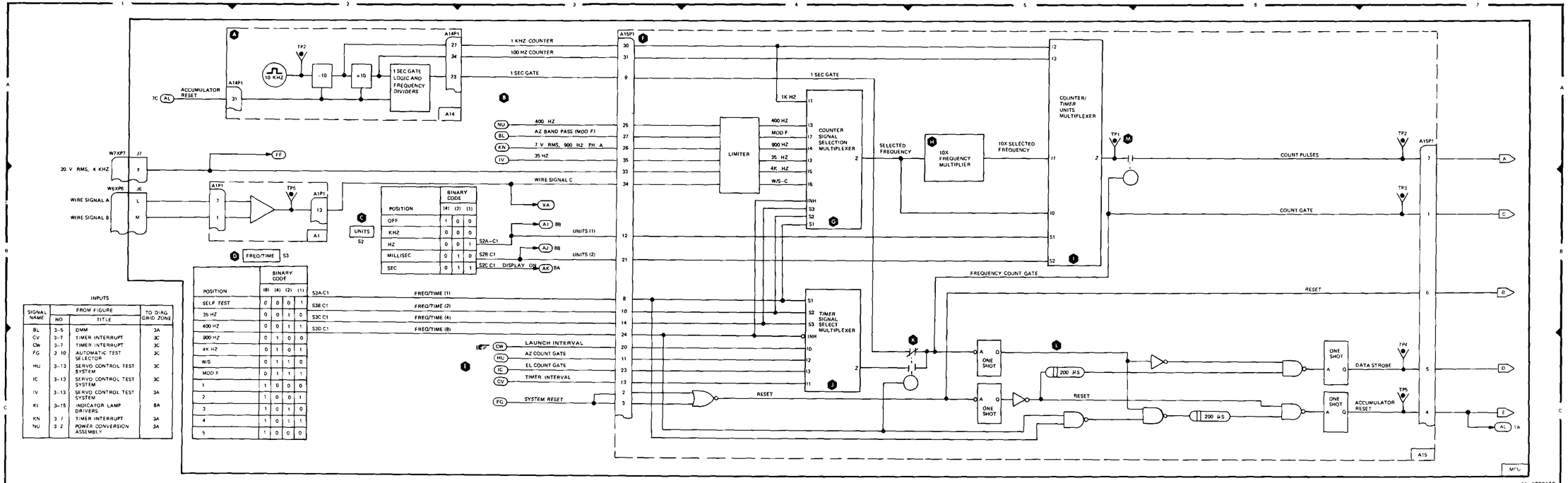

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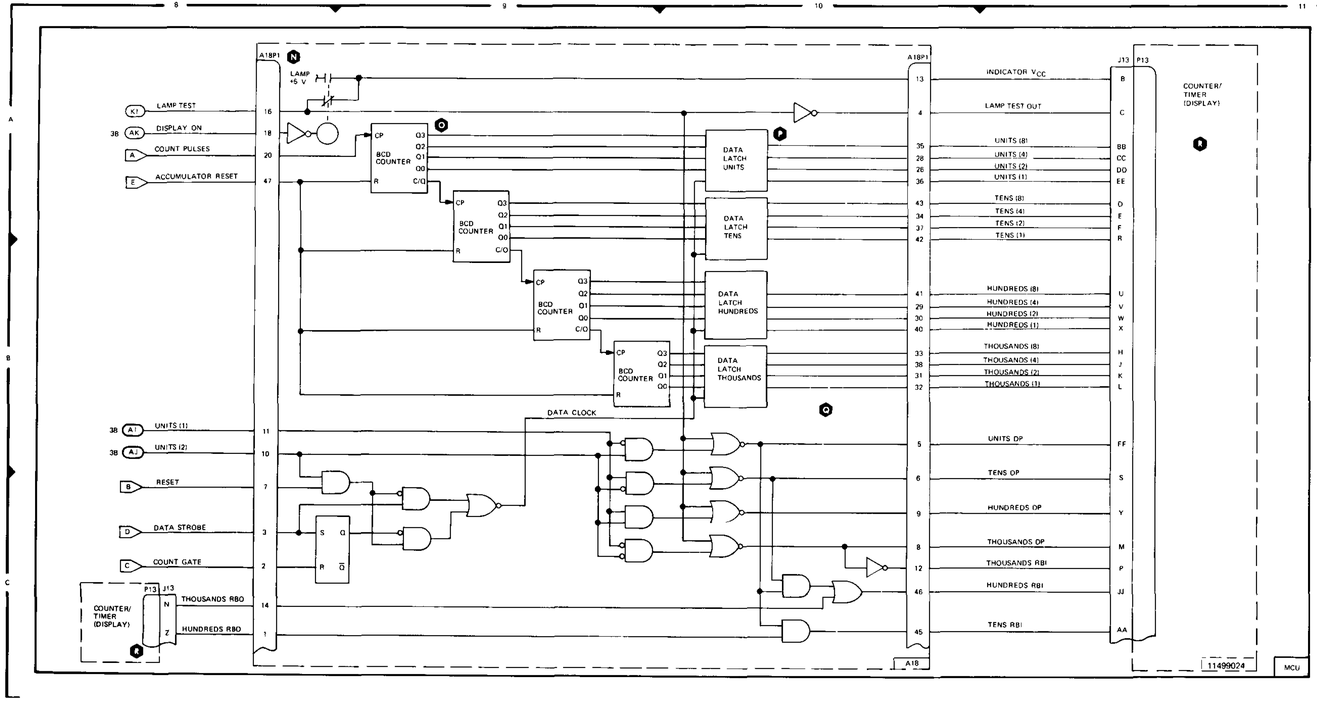
Figure 3-3. Counter/Timer Functional Diagram (Sheet 1 of 2)



OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE	
		NO	TITLE
FF	2A	3-4	DMM INPUT SELECTOR
XA	3B	3-4	DMM INPUT SELECTOR

Figure 3-3. Counter Timer Functional Diagram (Sheet 2 of 2)

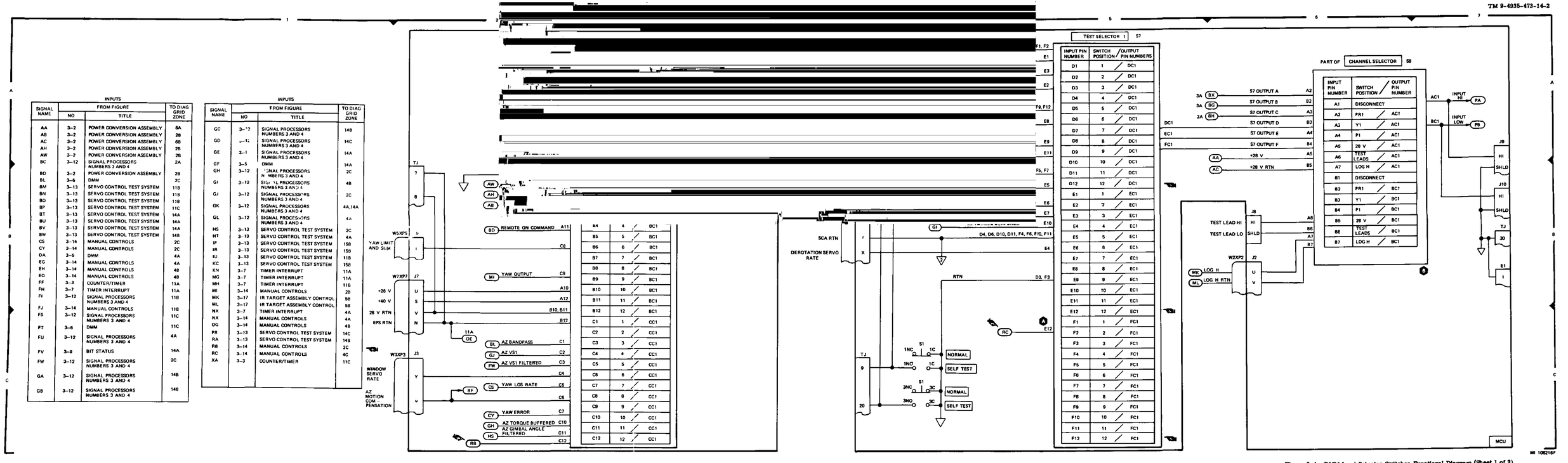


Figure 3-4. DMM Input Selector Switches Functional Diagram (Sheet 1 of 2)

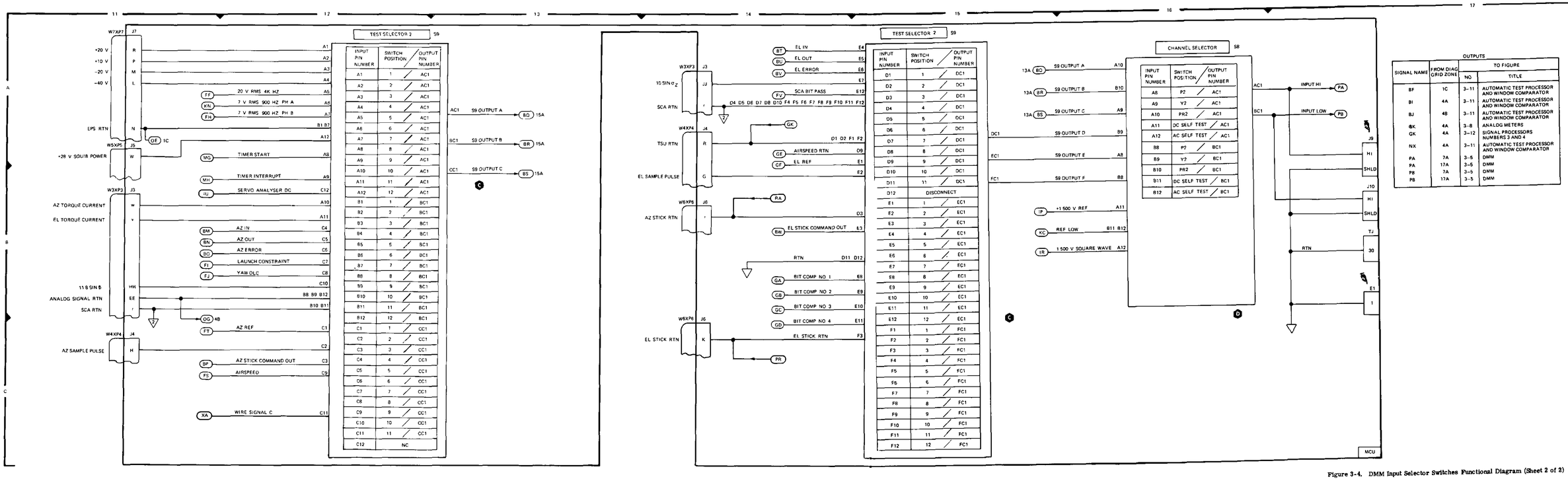


Figure 3-4. DMM Input Selector Switches Functional Diagram (Sheet 2 of 2)

INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
FD	3-10	AUTOMATIC TEST SELECTOR	4B
GR	3-10	AUTOMATIC TEST SELECTOR	4B
KI	3-15	INDICATOR LAMP DRIVERS	11C
PA	3-4	DMM INPUT SELECTOR SWITCHES	1A
PB	3-4	DMM INPUT SELECTOR SWITCHES	1A,3A

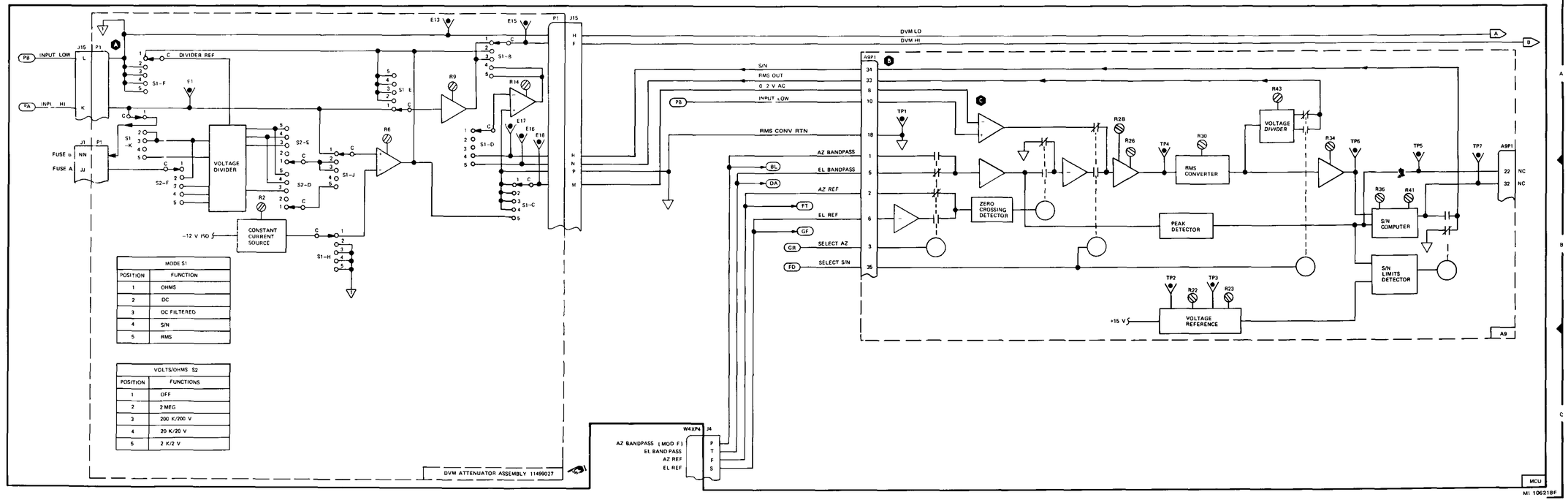
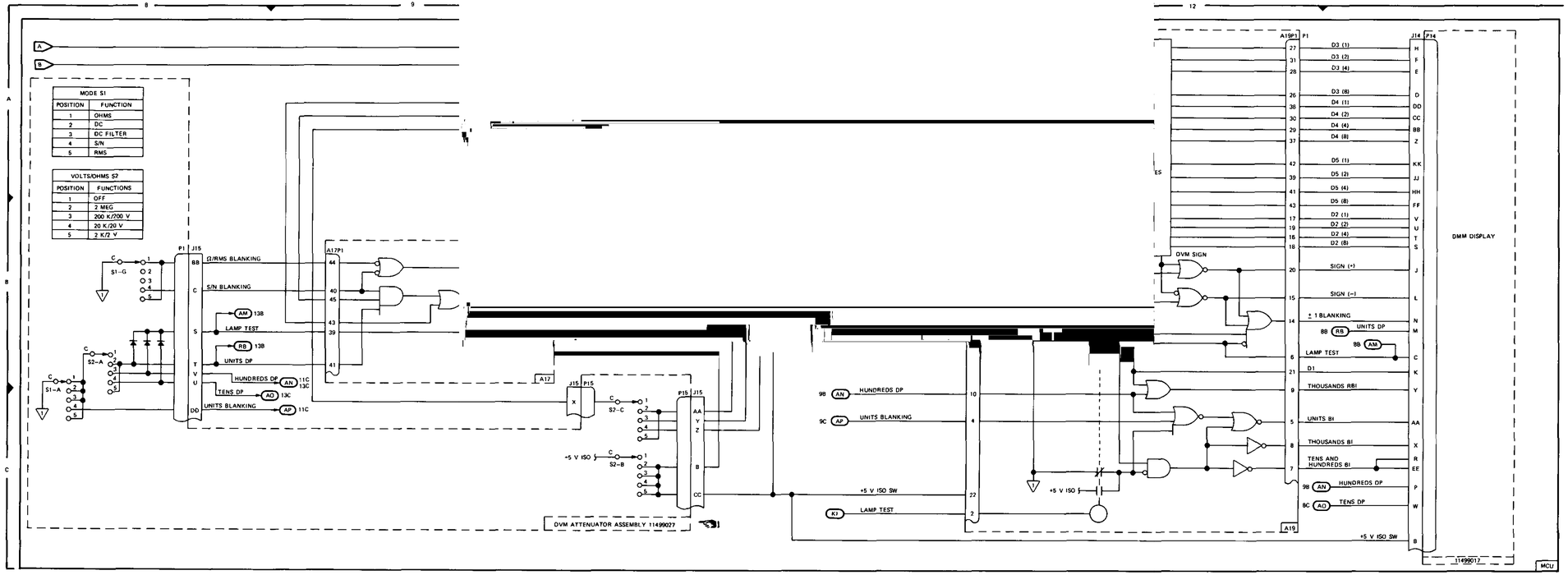


Figure 3-5. DMM Functional Diagram (Sheet 1 of 2)



OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
BL	4B	3-3	COUNTER/TIMER
ØL	4B	3-4	DMM INPUT SELECTOR SWITCHES
DA	4B	3-4	DMM INPUT SELECTOR SWITCHES
FT	4B		
GF	4B		

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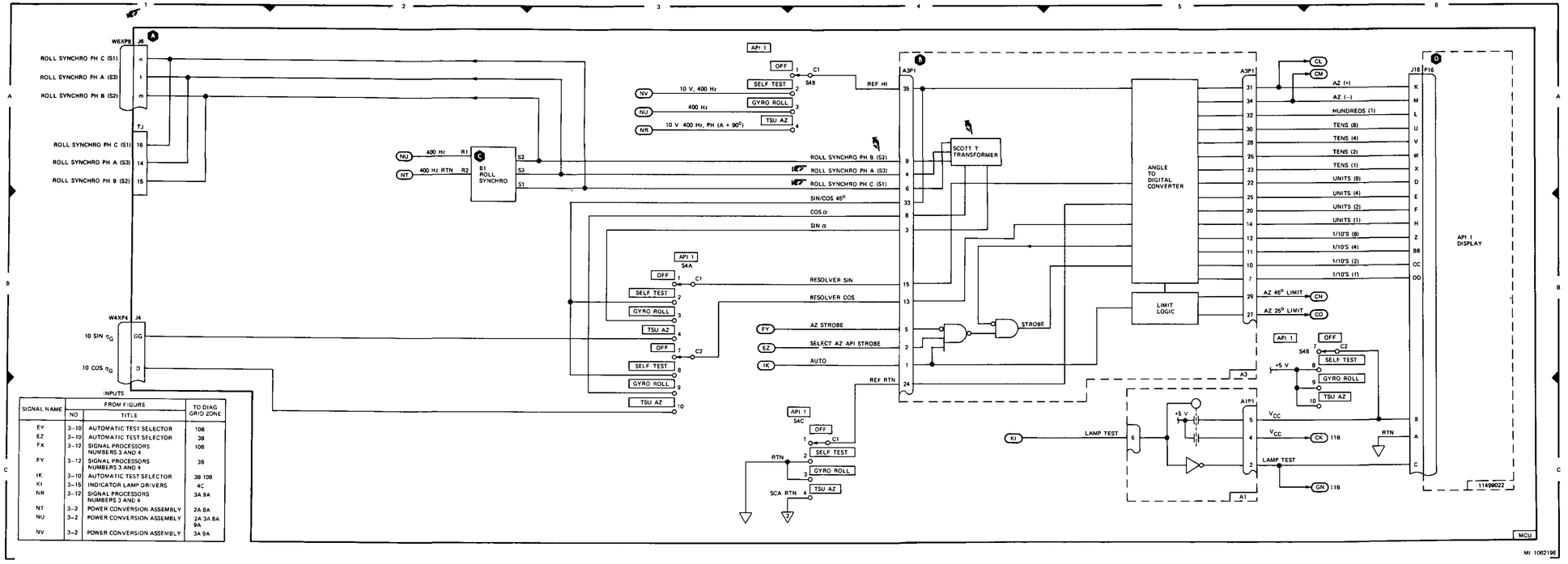
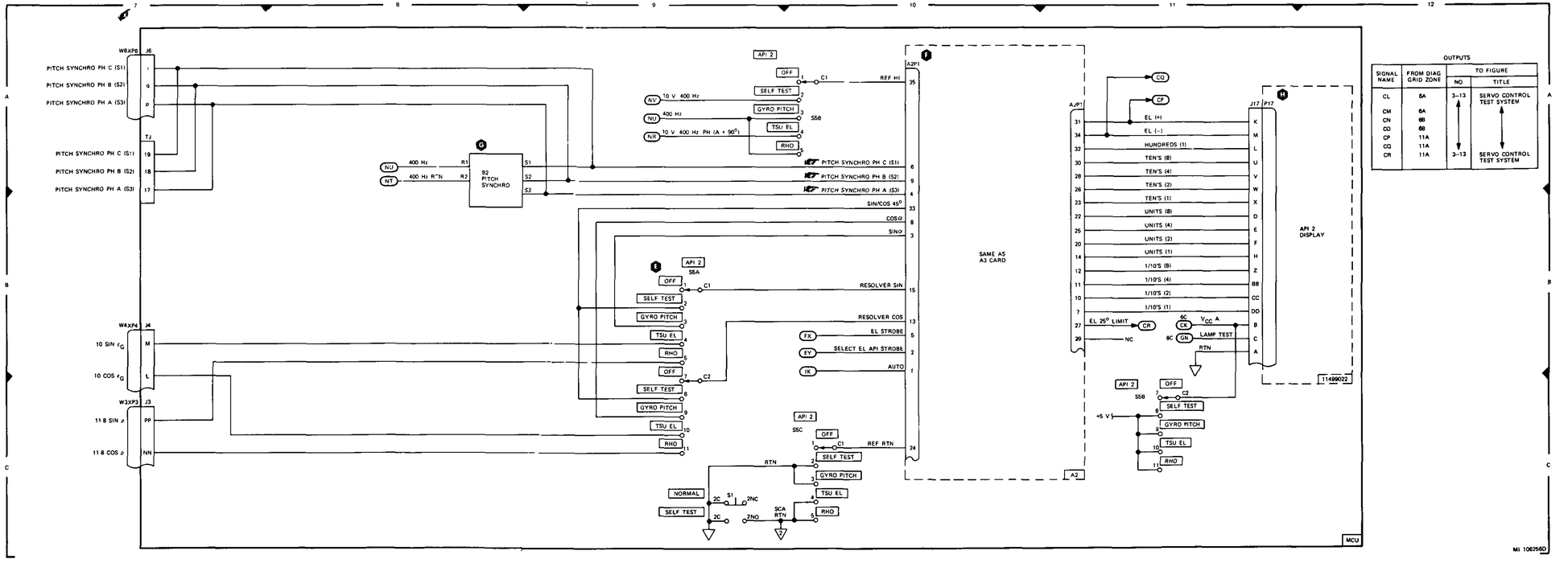
Figure 3-5. DMM Functional Diagram (Sheet 2 of 2)



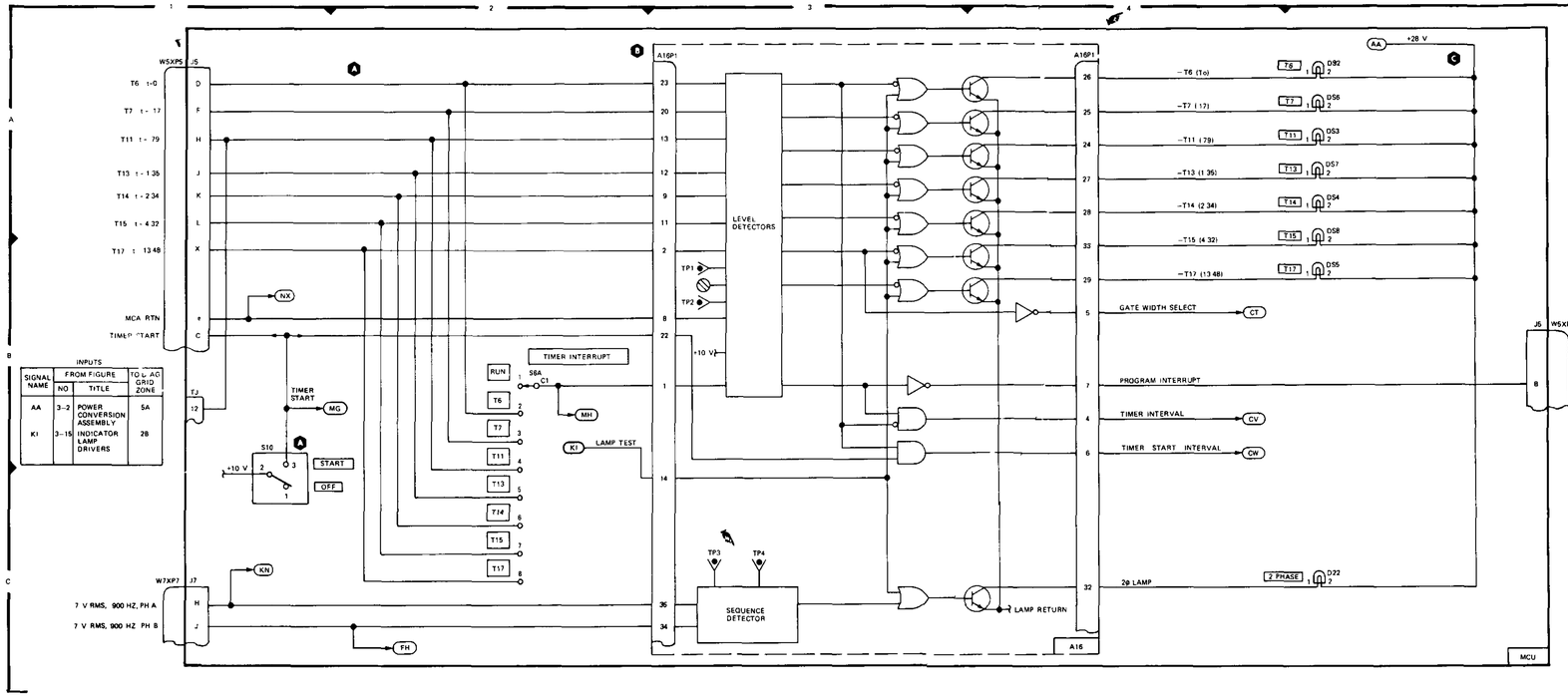
SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
EY	3–10	AUTOMATIC TEST SELECTOR	10B
EZ	3–10	AUTOMATIC TEST SELECTOR	3B
FX	3–12	SIGNAL PROCESSORS NUMBERS 3 AND 4	10B
FY	3–12	SIGNAL PROCESSORS NUMBERS 3 AND 4	3B
IK	3–10	AUTOMATIC TEST SELECTOR	3B 10B
KI	3–15	INDICATOR LAMP DRIVERS	4C
NR	3–12	SIGNAL PROCESSORS NUMBERS 3 AND 4	3A 9A
NT	3–2	POWER CONVERSION ASSEMBLY	2A 8A
NU	3–2	POWER CONVERSION ASSEMBLY	2A 3A 8A 9A
NV	3–2	POWER CONVERSION ASSEMBLY	3A 9A

Figure 3-6. Angle Indicators Functional Diagram (Sheet 1 of 2)



OUTPUTS			
SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE	
		NO	TITLE
CL	6A	3-13	SERVO CONTROL TEST SYSTEM
CM	6A		
CN	6B		
CO	6B		
CP	11A		
CQ	11A	3-13	SERVO CONTROL TEST SYSTEM
CR	11A		

Figure 3-6. Angle Indicators Functional Diagram (Sheet 2 of 2)



OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
CT	4B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
CV	4B	3-3	COUNTER/TIMER
CV	4B	3-17	IR TARGET ASSEMBLY CONTROL
CW	4B	3-3	COUNTER/TIMER
FH	2C	3-4	DMM INPUT SELECTOR SWITCHES
KN	1C	3-3	COUNTER/TIMER
KN	1C	3-4	DMM INPUT SELECTOR SWITCHES
MG	1B	3-4	DMM INPUT SELECTOR SWITCHES
MH	2B	3-4	DMM INPUT SELECTOR SWITCHES
NX	1B	3-4	DMM INPUT SELECTOR SWITCHES

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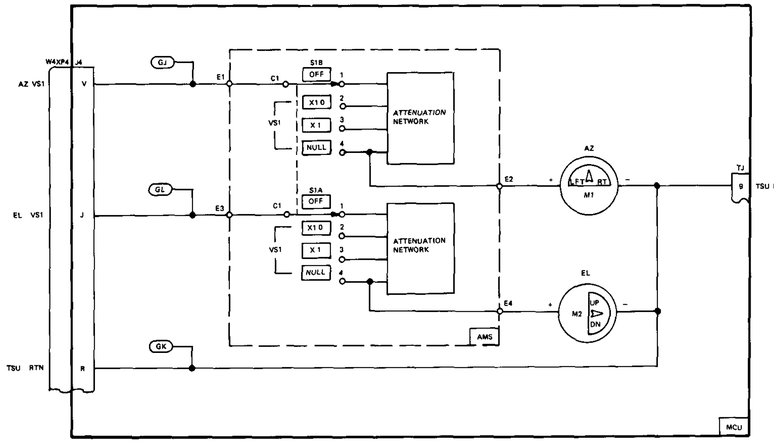
Figure 3-7. Timer Interrupt Functional Diagram



INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
GJ	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1A
GK	3-4	DMM INPUT SELECTOR SWITCHES	1B
GL	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1B

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Figure 3-8. Analog Meters Functional Diagram

INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
AA	3-2	POWER CONVERSION ASSEMBLY	9A 11A
FG	3-10	AUTOMATIC TEST SELECTOR	8C
K1	3-15	SERVO CONTROL TEST SYSTEM	8C

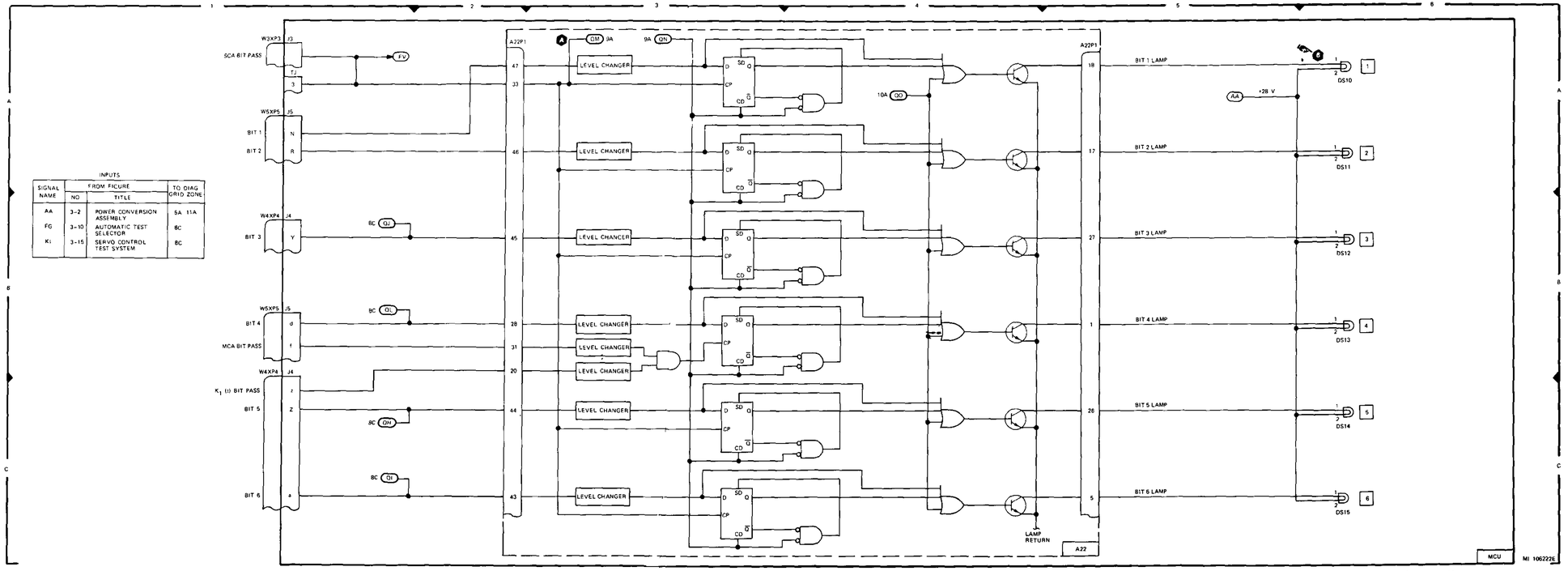
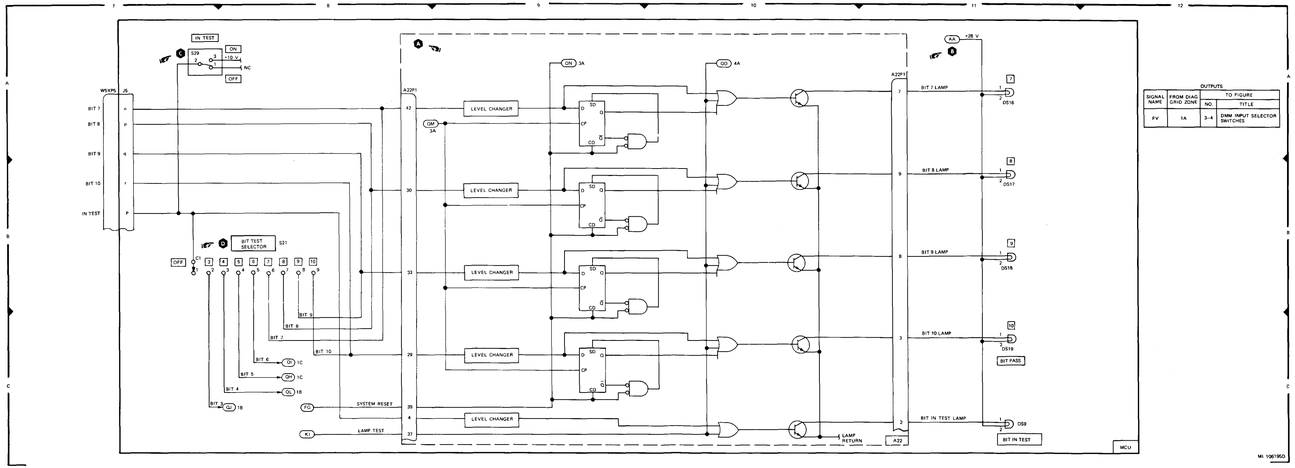


Figure 3-9. BIT Status Functional Diagram (Sheet 1 of 2)



OUTPUTS			
SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO FIGURE TITLE
P.V	1A	3-4	DMM INPUT SELECTOR SWITCHES

Figure 3-9. BIT Status Functional Diagram (Sheet 2 of 2)

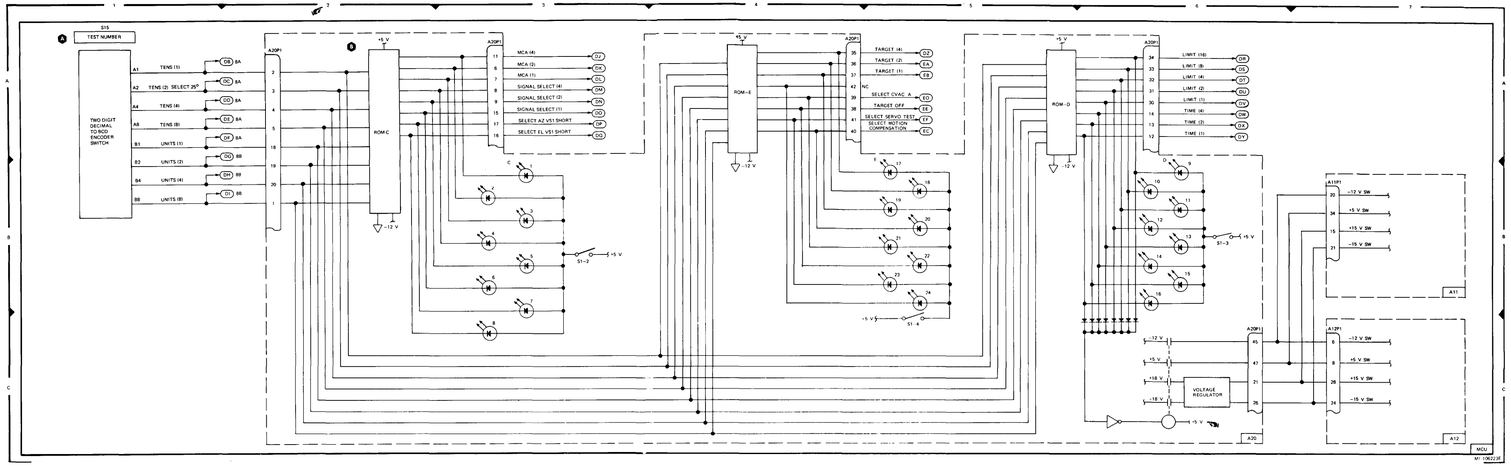
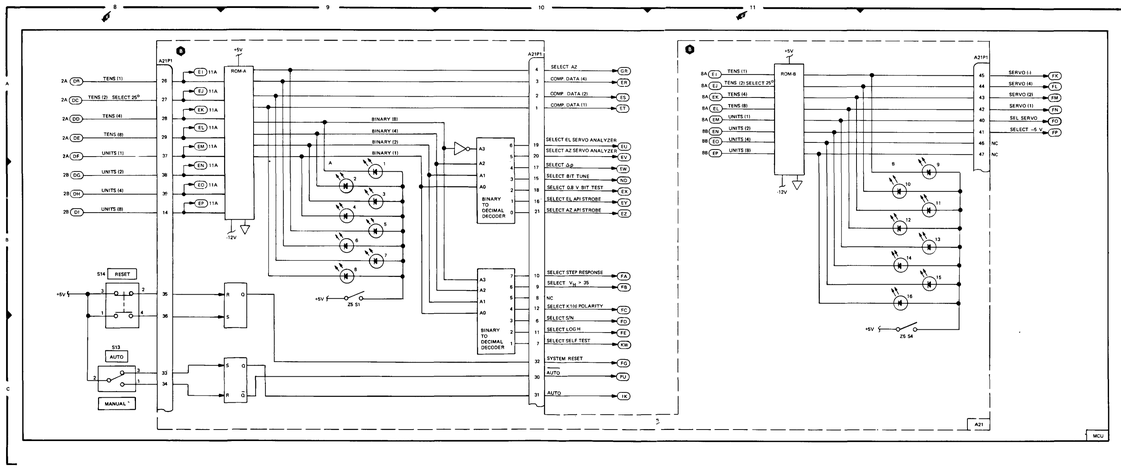


Figure 3-10. Automatic Test Selector Functional Diagram (Sheet 1 of 2)



SIGNAL NAME	FROM DIAG CP/O ZONE	OUTPUTS TO FIGURE NO.	TITLE
DC	2A	3-13	SERVO CONTROL TEST SYSTEM
DJ	3A	3-14	MANUAL CONTROLS
DK	3A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DK	3A	3-14	MANUAL CONTROLS
DL	3A	3-14	MANUAL CONTROLS
DM	3A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DN	3A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DO	3A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DP	3A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
DQ	3A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
DR	8A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DS	8A		
DT	6A		
DU	6A		
DV	6A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DV	8A	3-13	SERVO CONTROL TEST SYSTEM
DW	6A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DX	8A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DY	8A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
DZ	8A	3-17	IR TARGET ASSEMBLY CONTROL
EA	8A		
EB	8A		
EC	8A	3-17	IR TARGET ASSEMBLY CONTROL
EC	8A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
EC	8A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
EC	8A	3-13	SERVO CONTROL TEST SYSTEM
EE	8A	3-17	IR TARGET ASSEMBLY CONTROL
EF	8A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
EG	8A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
ER	10A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
ES	10A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
ET	10A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
EU	10B	3-13	SERVO CONTROL TEST SYSTEM
EV	10B	3-13	SERVO CONTROL TEST SYSTEM

SIGNAL NAME	FROM DIAG CP/O ZONE	OUTPUTS TO FIGURE NO.	TITLE
EW	10B	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
EX	10B	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
EY	10B	3-8	ANGLE INDICATORS
EZ	10B	3-8	ANGLE INDICATORS
FA	10B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
FA	10B	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
FB	10B	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
FC	10B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
FD	10C	3-5	DMM
FD	10C	3-12	SIGNAL PROCESSOR NUMBERS 3 AND 4
FE	10C	3-12	SIGNAL PROCESSOR NUMBERS 3 AND 4
FE	10C	3-17	IR TARGET ASSEMBLY CONTROL
FG	10C	3-3	COUNTER/TIMER
FG	10C	3-9	BIT STATUS
FG	10C	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
FG	10C	3-13	SERVO CONTROL TEST SYSTEM
FK	12A		
FL	12A		
FM	12A		
FN	12A	3-13	SERVO CONTROL TEST SYSTEM
FQ	12A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
FP	12A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
GR	10A	3-5	DMM
GR	10A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
GR	10A	3-13	SERVO CONTROL TEST SYSTEM
GR	10A	3-14	MANUAL CONTROLS
IK	10C	3-8	ANGLE INDICATORS
IK	10C	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
IK	10C	3-13	SERVO CONTROL TEST SYSTEM
IK	10C	3-14	MANUAL CONTROLS
IK	10C	3-17	IR TARGET ASSEMBLY CONTROL
KV	10C	3-15	INDICATOR LAMP DRIVERS
KW	10C	3-17	IR TARGET ASSEMBLY CONTROL
NO	10B	3-16	TSU GIMBAL CONTROL AND MANUAL BORESIGHT CONTROLS
PU	10C	3-15	INDICATOR LAMP DRIVERS

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Figure 3-10. Automatic Test Selector Functional Diagram (Sheet 2 of 2)

INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG. SERVO ZONE
BF	3-4	DMM INPUT SELECTOR SWITCHES	1B
BF	3-4	DMM INPUT SELECTOR SWITCHES	1B
BJ	3-4	DMM INPUT SELECTOR SWITCHES	1B
CT	3-7	TIMER INTERRUPT	12B
DK	3-10	AUTOMATIC TEST SELECTOR	1C
DM			1C
DN			1C
DO			1C
DR			6B
DS			6B
DT			6B
DU			6B
DV			6B
DW			12B
DX			12B
DY			12B
EC			6B
EO			12A
FA			12C
FC			1A
FG			6B, 12A
FO	3-10	AUTOMATIC TEST SELECTOR	6B
FU	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1A
FW	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1A
GR	3-10	AUTOMATIC TEST SELECTOR	1B
IP	3-13	SERVO CONTROL TEST SYSTEM	1C
IU	3-13	SERVO CONTROL TEST SYSTEM	1C
JM	3-14	MANUAL CONTROLS	1B
JN	3-14	MANUAL CONTROLS	1B
JO	3-14	MANUAL CONTROLS	1B
JR	3-17	IR TARGET ASSEMBLY CONTROL	12A
JS	3-17	IR TARGET ASSEMBLY CONTROL	12B
LD	3-15	INDICATOR LAMP DRIVERS	12B
NX	3-4	DMM INPUT SELECTOR SWITCHES	1B
PC	3-14	MANUAL CONTROLS	1B

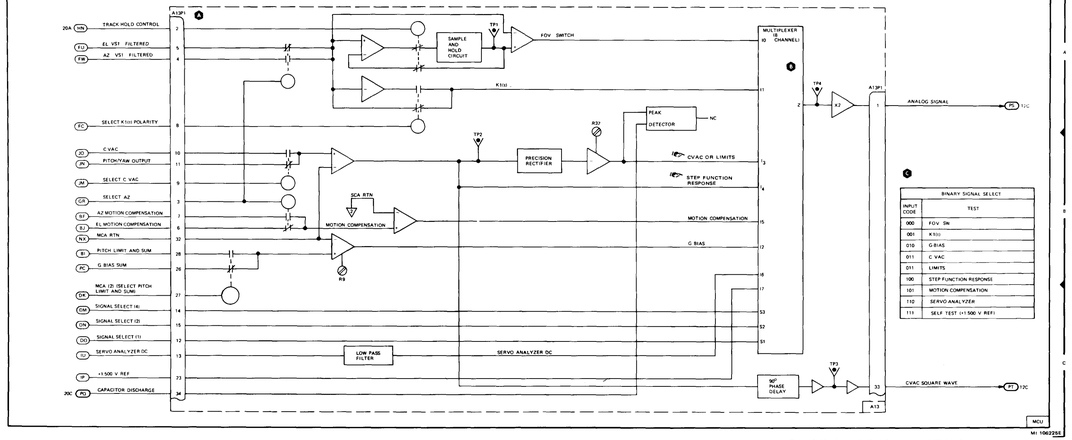

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Figure 3-11. Automatic Test Processor and Window Comparator Functional Diagram (Sheet 1 of 3)

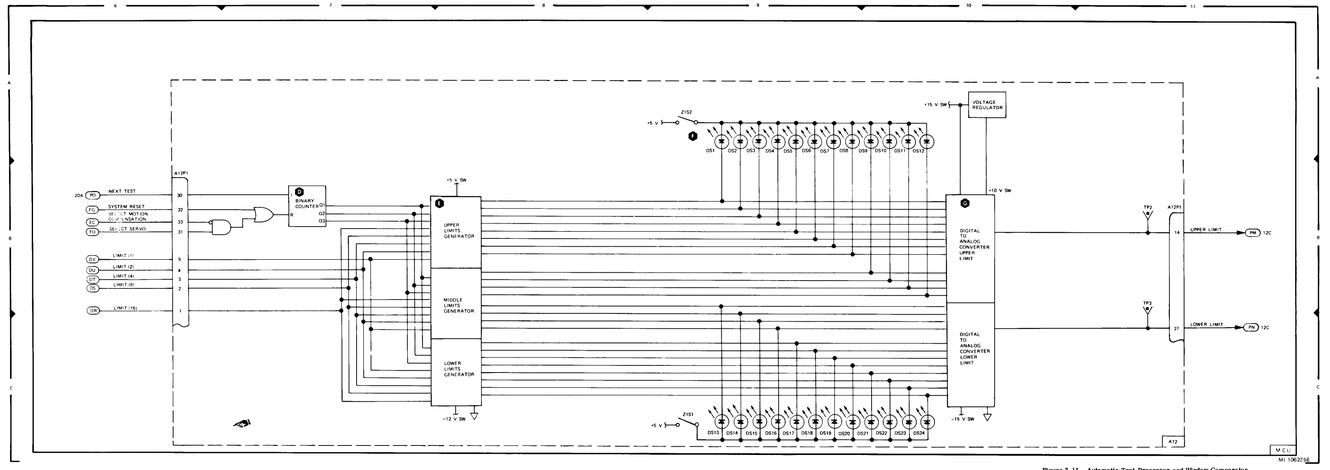

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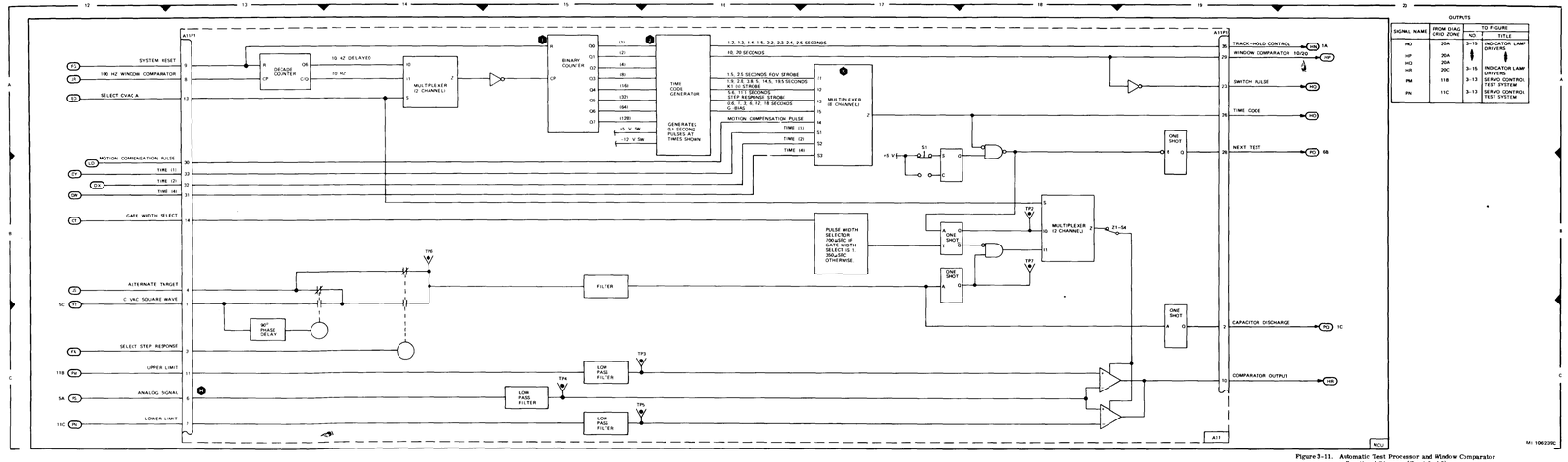
Figure 3-11. Automatic Test Processor and Window Comparator Functional Diagram (Sheet 2 of 3)



OUTPUTS			
SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO TITLE
HO	20A	3-15	INDICATOR LAMP DRIVERS
HP	20A		
HQ	20A	3-15	INDICATOR LAMP DRIVERS
HR	20C		
PM	11B	3-13	SERVO CONTROL TEST SYSTEM
PN	11C	3-13	SERVO CONTROL TEST SYSTEM

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Figure 3-11. Automatic Test Processor and Window Comparator Functional Diagram (Sheet 3 of 3)

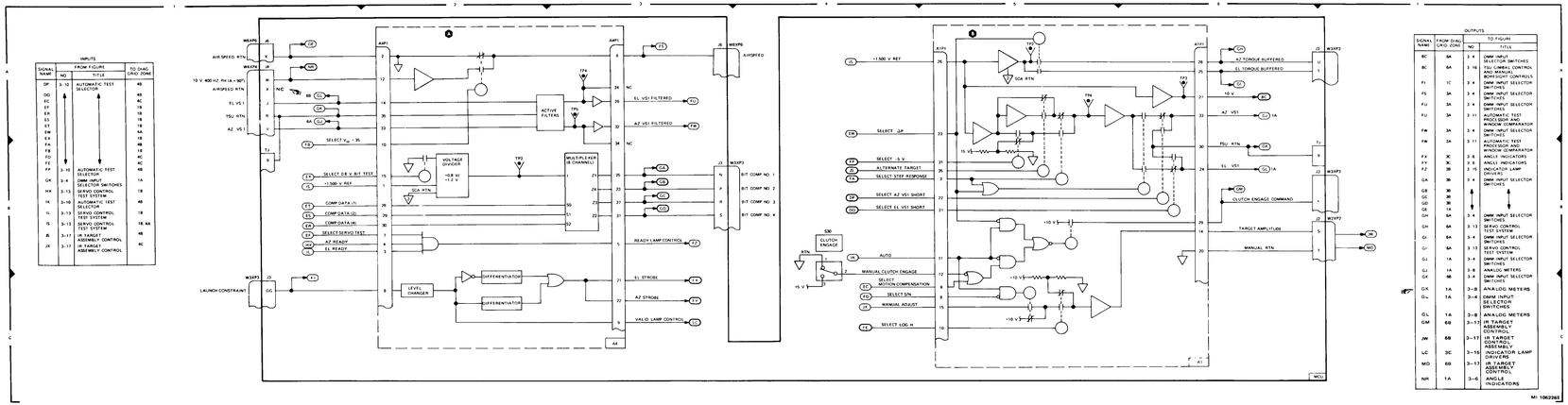


Figure 3-12. Signal Processors Numbers 3 and 4 Functional Diagram

SIGNAL NAME	INPUTS FROM FIGURE NO	INPUTS FROM FIGURE TITLE	TO DIAG GRID ZONE
CL	3-6	ANGLE INDICATORS	1B
CM			1B
CN			1B
CO			1B
CP			1B
CQ			1A
CR	3-8	ANGLE INDICATORS	1A
DC	3-10	AUTOMATIC TEST SELECTOR	1B
DV			1B
EC			3C, 7C
EU			11C
EV			11B
FG			1B
FK			3B, 7B
FL			3B, 1B
FM			3B, 7B
FN	3-10	AUTOMATIC TEST SELECTOR	3C, 7B
GG	3-2	POWER CONVERSION ASSEMBLY	1B
GH	3-12	SIGNAL PROCESSORS NUMBERS 1 AND 4	1C
GI	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1C
GR	3-10	AUTOMATIC TEST SELECTOR	3C, 11C
HK	3-10	AUTOMATIC TEST SELECTOR	3C, 7C
KU	3-17	IR TARGET ASSEMBLY CONTROL	3C, 7C
NU	3-2	POWER CONVERSION ASSEMBLY	1C
PM	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR	3A, 1A
PN	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR	3B, 7B

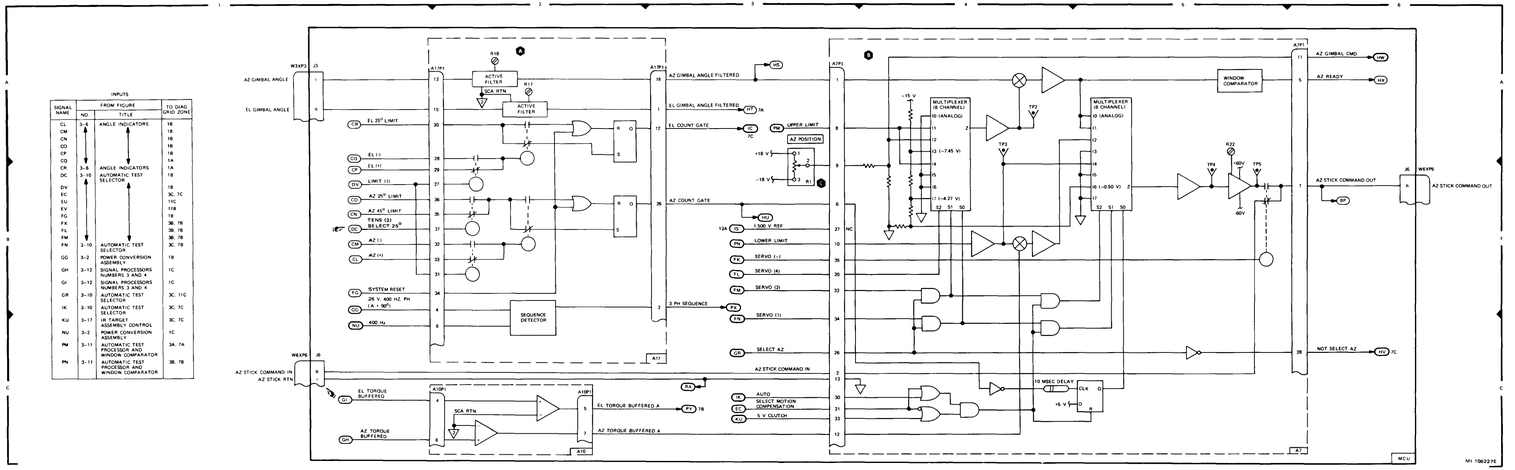
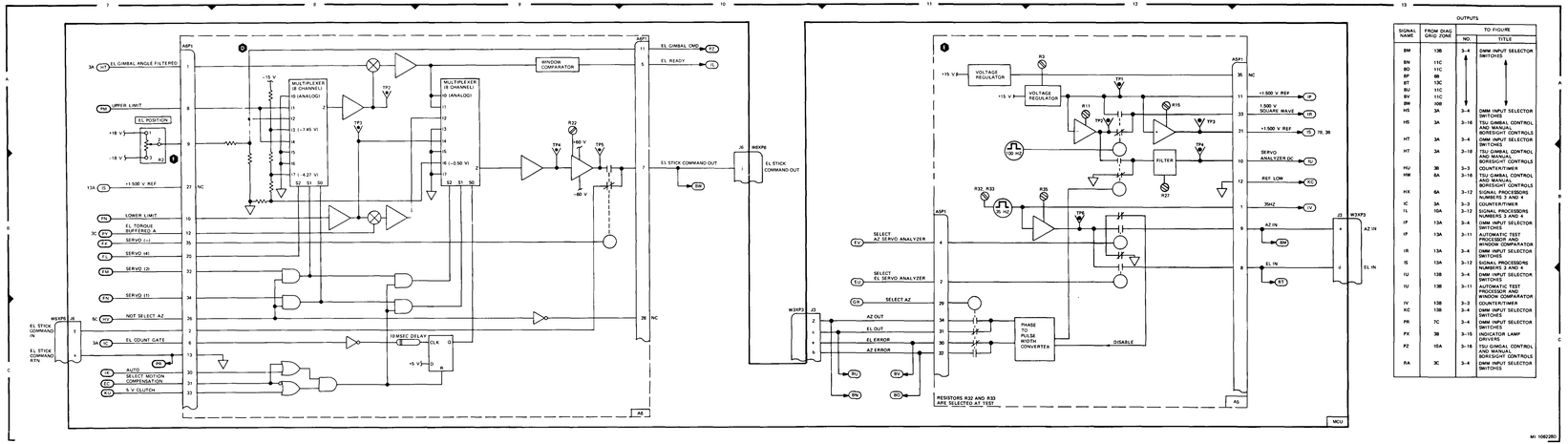


Figure 3-13. Servo Control Test System Functional Diagram (Sheet 1 of 2)



SIGNAL NAME	FROM DIAG GRID ZONE	OUTPUTS TO FIGURE NO.	OUTPUTS TO FIGURE TITLE
BM	13B	3-4	DMM INPUT SELECTOR SWITCHES
BN	11C		
BO	11C		
BP	8B		
BT	13C		
BU	11C		
BV	11C		
BW	10B		
HS	3A	3-4	DMM INPUT SELECTOR SWITCHES
HS	3A	3-16	TSU GIMBAL CONTROL AND MANUAL BORESIGHT CONTROLS
HT	3A	3-4	DMM INPUT SELECTOR SWITCHES
HT	3A	3-16	TSU GIMBAL CONTROL AND MANUAL BORESIGHT CONTROLS
HU	3B	3-3	COUNTER/TIMER
HW	6A	3-16	TSU GIMBAL CONTROL AND MANUAL BORESIGHT CONTROLS
HX	6A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
IC	3A	3-3	COUNTER/TIMER
IL	10A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
IP	13A	3-4	DMM INPUT SELECTOR SWITCHES
IP	13A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
IR	13A	3-4	DMM INPUT SELECTOR SWITCHES
IS	13A	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4
IU	13B	3-4	DMM INPUT SELECTOR SWITCHES
IU	13B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
IV	13B	3-3	COUNTER/TIMER
KC	13B	3-4	DMM INPUT SELECTOR SWITCHES
PR	7C	3-4	DMM INPUT SELECTOR SWITCHES
PX	3B	3-15	INDICATOR LAMP DRIVERS
PZ	10A	3-16	TSU GIMBAL CONTROL AND MANUAL BORESIGHT CONTROLS
RA	3C	3-4	DMM INPUT SELECTOR SWITCHES

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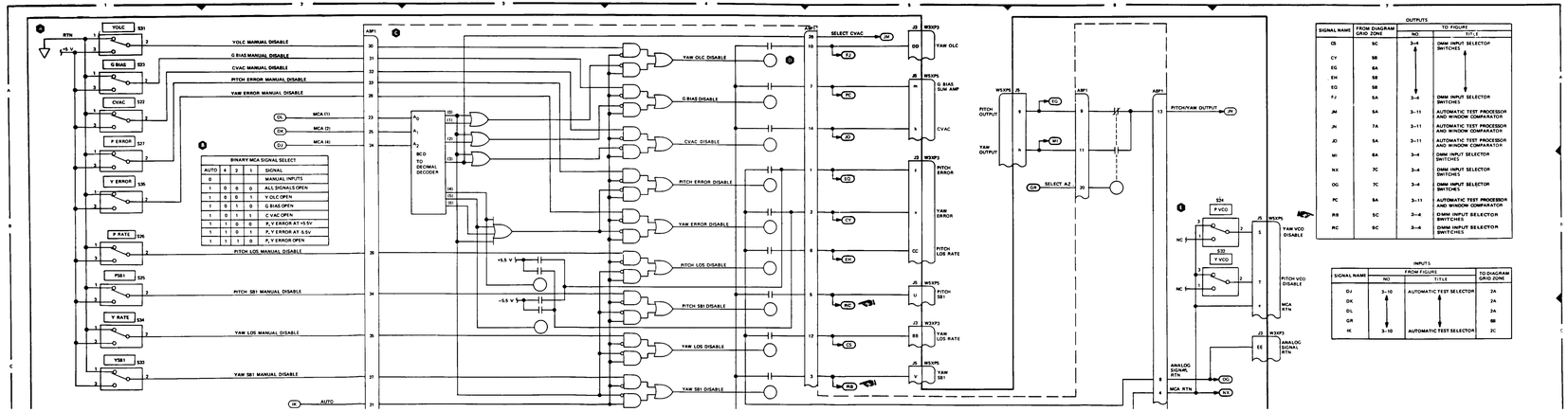
Figure 3-13. Servo Control Test System Functional Diagram (Sheet 2 of 2)

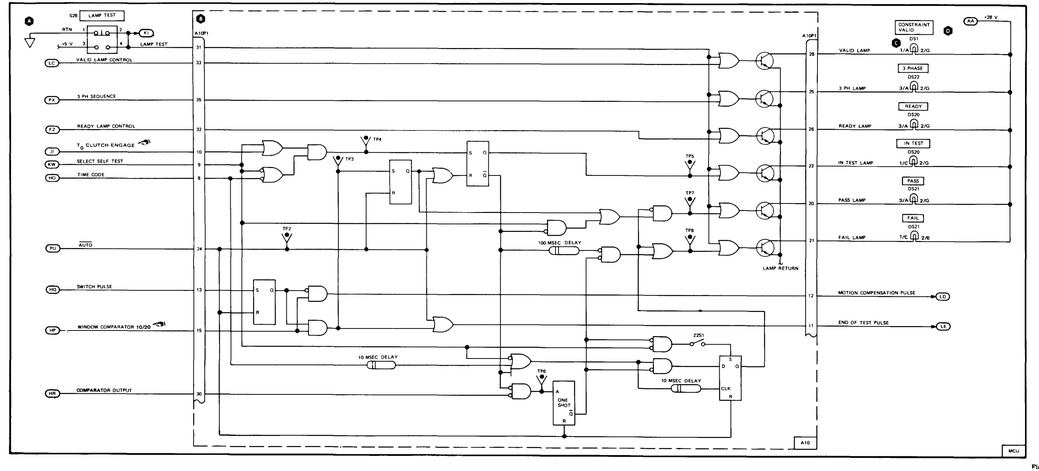


SIGNAL NAME	FROM DIAGRAM GRID ZONE	OUTPUTS TO FIGURE NO	OUTPUTS TO FIGURE TITLE
CS	5C	3-4	DMM INPUT SELECTOR SWITCHES
CY	5B		
EG	6A		
EH	5B		
EQ	5B		
FJ	5A	3-4	DMM INPUT SELECTOR SWITCHES
JM	5A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
JN	7A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
JO	5A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
MJ	6A	3-4	DMM INPUT SELECTOR SWITCHES
NX	7C	3-4	DMM INPUT SELECTOR SWITCHES
OG	7C	3-4	DMM INPUT SELECTOR SWITCHES
PC	6A	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
RB	5C	3-4	DMM INPUT SELECTOR SWITCHES
RC	6C	3-4	DMM INPUT SELECTOR SWITCHES

SIGNAL NAME	INPUTS FROM FIGURE NO	INPUTS FROM FIGURE TITLE	TO DIAGRAM GRID ZONE
OJ	3-10	AUTOMATIC TEST SELECTOR	2A
OK			2A
OL			2A
GR			6B
HK	3-10	AUTOMATIC TEST SELECTOR	2C

INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	FROM DIAG GRID ZONE
AA	3-2	POWER CONVERSION ASSEMBLY	5A
FZ	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1A
HO	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR	1B
HP	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR	1C
HQ			1B
HR			1C
JI	3-17	AUTOMATIC TEST ASSEMBLY CONTROL	1B
KM	3-10	AUTOMATIC TEST SELECTOR	1B
LC	3-13	SIGNAL PROCESSORS NUMBERS 3 AND 4	1A
PU	3-10	AUTOMATIC TEST SELECTOR	1B
PX	3-13	SERVO CONTROL TEST SYSTEM	1A



OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
K1	1A	3-3	COUNTER/TIMER
K1	1A	3-5	DMM
K1	1A	3-6	ANGLE INDICATORS
K1	1A	3-7	TIMER INTERRUPT
K1	1A	3-9	BIT STATUS
LD	5B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
LE	9C	3-17	IR TARGET ASSEMBLY CONTROL

Figure 3-15. Indicator Lamp Drivers Functional Diagram

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INPUTS			
SIGNAL NAME	FROM FIGURE NO.	TITLE	TO DIAG GRID ZONE
BC	3-12	SIGNAL PROCESSORS NUMBERS 2 AND 4	3A
HS	3-13	SERVO CONTROL TEST SYSTEM	1C
HT	3-13	SERVO CONTROL TEST SYSTEM	1C
HW	3-13	SERVO CONTROL TEST SYSTEM	1A
ND	3-10	AUTOMATIC TEST SELECTOR	3C
FZ	3-13	SERVO CONTROL TEST SYSTEM	1B

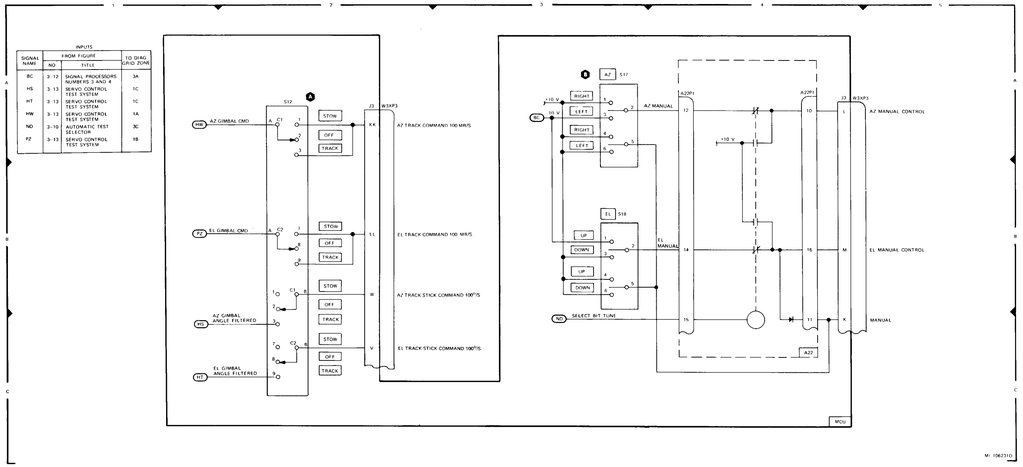

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Figure 3-16. TSU Gimbal Control and Manual Boresight Controls Functional Diagram

INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
AD	3-2	POWER CONVERSION ASSEMBLY	7B
AE	↕	↕	7B
AF	↕	↕	7B
AG	3-2	POWER CONVERSION ASSEMBLY	7B
CV	3-7	TIMER INTERRUPT	1C
DZ	3-10	AUTOMATIC TEST SELECTOR	1A
EA	↕	↕	1A
EB	↕	↕	1A
EC	↕	↕	1C
EE	↕	↕	1A
FE	3-10	AUTOMATIC TEST SELECTOR	1C
GM	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	1C
IK	3-10	AUTOMATIC TEST SELECTOR	1B
JW	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	7B
KW	3-10	AUTOMATIC TEST SELECTOR	1B
LE	3-15	INDICATOR LAMP DRIVERS	1C
MB	3-2	POWER CONVERSION ASSEMBLY	7B
MD	3-12	SIGNAL PROCESSORS NUMBERS 3 AND 4	7B

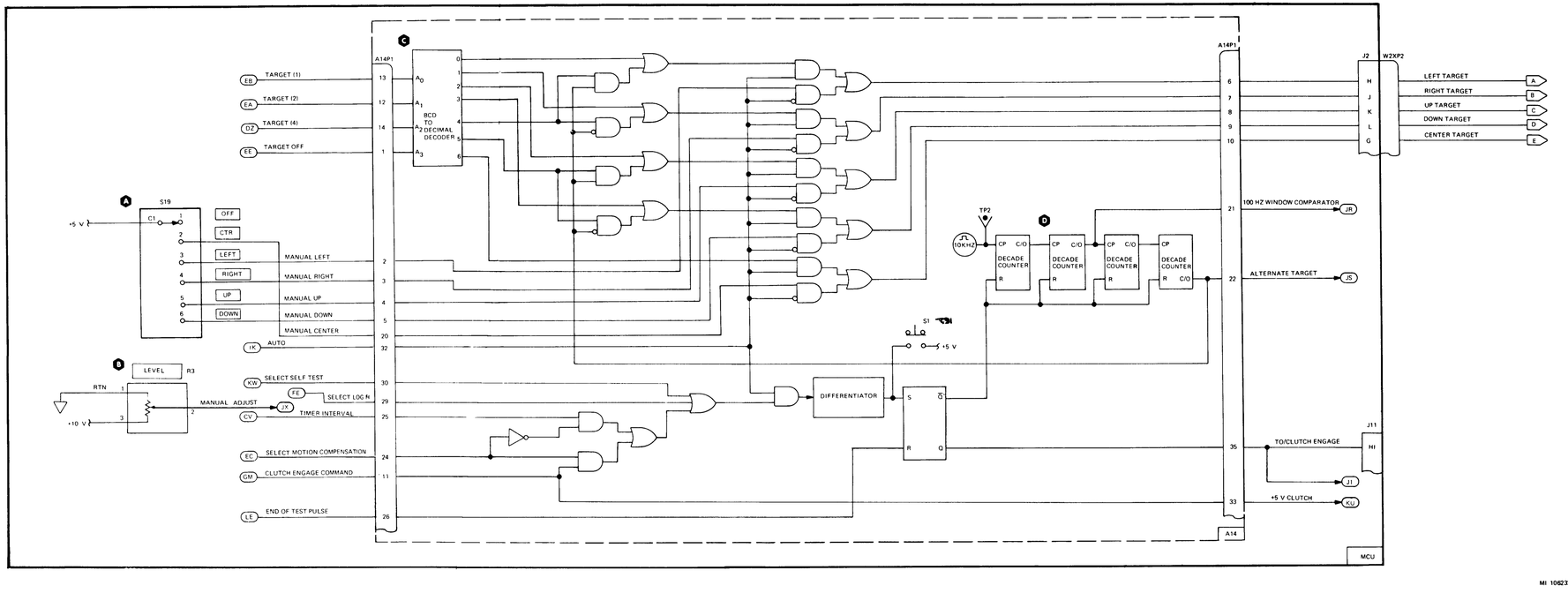

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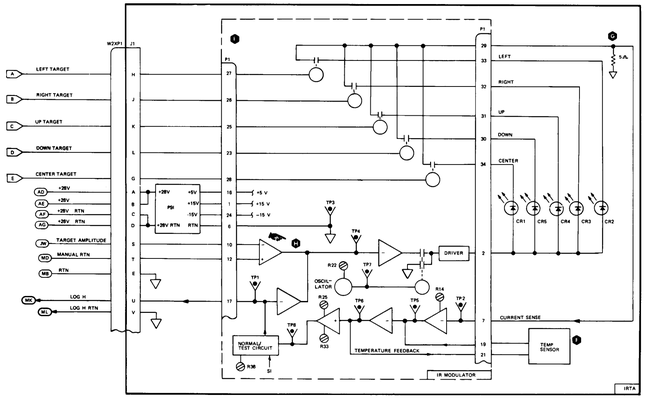
Figure 3-17. IR Target Assembly Control Functional Diagram (Sheet 1 of 2)



OUTPUTS			
SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TITLE
JF	5C	3-15	INDICATOR LAMP DRIVERS
JH	5B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
JS	5B	3-11	AUTOMATIC TEST PROCESSOR AND WINDOW COMPARATOR
JS	5B	3-12	SIGNAL PROCESSORS NUMBERS 1 AND 3
JX	2C	3-12	SIGNAL PROCESSORS NUMBERS 2 AND 4
KU	5C	3-13	SERVO CONTROL TEST SYSTEM
MK	7C	3-4	DMM INPUT SELECTOR SWITCHES
ML	7C	3-4	DMM INPUT SELECTOR SWITCHES

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Figure 3-17. IR Target Assembly Control Functional Diagram (Sheet 2 of 2)

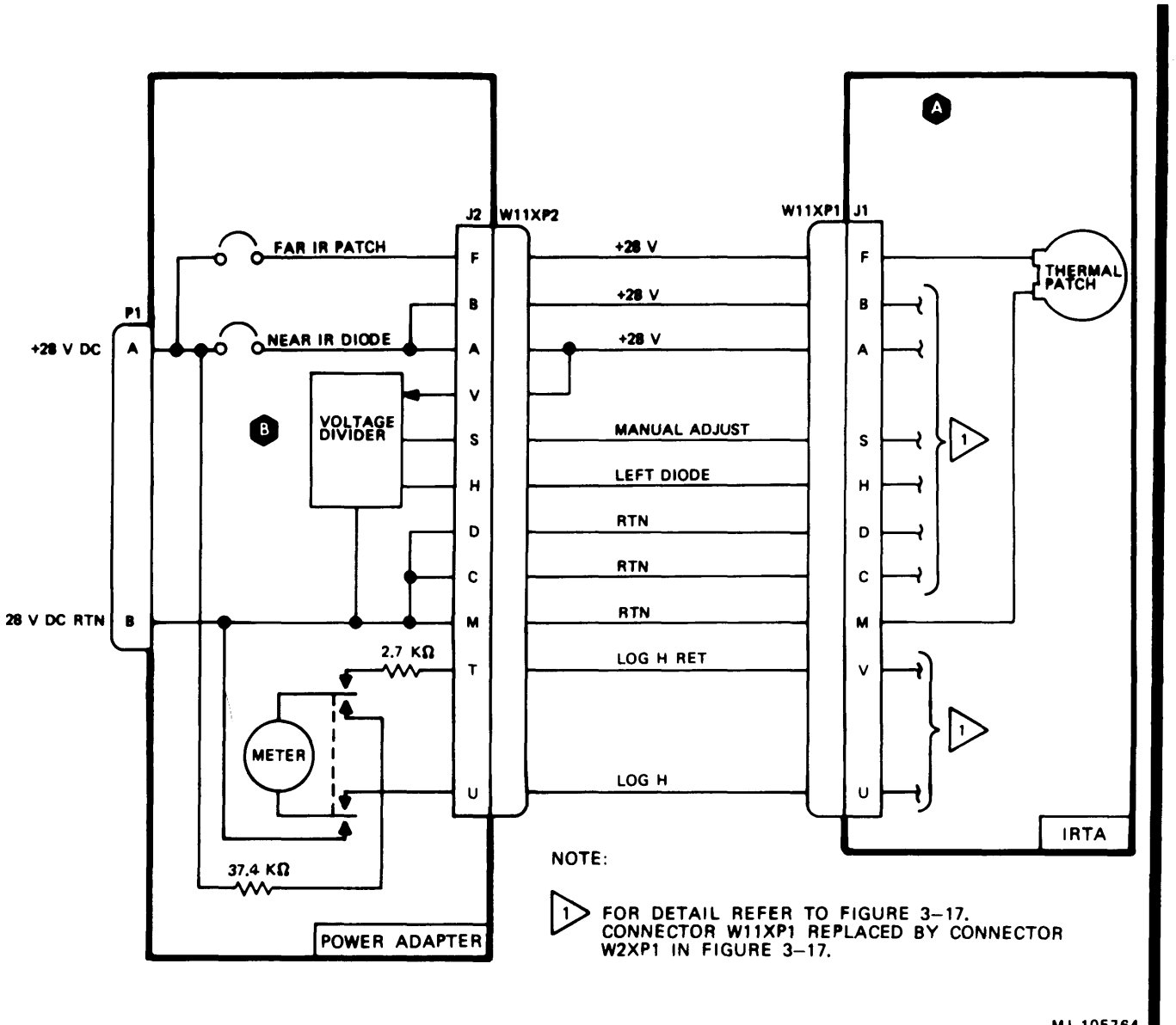


Figure 3-17.1. C-NITE IR Target Assembly Control Functional Diagram

3-3.1 Control Monitor Wire List.

CAUTION

Exercise care when connecting and disconnecting cables to prevent damage to equipment due to electrostatic discharge and erroneous connections. Prior to connecting or disconnecting cables, be sure all power is turned off and that sources of electrostatic charge are not present at either end of the cables. Since the majority of the pins on each cable lead to components which are ESD, personnel must not touch, or otherwise allow static charges to reach the exposed pins of connector cables. A protective cap must be installed on any connector when cable is disconnected.

The tabular list of the control monitor interconnection wiring is given in table 3-2. The From column lists the origin of the wire and the To column lists the termination of the wire.

Table 3-2. Control Monitor Wire List

From		To		Signal Name
9031	E1	XA4	33	Az VS1
9031	E2	M1	+	Az meter
9031	E3	XA4	14	El VS1
9031	E4	M2	+	El meter
B1	R1	S4B	3	400 Hz
B1	R1	XA17	6	400 Hz
B1	R1	B2	R1	400 Hz
B1	R1	S1	4C	400 Hz
B1	R2	XA3	18	PH A rtn
B1	R2	P12	c	PH A rtn
B1	R2	B2	R2	PH A rtn
B1	S1	XA3	6	Roll synchro ph C (S1)
B1	S2	XA3	9	Roll synchro ph B (S2)
B1	S3	XA3	4	Roll synchro ph A (S3)
B2	R1	E2		400 Hz
B2	R1	B1	R1	400 Hz
B2	R2	B1	R2	PH A rtn
B2	R2	E3		PH A rtn
B2	S1	XA2	6	Pitch synchro ph C
B2	S2	XA2	9	Pitch synchro ph B
B2	S3	XA2	4	Pitch synchro ph A
C1	A	TB2	2	115 V, 400 Hz, ph CB
C1	B	TB2	3	115 V, 400 Hz, ph B (GND)
C2	A	TB2	5	115 V, 400 Hz, ph AB
C2	B	TB2	4	115 V, 400 Hz, ph B (GND)
CB1	LINE	J1	A	+28 V PRIME
CB1	LOAD	DS23	2	Power on
CB1	LOAD	CB2	LINE	Power on
CB1	LOAD	CB3	LINE	Power on

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
CB2	LINE	CB1	LOAD	Power on
CB2	LINE	TB1	2	+28 V
CB2	LOAD	J6	e	Remote on command
CB2	LOAD	S7A	11	Remote on command
CB3	LINE	CB1	LOAD	Power on
CB3	LOAD	SPLICE	1	Power on
CR1	CATH	J1	B	28 V RTN
CR1	ANOD	TB1	3	28 V RTN
DS1	01/A	XA10	28	Valid lamp
DS1	02/G	TB1	2	+28 V
DS1	02/G	DS2	2	+28 V
DS2	1	XA16	26	-T6 (T0)
DS2	2	DS1	02/G	+28 V
DS2	2	DS3	2	+28 V
DS3	1	XA16	24	-T11(.79)
DS3	2	DS2	2	+28 V
DS3	2	DS4	2	+28 V
DS4	1	XA16	28	-T14 (2.34)
DS4	2	DS3	2	+28 V
DS4	2	DS5	2	+28 V
DS5	1	XA16	29	- T17 (13.48)
DS5	2	DS4	2	+28 V
DS5	2	DS6	2	+28 V
DS6	1	XA16	25	-T7 (.17)
DS6	2	DS5	2	+28V
DS6	2	DS7	2	+28 V
DS7	1	XA16	27	-T13 (1. 35)
DS7	2	DS6	2	+28 V
DS7	2	DS8	2	+28 V
DS8	1	XA16	33	-T15 (4.32)
DS8	2	DS7	2	+28 V
DS8	2	DS9	2	+28 V
DS9	1	XA22	2	BIT in test lamp

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
DS9	2	DS8	2	+28 V
DS9	2	DS10	2	+28 V
DS10	1	XA22	18	BIT 1 lamp
DS10	2	DS9	2	+28 V
DS10	2	DS1l	2	+28 V
DSll	1	XA22	17	BIT 2 lamp
DS1l	2	DS10	2	+28 V
DS1l	2	DS12	2	+28 V
DS12	1	XA22	27	BIT 3 lamp
DS12	2	DSll	2	+28 V
DS12	2	DS13	2	+28 V
DS13	1	XA22	1	BIT 4 lamp
DS13	2	DS12	2	+28 V
DS13	2	DS14	2	+28 V
DS14	1	XA22	26	BIT 5 lamp
DS14	2	DS13	2	+28 V
DS14	2	DS15	2	+28 V
DS15	1	XA22	5	BIT 6 lamp
DS15	2	DS14	2	+28 V
DS15	2	DS16	2	+28 V
DS16	1	XA22	7	BIT 7 lamp
DS16	2	DS15	2	+28 V
DS16	2	DS17	2	+28 V
DS17	1	XA22	9	BIT 8 lamp
DS17	2	DS16	2	+28 V
DS17	2	DS18	2	+28 V
DS18	1	XA22	8	BIT 9 lamp
DS18	2	DS17	2	+28 V
DS18	2	DS19	2	+28 V
DS19	1	XA22	3	BIT 10 lamp

Table 3-2. Control Monitor Wire List- Continued

From		To		Signal Name
DS19	2	DS18	2	+28 V
DS19	2	DS20	02/G	+28 V
DS20	03/A	XA10	26	Ready lamp
DS20	01/C	XA10	22	In test lamp
DS20	02/G	DS19	2	+28 V
DS20	02/G	DS21	02/G	+28 V
DS21	03/A	XA10	20	Pass lamp
DS21	01/C	XA10	21	Fail lamp
DS21	02/G	DS20	02/G	+28 V
DS21	02/G	DS22	02/G	+28 V
DS22	03/A	XA10	25	3 phase lamp
DS22	01/C	XA16	32	2 phase lamp
DS22	02/G	DS21	02/G	+28 V
DS23	2	CB1	LOAD	Power on
DS23	1	S8B	5	28 V rtn
El	1	P12	m	Shield gnd
El	1	S1	lC	Rtn
El	1	TJ	30	TSGMS rtn
El	1	XA4	18	Rtn
El	1	TB1	4	28 V rtn
El		B1	R1 SH	Shield gnd
El		J6	m SH	Shield gnd
El		J6	n SH	Shield gnd
El		J6	p SH	Shield gnd
El		J6	q SH	Shield gnd
El		J6	r SH	Shield gnd
El		J6	t SH	Shield gnd
El		J7	F SH	Shield gnd

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
E1		J7	H SH	Shield gnd
E1		J7	J SH	Shield gnd
E1		P12	C SH	Shield gnd
E1		P12	E SH	Shield gnd
E1		P12	F SH	Shield gnd
E1		P12	U SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		J9	SH	Shield gnd
E1		J10	SH	Shield gnd
E1		J11	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TB2	SH	Shield gnd
E1		TJ13	SH	Shield gnd
E1		TJ14	SH	Shield gnd
E1		TJ15	SH	Shield gnd
E1		TJ16	SH	Shield gnd
E1		TJ17	SH	Shield gnd
E1		TJ18	SH	Shield gnd
E1		TJ19	SH	Shield gnd
E2		B2	R1	400 Hz
E3		B2	R2	PHArtn
J1	A	CB1	LINE	+28 Vprime
J1	B	CR1	CATH	28 V rtn
J1	C	NC		
J2	A	SPLICE	1	+28 V Target power
J2	B	SPLICE	1	+28 V Target power
J2	C	SPLICE	2	28 Vrtn
J2	D	SPLICE	2	28 Vrtn
J2	E	XA14	18	Rtn
Ja	F	NC		
J2	G	XA14	10	Center target
J2	H	XA14	6	Left target

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J2	J	XA14	7	Right target
J2	K	XA14	8	Up target
,J2	L	XA14	9	Down target
J2	M	NC		
J2	N	NC		
J2	P	NC		
J2	R	NC		
J2	S	XA1	14	Target amplitude
J2	T	XA1	20	Manual rtn
J2	U	S8A	7	Log H
J2	V	S8B	7	Log H rtn
J3	A	NC		
J3	B	NC		11.8 sin 0
J3	C	NC		σZ1
J3	D	NC		σZ2
J3	E	NC		Shields
J3	F	NC		Cos θ ref
J3	G	NC		Motion compensation SW
J3	H	NC		El track stick command
J3	J	NC		Az track stick command
J3	K	XA22	11	Manual
J3	L	XA22	10	Az manual control
J3	M	XA22	16	El manual control
J3	N	XA4	25	BIT comp no. 1
J3	P	XA4	23	BIT comp no. 2
J3	R	XA4	27	BIT comp no. 3
J3	S	XA4	31	BIT comp. no. 4
J3	T	XA1	25	El torque buffered
J3	U	XA1	28	Az torque buffered
J3	V	S12B	C2	El track stick command 100°/S
J3	W	S12B	C1	Az track stick command 100°/s

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J3	X	S7E	4	Derotation servo rate
J3	Y	S7C	4	Window servo rate
J3	Z	XA5	34	Az out
13	a	XA5	9	Az in
13	b	XA5	32	Az error
J3	c	XA5	31	El out
J3	d	XA5	8	El in
J3	e	XA5	30	El error
J3	f	TJ	1	p servo error
J3	g	TJ	2	ρ servo rate
J3	h	XA1	29	Clutch engage command
J3	i	TJ	3	SCA BIT pass
J3	j	NC		El acquisition command
J3	k	NC		AZ gimbal angle
J3	m	NC		28 V rtn
J3	n	TJ	4	Derotation servo error
J3	p	NC		
J3	q	XA17	15	El gimbal angle
J3	r	TJ	10	SCA rtn
J3	s	XA17	13	Az gimbal angle
J3	t	XA13	6	El motion compensation
J3	u	XA13	7	AZ motion compensation
J3	v	S9A	11	El torque current
J3	w	S9A	10	Az torque current
J3	x	XA8	2	Yaw error
J3	y	NC		Gyro alignment
J3	z	XA8	1	Pitch error
J3	AA	NC		
J3	BB	XA8	12	Yaw LOS rate
J3	c c	XA8	6	Pitch LOS rate

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J3	DD	XA8	10	Yaw OLC
J3	EE	XA8	8	Analog signal rtn
J3	FF	NC		Airspeed
J3	GG	XA4	8	Launch constraint
J3	HH	S9C	10	11.8 sin ϕ
J3	JJ	S9E	7	10 sin Z
J3	KK	S12A	1	Az track command 100 MR/S
J3	LL	S12A	7	El track command 100 MR/S
J3	MM	TJ	5	Window servo error
J3	NN	S5A	11	11.8 Cos P
J3	PP	S5A	5	11.8 sin P
J4	A	NC		
J4	B	NC		
J4	C	NC		
J4	D	S4A	10	10 cos G
J4	E	NC		Shield gnd
J4	F	XA9	2	Az ref
J4	G	S9E	2	El sample pulse
J4	H	S9C	2	Az sample pulse
J4	J	XA1	24	El VS1
J4	K	NC		
J4	L	S5A	10	10 Cos G
J4	M	S5A	4	10 sin G
J4	N	NC		-15V
J4	P	XA9		AZ bandpass
J4	R	TJ	9	TSU rtn
J4	S	XA9	6	El ref
J4	T	XA9	5	El band pass
J4	u	NC		-15 v

Table3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J4	V	XA4	33	Az VS1
J4	W	XA4	12	10 V, 400 Hz, ph (A +90)
J4	X	NC		
J4	Y	XA22	45	BIT 3
J4	Z	XA22	44	BIT 5
J4	a	XA22	43	BIT 6
J4	b	NC		Direction cos i_G
J4	c	NC		Direction cos i_G rtn
J4	d	NC		Direction cos j_G
J4	e	NC		Direction cos j_G rtn
J4	f	NC		Direction cos k_G
J4	g	NC		Direction cos k_G rtn
J4	h	NC		Gun line i_t
J4	i	NC		Gun line i_t rtn
J4	j	NC		Gun line j_t
J4	k	NC		Gun line j_t rtn
J4	m	NC		Gun line k_t
J4	n	NC		Gun line k_t rtn
J4	p	NC		Az gun command
J4	q	NC		Az gun command rtn
J4	r	NC		El gun command
J4	s	NC		El gun command rtn
J4	t	NC		Cos $_G$
J4	u	NC		Sin $_G$
J4	V	NC		Az acquisition command
J4	W	NC		El acquisition command
J4	X	NC		Az acquisition command rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J4	Y	NC		El acquisition Command rtn
J4	z	XA22	20	K1 (t) BIT pass
J4	AA	NC		
J4	BB	NC		
J4	CC	NC		
J4	DD	NC		
J4	EE	NC		Track mode
J4	FF	NC		Weapon select
J4	GG	S4A	4	10 sin η_G
J4	HH	NC		
J4	JJ	NC		
J4	KK	NC		
J4	LL	NC		
J4	MM	NC		-28 V
J4	NN	NC		Turret action
J4	PP	NC		Pilot acquisition
J5	A	NC		
J5	B	XA16	7	Program interrupt
J5	c	XA16	22	Timer start
J5	D	XA16	23	T6, t=0
J5	E	NC		Shield gnd
J5	F	XA16	20	T7, t= .17
J5	G	NC		
J5	H	TJ	12	Tll, t = .79
J5	J	XA16	12	T13, t = 1.35
J5	K	XA16	9	T14, t = 2,34
J5	L	XA16	11	T15, t = 4.32
J5	M	NC		
J5	N	XA22	47	BIT 1

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J5	P	XA22	4	In test
J5	R	XA22	46	BIT 2
J5	S	S24	2	Pitch VCO disable
J5	T	S32	2	Yaw VCO disable
J5	U	XA8	5	Pitch SBI
J5	V	XA8	3	Yaw SBI
J5	W	S9A	12	+28 v squib power
J5	X	XA16	2	T17, t = 13.48
J5	Y	TB2	5	115 V, 400 Hz, ph A
J5	z	TB2	4	115 V, 400 Hz, ph B
J5	a	TB2	2	115 V, 400 Hz, ph C
J5	b	TJ	11	Prefire/fire/wirecut
J5	c	NC		Programmer sequence
J5	d	XA22	28	BIT 4
J5	e	TJ	20	MCA rtn
J5	f	XA22	31	MCA BIT pass
J5	g	XA8	9	Pitch output
J5	h	XA8	11	Yaw output
J5	i	XA13	28	Pitch limit and sum
J5	j	S7C	8	Yaw limit and sum
J5	k	XA8	14	CVAC
J5	m	XA8	7	G bias sum amp
J5	n	XA22	42	BIT 7
J5	p	XA22	30	BIT 8
J5	q	XA22	32	BIT 9
J5	r	XA22	29	BIT 10
J6	A	NC		
J6	B	NC		
J6	C	NC		
J6	D	NC		Shield gnd
J6	E	TJ	21	Tow trigger armed
J6	F	NC		

Table 3-2. Control Monitor Wire List-Continued

From		To		Signal Name
J6	G	TJ	22	Stow bite enable
J6	H	TJ	23	Acquisition
J6	J	NC		Airspeed P327
J6	K	XA4	2	Airspeed rtn
J6	L	XA1	7	Wire signal A
J6	M	XA1	1	Wire signal B
J6	N	TJ	24	Wide-medium switch
J6	P	TJ	25	Medium-narrow switch
J6	R	XA7	2	Az stick command in
J6	S	XA7	13	Az stick rtn in
J6	T	XA6	2	El stick command in
J6	U	XA6	13	El stick rtn in
J6	V	NC		Roll synchro ph A
J6	W	NC		Roll synchro ph B
J6	X	NC		Roll synchro ph C
J6	Y	NC		Pitch synchro ph A
J6	Z	NC		Pitch synchro ph B
J6	a	NC		Pitch synchro ph C
J6	b	TJ	26	Missile present/selected
J6	c	TJ	27	Weapon select SCA
J6	d	TJ	28	Indicator test
J6	e	CB2	LOAD	Remote on command
J6	f	XA4	6	Airspeed
J6	g	NC		Airspeed rtn
J6	h	XA7	7	Az stick command out
J6	i	XA7	13	Az stick rtn
J6	j	XA6	7	El stick command out
J6	k	XA6	13	El stick rtn
J6	m	XA3	9	Roll synchro ph B
J6	n	XA3	6	Roll synchro ph C

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J6	p	XA2	4	Pitch synchro ph A (S3)
J6	q	XA2	9	Pitch synchro ph B (S2)
J6	r	XA2	6	Pitch synchro ph C (S1)
J6	s	NC		
J6	t	XA3	4	Roll synchro ph A (S3)
J7	A	NC		
J7	D	NC		
J7	c	NC		
J7	D	NC		
J7	E	NC		Chassis gnd
J7	F	XA15	33	20 V rms, 4 kHz
J7	G	NC		
J7	H	XA16	35	7 V rms, 900 Hz, ph A
J7	J	XA16	34	7 V rms, 900 Hz, ph B
J7	K	NC		40 V, 400 Hz//500 Hz
J7	L	S9A	4	-40 v
J7	M	S9A	3	-20 v
J7	N	TJ	7	EPS dc rtn
J7	P	S9A	a	.10 V
J7	R	S9A	1	.20 v
J7	S	S7A	12	-40 v
J7	T	NC		
J7	U	S7A	10	-28 V
J7	V	TJ	8	28 V rtn
J7	W	NC		Ovcrvoltage signal
J7	X	NC		Pre regulator out
J7	Y	NC		17 v bias
J7	Z	NC		-17 v bias
J7	a	NC		12 V bias
J7	b	NC		-12 V bias

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J7	c	NC		Undervoltage off signal
J8	HI	S8A	6	Test leads hi
J8	SHLD	S8B	6	Test leads lo
J9	HI	S8A	C1	Scope A
J9	SHLD	E1	1	MCU rtn
J1O	HI	S8B	C1	Scope B
J1O	SHLD	E1	1	MCU rtn
J11	HI	XA14	35	T_0/clutch engage
J11	SHLD	E1	1	MCU rtn
J13	A	XA18	24	Rtn
J13	B	XA18	13	Indicator Vee
J13	c	XA18	4	Lamp test out
J13	D	XA18	43	Tens (8)
J13	E	XA18	34	Tens (4)
J13	F	XA18	37	Tens (2)
J13	H	XA18	33	Thousands (8)
J13	J	XA18	38	Thousands (4)
J13	K	XA18	31	Thousands (2)
J13	L	XA18	32	Thousands (1)
J13	M	XA18	8	Thousands DP
J13	N	XA18	14	Thousands RBO/BI
J13	P	XA18	12	Thousands RBI
J13	R	XA18	42	Tens (1)
J13	s	XA18	6	Tens DP
J13	T	NC		Tens RBI/BI
J13	u	XA18	41	Hundreds (8)
J13	v	XA18	29	Hundreds (4)
J13	w	XA18	30	Hundreds (2)
J13	x	XA18	40	Hundreds (1)

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
J13	Y	XA18	9	Hundreds DP
J13	z	XA18	1	Hundreds RBO
J13	AA	XA18	45	Tens RBI
J13	BB	XA18	35	Units (8)
J13	CC	XA18	28	Units (4)
J13	DD	XA18	26	Units (2)
J13	EE	XA18	36	Units (1)
J13	FF	XA18	5	Units DP
J13	HH	NC		Units RBO/BI
J13	JJ	XA18	46	Hundreds RBI
J13	KK	NC		
J13	LL	NC		
J13	MM	NC		
J13	NN	NC		
J14	A	XA19	1	DVM rtn
J14	B	XA19	22	+5 V isolated sw
J14	c	XA19	6	DMM
J14	D	XA19	26	D3 (8)
J14	E	XA19	28	D3 (4)
J14	F	XA19	31	D3 (2)
J14	H	XA19	27	D3 (1)
J14	J	XA19	20	Sign (+)
J14	K	XA19	21	1)1
J14	L	XA19	15	Sign (-)
J14	M	XA17	41	Units DP
J14	N	XA19	14	+/- 1 Blanking
J14	P	XA19	10	Hundrcds DP
J14	R	XA19	7	Tens and hundreds BI
J14	s	XA19	18	D2 (8)
J14	T	XA19	16	D2 (4)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J14	u	XA19	19	D2 (2)
J14	v	XA19	17	D2 (1)
J14	w	J15	u	Tens DP
J14	x	XA19	8	Thousands BI
J14	Y	XA19	9	Thousands RBI
J14	z	XA19	37	D4 (8)
J14	AA	XA19	5	Units BI
J14	BB	XA19	29	D4 (4)
J14	CC	XA19	30	D4 (2)
J14	DD	XA19	38	D4 (1)
J14	EE	XA19	7	Tens and hundreds BI
J14	FF	XA19	43	D5 (8)
J14	HH	XA19	41	D5 (4)
J14	JJ	XA19	39	D5 (2)
J14	KK	XA19	42	D5 (1)
J14	LL	NC		
J14	MM	NC		
J14	NN	NC		
J15	A	XA19	40	+5 V isolated
J15	B	J18B	2	+5 V isolatcd sw
J15	c	XA17	40	S/N blanking
J15	D	J18A	3	-12 V isolated
J15	E	P12	K	DVM rtn
J15	F	J18A	14	DVM HI
J15	H	J18A	15	DVM LO
J15	J	XA19	1	DVM rtn
J15	K	S8A	C1	Input hi
J15	L	S8B	C1	Input low
J15	L	XA9	**10**	Input low
J15	M	XA9	8	O-2 V ac

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J15	N	XA9	33	Rms out
J15	P	XA9	18	Rtn
J15	R	XA9	34	S/N
J15	s	XA19	6	DP lamp test
J15	T	XA17	41	Units DP
J15	u	J14	w	Tens DP
J15	V	XA19	10	Hundreds DP
J15	w	J18B	1	DVM rtn
J15	x	J18B	7	DVM DP
J15	Y	XA19	34	DVM D4
J15	z	XA19	35	DVM D3
J15	AA	XA19	36	DVM D2
J15	BB	XA17	44	Ω /RMS blanking
J15	CC	XA19	22	+5 V isolated sw
J15	DD	XA19	4	Units blanking
J15	EE	NC		
J15	FF	NC		
J15	HH	NC		
J15	J J	XF1	A	Fuse A
J15	KK	NC		
J15	LL	NC		
J15	MM	NC		
J15	NN	XF1	B	Fuse B
J16	A	XA3	18	Rtn
J16	B	XA1	5	API-1 VCC
J16	c	XA1	2	Lamp test A
J16	D	XA3	22	Units (8)
J16	E	XA3	25	Units (4)
J16	F	XA3	20	Units (2)
J16	H	XA3	14	Units (1)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signa1 Name
J16	J	NC		Units RBO/RBI
J16	K	XA3	31	Az (+)
J16	L	XA3	32	Hundreds (1)
J16	M	XA3	34	AZ (-)
J16	N	NC		Hundreds RBO/RBI
J16	I	NC		
J16	R	NC		
J16	S	NC		
J16	T	NC		
J16	U	XA3	30	Tens (8)
J16	V	XA3	28	Tens (4)
J16	w	XA3	26	Tens (2)
J16	x	XA3	23	Tens (1)
J16	Y	NC		Tens RB0/RBI
J16	z	XA3	12	1/10's (8)
J16	AA	NC		
J16	BB	XA3	11	1/10's (4)
J16	CC	XA3	10	1/10's (2)
J16	DD	XA3	7	1/10's (1)
J16	EE	NC		1/10's RB0/RBI
J16	FF	NC		
J16	HH	NC		
J16	JJ	NC		
J16	KK	NC		
J16	LL	NC		
J16	MM	NC		
J16	NN	NC		
J17	A	XA2	18	Rtn
J17	B	XA1	4	API-2 Vee
J17	c	XA1	2	Lamp test B

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J17	D	XA2	22	Units (8)
J17	E	XA2	25	Units (4)
J17	F	XA2	20	Units (2)
J17	H	XA2	14	Units (1)
J17	J	NC		Units RBO/RBI
J17	K	XA2	31	El (+)
J17	L	XA2	32	Hundreds (1)
J17	M	XA2	34	El (-)
J17	N	NC		Hundreds RBO/RBI
J17	P	NC		
J17	R	NC		
J17	s	NC		
J17	T	NC		
J17	u	XA2	30	Tens (8)
J17	v	XA2	28	Tens (4)
J17	w	XA2	26	Tens (2)
J17	x	XA2	23	Tens (1)
J17	Y	NC		Tens RBO/RBI
J17	z	XA2	12	1/10's (8)
J17	AA	NC		
J17	BB	XA2	11	1/10's (4)
J17	CC	XA2	10	1/10's (2)
J17	DD	XA2	7	1/10's (1)
J17	EE	NC		1/10's RBO/RBI
J17	FF	NC		
J17	HH	NC		
J17	JJ	NC		
J17	KK	NC		
J17	LL	NC		
J17	MM	NC		

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J17	NN	NC		
J18A	1	NC		
J18A	2	NC		
J18A	3	J15	D	-12 V isolated
J18A	3	P12	J	-12 V isolated
J18A	4	NC		Sign blank
J18A	5	NC		Ext. conversion
J18A	6	NC		Display blank
J18A	7	XA19	13	DVM strobe
J18A	8	NC		Not +100
J18A	9	XA19	47	BCD(1)
J18A	10	XA19	46	BCD (2)
J18A	11	XA19	11	BCD (4)
J18A	12	XA19	12	BCD (8)
J18A	13	NC		
J18A	14	J15	F	DVM HI
J18A	15	J15	H	DVM LO
J18B	1	J15	w	DVM rtn
J18B	2	J15	B	+5 isolated sw
J18B	3	NC		NOT REF PHASE
J18B	4	XA19	45	DVM SIGN
J18B	5	XA17	43	Overflow
J18B	6	XA17	45	Under range
J18B	7	J15	x	DVM DP
J18B	8	XA19	33	DVM D5
J18B	9	XA19	34	DVM D4
J18B	10	XA19	35	DVM D3
J18B	11	XA19	36	DVM D2
J18B	12	XA19	32	DVM Dl
J18B	13	NC		
J18B	14	NC		Analog input

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
J18B	15	NC		Signal gnd
Ml	+	9031	E2	Az meter
Ml		M2		TSU rtn
Ml		XA4	35	TSU rtn
M2	-	9031	E4	El meter
M2		Ml		TSU rtn
M3	+	TB1	1	Running time meter
M3		TB1	3	**Rtn**
P12	A	TB2	5	115 V, 400 Hz, ph A
P12	B	TB2	3	115 V, 400 Hz, ph B
P12	c	XA17	4	26 V, 400 Hz, ph (A+90)
P12	**D**	TB2	**2**	115 V, 400 Hz, ph C
P12	**E**	XA17	24	26 V, 400 Hz, ph (A+90) rtn
P12	**F**	TB1	2	+28 V
P12	H	XA19	40	+5 V isolated
P12	J	J18A	3	-12 V isolated
P12	K	J15	E	DVM rtn
P12	L	TB1	4	28 V rtn
P12	M	XA7	16	+5 v
P12	N	XA7	17	+18 V
P12	P	XA18	15	Lamp +5 V
P12	R	XA6	4	+60 v
P12	s	S2C	1	+5 v
P12	T	NC		
P12	u	S1	4NC	26 V, 400 Hz, ph A
P12	v	XA7	18	+/- 60 V rtn
P12	w	XA3	18	**Rtn**
P12	x	NC		
P12	Y	XA20	43	-12 v
P12	Z	XA6	**3**	-60 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
P12	a	S2A	1	Panel rtn
P12	b	XA7	19	-18 V
P12	c	B1	R2	26 V, 400 Hz, ph A rtn
P12	d	NC		
P12	f	TJ	10	SCA rtn
P12	g	XA3	18	Rtn
P12	h	XA6	18	Rtn
P12	i	NC		
P12	j	NC		
P12	k	NC		
P12	m	E1	1	Shield gnd
R1	1	R2	1	+18 V
R1	1	XA7	17	+18 V
R1	2	XA7	9	Manual
R1	3	XA7	19	-18 V
R1	3	R2	3	-18 V
R2	1	R1	1	+18 V
R2	2	XA6	9	Manual
R2	3	RI	3	-18 V
R3	1	XA4	18	Rtn
R3	2	XA1	15	Manual adjust (O to +10 V)
R3	3	S29	3	+10 v
S1	1C	E1	1	Rtn
S1	1C	81	2C	Rtn
S1	1NO	TJ	9	TSU rtn
S1	1NC	NC		
S1	2C	81	1C	Rtn
S1	2C	S1	3C	Rtn
S1	2N0	S4C	4	SCA rtn
S1	2N0	TJ	10	8CA rtn
S1	2NC	NC		

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
S1	3C	S1	2C	Rtn
S1	3N0	S24	3	MCA rtn
S1	3NC	NC		
S1	4C	B1	R1	400 Hz
S1	4N0	XA4	11	10 V, 4OO HZ
S1	4NC	P12	u	26 V, 400 Hz, ph A
S2A	C1	XA15	12	units (1)
S2A	1	P12	a	Panel rtn
S2A	1	S3A	2	Rtn
S2A	1	S2A	2	Rtn
S2A	1	SPLICE	4	Rtn
S2A	2	S2A	1	Rtn
S2A	2	S2A	4	Rtn
S2A	3	S3A	1	+5 v
S2A	3	S2A	5	+5 v
S2A	3	S13	2	+5 v
S2A	4	S2B	1	Rtn
S2A	4	S2A	2	Rtn
S2A	5	S2A	3	+5 v
S2A	5	S2B	5	+5 v
S2B	Cl	XA15	21	units (2)
S2B	1	S2A	4	Rtn
S2B	1	S2B	2	Rtn
S2B	2	S2B	1	Rtn
S2B	2	S2B	3	Rtn
S2B	3	S2B	2	Rtn
S2B	3	S2C	3	Rtn
S2B	4	S2B	5	+5 v
S2B	5	S2A	5	+5 v
S2B	5	S2B	4	+5 v

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S2B	5	S2C	1	+5 v
S2C	C1	XAl8	18	Display on
S2C	1	P12	s	+5 v
S2C	1	S2B	5	+5 v
S2C	2	S2C	3	Rtn
S2C	3	S2C	2	Rtn
S2C	3	S2B	3	Rtn
S2C	3	S2C	4	Rtn
S2C	4	S2C	3	Rtn
S2C	4	S2C	5	Rtn
S2C	5	S2C	4	Rtn
S3A	C1	XA15	8	Freq/time (1)
S3A	1	S2A	3	+5 v
S3A	1	S4B	9	+5 v
S3A	1	S3A	3	+5 v
S3A	2	S2A	1	Rtn
S3A	2	S3A	4	Rtn
S3A	3	S3A	1	+5 v
S3A	3	S3A	5	+5 v
S3A	4	S3A	2	Rtn
S3A	4	S3A	6	Rtn
S3A	5	S3A	7	+5 v
S3A	5	S3A	3	+5 v
S3A	6	S3A	4	Rtn
S3A	6	S3A	8	Rtn
S3A	7	S3A	5	+5 v
S3A	7	S3A	9	+5 v
S3A	8	S3A	6	Rtn
S3A	8	S3A	10	Rtn
S3A	9	S3A	7	+5 v

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
S3A	9	S3A	11	+5 v
S3A	10	S3A	8	Rtn
S3A	10	S3A	12	Rtn
S3A	11	S3A	9	+5 v
S3A	11	S3B	11	+5 v
S3A	12	S3A	10	Rtn
S3A	12	S3B	12	Rtn
S3B	c l	XA15	10	Freq/time(2)
S3B	1	S3C	1	Rtn
S3B	1	S3B	4	Rtn
S3B	2	S2B	4	+5 v
S3B	2	S3B	3	+5 v
S3B	3	S3B	2	+5 v
S3B	3	S3B	6	+5 v
S3B	4	S3B	1	Rtn
S3B	4	S3B	5	Rtn
S3B	5	S3B	4	Rtn
S3B	5	S3B	8	Rtn
S3B	6	S3B	3	+5 v
S3B	6	S3C	6	+5 v
S3B	6	S3B	7	+5 v
S3B	7	S3B	6	+5 v
S3B	7	S3B	10	+5 v
S3B	8	S3B	5	Rtn
S3B	8	S3B	9	Rtn
S3B	9	S3B	8	Rtn
S3B	9	S3B	12	Rtn
S3B	10	S3B	7	+5 v
S3B	10	S3B	11	+5 v
S3B	11	S3A	11	+5 v

Table 3-2. Control Monitor Wire List- Continued

From		To		Signal Name
S3B	11	S3B	10	+5 v
S3B	12	S3A	12	Rtn
S3B	12	S3B	9	Rtn
S3C	c l	XA15	14	Freq/time (4)
S3C	1	S3C	2	Rtn
S3C	1	S3B	1	Rtn
S3C	1	S3D	1	Rtn
S3C	2	S3C	1	Rtn
S3C	2	S3C	3	Rtn
S3C	3	S3C	2	Rtn
S3C	3	S3C	8	Rtn
S3C	4	S3C	5	+5 v
S3C	5	S3C	4	+5 v
S3C	5	S3C	6	+5 v
S3C	6	S3C	5	+5 v
S3C	6	S3B	6	+5 v
S3C	6	S3C	7	**+5 v**
S3C	7	S3C	6	**+5 v**
S3C	7	S3D	8	+5 v
S3C	8	S3C	3	Rtn
S3C	8	S3C	9	Rtn
S3C	9	S3C	8	Rtn
S3C	9	S3C	10	Rtn
S3C	10	S3C	9	Rtn
S3C	10	S3C	11	Rtn
S3C	11	S3C	10	Rtn
S3C	11	S3C	12	Rtn
S3C	12	S3C	11	Rtn
S3D	c l	XA15	24	Freq/time (8)
S3D	1	S3C	1	Rtn
S3D	1	S3D	2	Rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S3D	2	S3D	1	Rtn
S3D	2	S3D	3	Rtn
S3D	3	S3D	2	Rtn
S3D	3	S3D	4	Rtn
S3D	4	S3D	3	Rtn
S3D	4	S3D	5	Rtn
S3D	5	S3D	6	Rtn
S3D	5	S3D	4	Rtn
S3D	6	S3D	5	Rtn
S3D	6	S3D	7	Rtn
S3D	7	S3D	6	Rtn
S3D	8	S3C	7	+5 v
S3D	8	S3D	9	+5 v
S3D	9	S3D	8	+5 v
S3D	9	S3D	10	+5 v
S3D	10	S3D	9	+5 v
S3D	10	S3D	11	+5 v
S3D	11	S3D	10	+5 v
S3D	11	S3D	12	+5 v
S3D	12	S3D	11	+5 v
S4A	c l	XA3	15	Resolver sin
S4A	C2	XA3	13	Resolver cos
S4A	1	NC		
S4A	2	XA3	33	Sin/cos 45°
S4A	2	S4A	8	Sin/cos 45°
S4A	3	XA3	3	Ro1l res sinα
S4A	4	J4	GG	10 sinη_G
S4A	7	NC		
S4A	8	S4A	2	Sin/cos 45°
S4A	9	XA3	8	Roll res cos α

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S4A	10	J4	D	10 cos ¹ G
S4B	C l	XA3	35	Add Hz ref hi
S4B	C2	XA1	5	API-1 Vee
S4B	1	NC		
S4B	2	S5B	2	10 V, 400 Hz
S4B	2	XA4	11	10 V, 400 Hz
S4B	3	B1	R1	400 Hz
S4B	3	S5B	3	400 Hz
S4B	4	S5B	4	10 V, 400 Hz, ph (A+90)
S4B	7	NC		
S4B	8	S4B	9	+5 V
S4B	9	S3A	1	+5 V
S4B	9	S4B	8	+5 V
S4B	9	S4B	10	+5 V
S4B	10	S5B	8	+5 V
S4B	10	S4B	9	+5 V
S4C	C0l	XA3	24	Converter rtn
S4C	1	NC		
S4C	2	XA4	18	Rtn
S4C	2	S5C	2	Rtn
S4C	3	XA3	18	Rtn
S4C	3	S5C	3	Rtn
S4C	4	S1	2N0	SCA rtn
S4C	4	S5C	4	SCA rtn
S5A	C l	XA2	15	Resolver sin
S5A	C2	XA2	13	Resolver cos
S5A	1	NC		
S5A	2	S5A	8	Sin/cos 45°
S5A	2	XA2	33	Sin/cos 45°

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S5A	3	XA2	3	Pit res sin o
S5A	4	J4	M	10 $\sin_G$
S5A	5	J3	PP	11.8 sin p
S5A	7	NC		
S5A	8	S5A	2	Sin/cos 45°
S5A	9	XA2	8	Pitch res cos α
S5A	10	J4	L	10 $\cos_G$
S5A	11	J3	NN	11.8 COS ρ
S5B	C1	XA2	35	Ref HI
S5B	C2	XAI	4	API-2 Vee
S5B	1	NC		
S5B	2	S4B	2	10 V, 400 Hz
S5B	3	S4B	3	400 Hz
S5B	3	S5B	5	400 Hz
S5B	4	S4B	4	10 V, 400 Hz, ph (A+90)
S5B	4	XA4	12	10 V, 400 Hz, ph (A+90)
S5B	5	S5B	3	400 Hz
S5B	7	NC		
S5B	8	S5B	9	+5 V
S5B	8	S4B	10	+5 V
S5B	9	S5B	8	+5 V
S5B	9	S5B	10	+5 V
S5B	10	S5B	9	+5 V
S5B	10	S5B	11	+5 V
S5B	11	S5B	10	+5 V
S5C	c l	XA2	24	converter rtn
S5C	1	NC		
S5C	2	S4C		Rtn
S5C	3	S4C		Rtn

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
S5C	4	S4C	4	SCA rtn
S5C	4	S5C	5	SCA rtn
S5C	5	S5C	4	SCA rtn
S6C	C1	XA16	1	Timer interrupt
S6A	C1	S9A	9	Timer interrupt
S6A	1	NC		
S6A	2	XA16	23	T6,t = 0
S6A	3	XA16	20	T7, t = .17
S6A	4	XA16	13	Tll, t = .79
S6A	5	XA16	12	T13, t = l.35
S6A	6	XA16	9	T14, t = 2.34
S6A	7	XA16	11	T15, t = 4.32
S6A	8	XA16	2	T17, t = 13.48
S7A	C1	S8A	2	S7 Output A
S7A	1	XA6	4	+60 V
S7A	2	XA16	17	+18 V
S7A	3	XA10	23	+10 V
S7A	3	Sl0	2	+10 V
S7A	4	XA16	16	+5 V
S7A	5	XA16	19	-18 V
S7A	6	XA6	3	-60 V
S7A	7	XA1	27	-10 V
S7A	7	S17	3	-l0 V
S7A	8	TB2	5	115 V, 400 Hz, ph AB
S7A	9	TB2	2	l15 V, 400 Hz, ph CB
S7A	10	J7	u	+28 V
S7A	11	CB2	LOAD	Remote on cmd
S7A	12	J7	s	+40 V
S7B	C1	S8B	2	S7 Output B
S7B	1	S7B	2	Rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S7B	2	S7B	1	Rtn
S7B	2	S7B	3	Rtn
S7B	3	S7B	2	Rtn
S7B	3	S7B	4	Rtn
S7B	3	S7D	3	Rtn
S7B	4	S7B	3	Rtn
S7B	4	S7B	5	Rtn
S7B	5	S7B	4	Rtn
S7B	5	S7B	6	Rtn
S7B	6	S7B	5	Rtn
S7B	6	S7B	7	Rtn
S7B	7	S7B	6	Rtn
S7B	8	S7B	9	115 V, 400 Hz, ph B (GND)
S7B	9	S7B	8	115 V, 400 Hz, ph B (GND)
S7B	9	TB2	3	115 V, 400 Hz, ph B (GND)
S7B	10	T J	8	28 V rtn
S7B	10	S7B	11	28 V rtn
S7B	11	S7B	10	28 V rtn
S7B	12	T J	7	EPS rtn
S7B	12	S9B	1	EPS rtn
S7C	c l	S8A	3	S7 output c
S7C	1	XA15	27	Az band pass
S7C	2	XA4	33	Az VS1
S7C	3	XA4	32	AZ VS1 filtered
S7C	4	J3	Y	Window servo rat e
S7C	5	XA8	12	Yaw LOS rate
S7C	6	XA13	7	Az motion compensation
S7C	7	XA8	2	Yaw error
S7C	8	J5	j	Yaw limit and sum
S7C	9	XA8	11	Yaw output

Table 3-2. Control Monitor Wire List-Continued

From		To		Signal Name
S7C	10	XA1	28	Az torque buffered
S7C	11	XA7	1	Az gimbal angle filtered
S7C	12	XA8	3	Yaw SBI
S7D	C1	S8B	3	S7 Output D
S7D	1	XA4	35	TSU rtn
S7D	1	S7D	2	TSU rtn
S7D	1	S9D	1	TSU rtn
S7D	2	S7D	1	TSU rtn
S7D	2	S7F	1	TSU rtn
S7D	3	XA4	18	Rtn
S7D	3	S7B	3	Rtn
S7D	3	S7F	3	Rtn
S7D	4	XA1	32	SCA rtn
S7D	4	S7D	6	SCA rtn
S7D	4	S9B	10	SCA rtn
S7D	5	S9B	8	Analog signal rtn
S7D	5	S7D	7	Analog signal rtn
S7D	6	S7D	4	SCA rtn
S7D	6	S7D	10	SCA rtn
S7D	7	S7D	5	Analog signal rtn
S7D	7	XA8	8	Analog signal rtn
S7D	7	S7F	5	Analog signal rtn
S7D	8	S7D	12	MCA rtn
S7D	8	S7D	9	MCA rtn
S7D	9	S7D	8	MCA rtn
S7D	9	XA8	4	MCA rtn
S7D	9	S7F	8	MCA rtn
S7D	10	S7D	6	SCA rtn
S7D	10	S7D	11	SCA rtn
S7D	11	S7D	10	SCA rtn
S7D	11	S7F	11	SCA rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S7D	12	S7D	8	MCA rtn
S7D	12	S7F	12	MCA rtn
S7E	C1	S8A	4	S7 0utput E
S7E	1	XA9	5	El band pass
S7E	2	XA4	14	El VS1
S7E	3	XA4	26	EI VSl filtered
S7E	4	J3	x	Denotation servo rate
S7E	5	XA8	6	Pitch LOS rate
S7E	6	XA13	6	El motion compensation
S7E	7	XA8	1	Pitch error
S7E	8	XA13	28	Pitch limit and sum
S7E	9	XA8	9	Pitch output
S7E	10	XA1	25	El torque buffered
S7E	11	XA6	1	El gimbal angle filtered
S7E	12	XA8	5	Pitch SBI
S7F	C1	S8B	4	
S7F	1	S7D	2	TSU rtn
S7F	1	S7F	2	TSU rtn
S7F	2	S7F	1	TSU rtn
S7F	3	S7D	3	Rtn
S7F	4	S7F	6	SCA rtn
S7F	5	S7D	7	Analog signal rtn
S7F	5	S7F	7	Analog signal rtn
S7F	6	S7F	4	SCA rtn
S7F	6	S7F	10	SCA rtn
S7F	7	S7F	5	Analog signal rtn
S7F	8	S7D	9	MCA rtn
S7F	8	S7F	9	MCA rtn
S7F	9	S7F	8	MCA rtn
S7F	10	S7F	6	SCA rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S7F	10	S7F	11	SCA rtn
S7F	11	S7F	10	SCA rtn
S7F	11	S7D	11	SCA rtn
S7F	11	S9F	12	SCA rtn
S7F	12	S7D	12	MCA rtn
S8A	C1	J9	HI	Scope A
S8A	C1	J15	K	Input hi
S8A	1	NC		
S8A	2	S7A	C l	S7 Output A
S8A	3	S7C	C l	S7 output C
S8A	4	S7E	C l	S7 Output E
S8A	5	TB1	1	+28 V
S8A	6	J8	HI	Test lead hi
S8A	7	J2	U	Log H
S8A	8	S9E	C l	S9 Output E
S8A	9	S9C	C l	S9 output C
S8A	10	S9A	C l	S9 Output A
S8A	11	XA5	11	+1.500 V ref
S8A	12	XA5	33	1.5 V square wave
S8B	C1	J10	HI	Scope B
S8B	C1	J15	L	Input low
S8B	1	NC		
S8B	2	S7B	c l	S7 Output B
S8B	3	S7D	c l	S7 Output D
S8B	4	S7F	c l	S7 Output F
S8B	5	DS23	1	28 V rtn
S8B	5	TB1	3	28 V rtn
S8B	6	J8	SHLD	Test lead 10
S8B	7	J2	v	Log H rtn
S8B	8	S9F	c l	
S8B	9	S9D	c l	

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S8B	10	S9B	C1	
S8B	11	S8B	12	Ref low
S8B	11	XA5	12	Ref low
S8B	12	S8B	11	Ref low
S9A	Cl	S8A	10	
S9A	1	J7	R	+20 V
S9A	2	J7	P	+10 V
S9A	3	J7	M	-20 V
S9A	4	J7	L	-40 V
S9A	5	XA15	33	20 V rms, 4 kHz
S9A	6	XA16	35	7 V, 900 Hz, ph A
S9A	7	XA16	34	7 V, 900 Hz, ph B
S9A	8	S10	3	Timer start
S9A	9	S6A	Cl	Timer interrupt
S9A	10	J3	W	Az torque current
S9A	11	J3	V	El torque current
S9A	12	J5	W	+28 V squib power
S9B	Cl	S8B	10	S9 Output B
S9B	1	S7B	12	EPS rtn
S9B	1	S9B	2	EPS rtn
S9B	2	S9B	1	EPS rtn
S9B	2	S9B	3	EPS rtn
S9B	3	S9B	2	EPS rtn
S9B	3	S9B	4	EPS rtn
S9B	4	S9B	3	EPS rtn
S9B	4	S9B	5	EPS rtn
S9B	5	S9B	4	EPS rtn
S9B	5	S9B	6	EPS rtn
S9B	6	S9B	5	EPS rtn
S9B	6	S9B	7	EPS rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S9B	7	S9B	6	EPS rtn
S9B	8	S7D	5	Analog signal rtn
S9B	8	S9B	9	Analog signal rtn
S9B	9	S9B	8	Analog signal rtn
S9B	9	S9B	12	Analog signal rtn
S9B	10	S7D	4	SCA rtn
S9B	10	S9B	11	SCA rtn
S9B	11	S9B	10	SCA rtn
S9B	11	S9D	10	SCA rtn
S9B	12	S9B	9	Analog signal rtn
S9C	C1	S8A	9	S9 Output C
S9C	1	XA9	z	Az ref
S9C	2	J4	H	Az sample pulse
S9C	3	XA7	7	Az stick command out
S9C	4	XA5	9	Az in
S9C	5	XA5	34	Az out
S9C	6	XA5	32	Az error
S9C	7	XA4	8	Launch constraint
S9C	8	XA8	10	Yaw OLC
S9C	9	XA4	6	Airspeed
S9C	10	J3	HH	11.8 sinϕ
S9C	11	XA1	13	Wire signal C
S9C	12	XA5	10	Servo analyzer DC
S9D	c l	S8B	9	S9 Output D
S9D	1	S7D	1	TSU rtn
S9D	1	S9D	2	TSU rtn
S9D	2	S9D	1	TSU rtn
S9D	2	S9F	1	TSU rtn
S9D	3	XA7	13	Az stick rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S9D	4	S9D	5	SCA rtn
S9D	5	S9D	4	SCA rtn
S9D	5	S9D	6	SCA rtn
S9D	6	S9D	5	SCA rtn
S9D	6	S9D	7	SCA rtn
S9D	7	S9D	6	SCA rtn
S9D	7	S9D	8	SCA rtn
S9D	8	S9D	7	SCA rtn
S9D	8	S9D	10	SCA rtn
S9D	9	XA4	2	Airspeed rtn
S9D	10	S9D	8	SCA rtn
S9D	10	S9B	11	SCA rtn
S9D	10	S9F	10	SCA rtn
S9D	11	XA4	18	Rtn
S9D	11	S9D	12	Rtn
S9D	12	S9D	11	Rtn
S9E	c l	S8A	8	S9 Output E
S9E	1	XA9	6	El ref
S9E	2	J4	G	El sample pulse
S9E	3	XA6	7	El stick command out
S9E	4	XA5	8	El in
S9E	5	XA5	31	El out
S9E	6	XA6	30	El error
S9E	7	J3	J J	10 sin σ Z
S9E	8	XA4	25	BIT comp. no. 1
S9E	9	XA4	23	BIT comp. no. 2
S9E	10	XA4	27	BIT comp. no. 3
S9E	11	XA4	31	BIT comp. no. 4
S9E	12	XA22	33	SCA BIT pass
S9F	C1	S8B	8	S9 Output F
S9F	1	S9D	2	TSU rtn

Table 3-2, Control Monitor Wire List - Continued

From		To		Signal Name
S9F	1	S9F	2	TSU rtn
S9F	2	S9F	1	TSU rtn
S9F	3	XA6	13	El stick rtn
S9F	4	S9F	5	SCA rtn
S9F	5	S9F	4	SCA rtn
S9F	5	S9F	6	SCA rtn
S9F	6	S9F	5	SCA rtn
S9F	6	S9F	7	SCA rtn
S9F	7	S9F	6	SCA rtn
S9F	7	S9F	8	SCA rtn
S9F	8	S9F	7	SCA rtn
S9F	8	S9F	9	SCA rtn
S9F	9	S9F	8	SCA rtn
S9F	9	S9F	10	SCA rtn
S9F	10	S9F	9	SCA rtn
S9F	10	S9D	10	SCA rtn
S9F	10	S9F	11	SCA rtn
S9F	11	S9F	10	SCA rtn
S9F	12	S7F	11	SCA rtn
Sl0	1	NC		
Sl0	2	S7A	3	+10 V
Sl0	2	S17	1	+10 V
Sl0	2	S29	3	+10 V
Sl0	3	XA16	22	Timer start
Sl0	3	S9A	8	Timer start
S12A	C1	XA7	11	Az gimbal command
S12A	C2	XA6	11	El gimbal command
S12A	1	J3	KK	Az track command 100 MR/S
S12A	1	S12A	3	Az track command 100 MR/S

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S12A	2	NC		
S12A	3	S12A	1	Az track command 100 MR/S
S12A	7	J3	LL	El track command 100 MR/S
S12A	7	S12A	9	El track command 100 MR/S
S12A	8	NC		
S12A	9	S12A	7	El track command 100 MR/S
S12B	C1	J3	W	Az track stick command 100°/S
S12B	C2	J3	V	El track stick command 100°/S
S12B	1	NC		
S12B	2	NC		
S12B	3	XA7	1	Az gimbal angle filtered
S12B	7	NC		
S12B	8	NC		
S12B	9	XA6	1	El gimbal angle filtered
S13	1	XA21	34	Auto hi
S13	2	S22	3	+5 V
S13	2	S2A	3	+5 V
S13	2	S14	3	+5 V
S13	3	XA21	33	Auto low
S14	1	S14	3	+5 V
S14	1	SPLICE	3	+5 V
S14	2	XA21	35	Reset hi
S14	3	S13	2	+5 V
S14	3	S14	1	+5 V
S14	4	XA21	36	Reset low
S15A	c	SPLICE	3	+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S15A	C'	SPLICE	4	Rtn
S15A	1	XA20	2	Tens (1)
S15A	2	XA20	3	Tens (2)
S15A	4	XA20	4	Tens (4)
S15A	8	XA20	5	Tens (8)
S15B	C	SPLICE	3	+5 V
S15B	C'	SPLICE	4	Rtn
S15B	1	XA20	18	Units (1)
S15B	2	XA20	19	Units (2)
S15B	4	XA20	20	Units (4)
S15B	8	XA20	1	Units (8)
S17	1	S17	4	+10 V
S17	1	Sl0	2	+10 V
S17	2	XA22	12	Az manual control
S17	3	S7A	7	-l0 V
S17	3	S18	1	-l0 V
S17	4	S17	1	+10 V
S17	4	S17	6	+10 V
S17	5	S18	5	Manual
S17	5	XA22	11	Manual
S17	6	S17	4	+10 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S17	6	S18	6	+10 V
S18	1	S17	3	-1O V
S18	2	XA22	14	El manual
S18	3	S18	6	+10 V
S18	4	S18	6	+10 V
S18	5	S17	5	Manual
S18	6	S17	6	+10 V
S18	6	S18	4	+10 V
S18	6	S18	3	+10 V
S19	Cl	SPLICE	3	+5 V
S19	1	NC		
S19	2	XA14	20	Manual center
S19	3	XA14	2	Manual left
S19	4	XA14	3	Manual right
S19	5	XA14	4	Manual up
S19	6	XA14	5	Manual down
S21	Cl	S29	2	In test
S21	1	NC		
S21	2	XA22	45	BIT 3
S21	3	XA22	28	BIT 4
S21	4	XA22	44	BIT 5
S21	5	XA22	43	BIT 6

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S21	6	XA22	42	BIT 7
S21	7	XA22	30	BIT 8
S21	8	XA22	32	BIT 9
S21	9	XA22	29	BIT 10
S22	1	SPLICE	4	Rtn
S22	1	S23	1	Rtn
S22	2	XA8	32	CVAC manual
S22	3	S23	3	+5 V
S22	3	S13	2	+5 V
S23	1	S22	1	Rtn
S23	1	S25	1	Rtn
S23	2	XA8	31	G bias manual
S23	3	S22	3	+5 V
S23	3	S25	3	+5 V
S24	1	NC		
S24	2	J5	s	Pitch VCO disable
S24	3	S32	3	MCA rtn
S24	3	S1	3N0	MCA rtn
S25	1	S23	1	Rtn
S25	1	S26	1	Rtn
S25	2	XA8	34	Pitch SB1 manual
S25	3	S23	3	+5 V
S25	3	S26	3	+5 V
S26	1	S25	1	Rtn
S26	1	S27	1	Rtn
S26	2	XA8	29	Pitch LOS manual
S26	3	S25	3	+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S26	3	S27	3	+5 V
S27	1	XA8	18	Rtn
S27	1	S26	1	Rtn
S27	1	S28	1	Rtn
S27	1	S35	1	Rtn
S27	2	XA8	33	Pitch error manual
S27	3	S26	3	+5 V
S27	3	S28	3	+5 V
S27	3	S35	3	+5 V
S28	1	S27	1	Rtn
S28	2	XAl0	31	Lamp test
S28	2	S28	4	Lamp test
S28	3	S27	3	+5 V
S28	4	S28	2	Lamp test
S29	1	NC		
S29	2	XA22	4	In test
S29	2	S21	C1	In test
S29	3	Sl0	2	+1O V
S29	3	R3	3	+1O V
S30	1	S31	1	Rtn
S30	2	XAl	12	Manual cluth engage
S30	3	S31	3	+5 V
S31	1	S30	1	Rtn
S31	1	S33	1	Rtn
S31	2	XA8	30	Yaw OLC manual disable
S31	3	S30	3	+5 V
S31	3	S33	3	+5 V
S32	1	NC		
S32	2	J5	T	Yaw VCO disable
S32	3	S24	3	MCA rtn
S32	3	TJ	20	MCA rtn
S33	1	S31	1	Rtn
S33	1	S34	1	Rtn
S33	2	XA8	27	Yaw SBI manual
S33	3	S31	3	+5 v

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
S33	3	S34	3	+5 V
S34	1	S33	1	Rtn
S34	1	S35	1	Rtn
S34	2	XA8	35	Yaw LOS manual
S34	3	S33	3	+5 V
S34	3	S35	3	+5 V
S35	1	S34	1	Rtn
S35	1	S27	1	Rtn
S35	2	XA8	28	Yaw error manual
S35	3	S34	3	+5 V
S35	3	S27	3	+5 V
SPLICE	1	J2	A	+28 V Target power
SPLICE	1	J2	B	+28 V Target power
SPLICE	1	CB3	LOAD	Power on
SPLICE	2	J2	C	28 V rtn
SPLICE	2	J2	D	28 V rtn
SPLICE	2	TB1	3	28 V rtn
SPLICE	3	S14	1	+5 V
SPLICE	3	S15A	C	+5 V
SPLICE	3	S15B	C	+5 V
SPLICE	3	S19	C1	+5 V
SPLICE	4	S2A	1	Rtn
SPLICE	4	S15A	C’	Rtn
SPLICE	4	S15B	C’	Rtn
SPLICE	4	S22	1	Rtn
TB1	1	M3	+	Running timer meter
TB1	1	S8A	5	+28 V
TB1	1	TB1	2	+28 V
TB1	2	DSl	02/G	+28 V
TB1	2	CB2	LINE	+28 V
TB1	2	P12	F	+28 V
TB1	2	TB1	1	+28 V
TB1	3	CR1	ANOD	28 V rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
TB1	3	MS	-	Running timer meter
TB1	3	Splice	2	28 V rtn
TB1	3	S8B	5	28 V rtn
TB1	3	TB1	4	28 V rtn
TB1	4	P12	L	28 V rtn
TB1	4	TB1	3	28 V rtn
TB1	4	XAl0	27	28 V rtn
TB1	4	E l	1	28 V rtn
TB1	5	NC		Spare
TB1	6	NC		Spare
TB2	6	NC		Spare
TB2	1	NC		
TB2	2	C l	A	115 V, 400 Hz, Ph CB
TB2	2	87A	9	115 V, 400 Hz, ph CB
TB2	2	J5	a	115 V, 400 Hz, ph CB
TB2	2	P12	D	115 V, 400 Hz, ph CB
TB2	3	P12	B	115 V, 400 Hz, ph B (GND)
TB2	3	TB2	4	115 V, 400 Hz, ph B (GND)
TB2	3	S7B	9	115 V, 400 Hz, ph B (GND)
TB2	3	C l	B	115 V, 400 Hz, ph B (GND)
TB2	4	C2	B	115 V, 400 Hz, ph B (GND)
TB2	4	J5	z	115 V, 400 Hz, ph B (GND)
TB2	4	TB2	3	115 V, 400 Hz, ph B (GND)
TB2	5	J5	Y	115 V, 400 Hz, ph A
TB2	5	S7A	8	115 V, 400 Hz, ph A
TB2	5	P12	A	115 V, 400 Hz, ph A
TB2	5	C2	A	115 V, 400 Hz, ph A
TJ	1	J3	f	P servo error
TJ	2	J3	g	P servo rate
TJ	3	J3	i	SCA BIT pass
TJ	3	XA22	33	SCA BIT pass
TJ	4	J3	n	Denotation servo error
TJ	5	J3	MM	Window servo error
TJ	6	NC		

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
TJ	7	J7	N	EPS rtn
TJ	7	S7B	12	EPS rtn
TJ	8	S7B	10	28 V rtn
TJ	8	J7	v	28 V rtn
TJ	9	J4	R	TSU rtn
TJ	9	S1	1 NO	TSU rtn
TJ	9	XA1	30	TSU rtn
TJ	10	J3	r	SCA rtn
TJ	10	P12	f	SCA rtn
TJ	10	S1	2 NO	SCA rtn
TJ	10	XAl	32	SCA rtn
TJ	11	J5	b	Prefire/fire/wirecut
TJ	12	J5	H	Tll, t =.79
TJ	12	XA16	13	Tll, t =.79
TJ	13	XA17	6	400 Hz
TJ	14	XA3	4	Roll synchro ph A (S3)
TJ	15	XA3	9	Roll synchro ph B (S2)
TJ	16	XA3	6	Roll synchro ph C (S1)
TJ	17	XA2	4	Pitch synchro ph A (S3)
TJ	18	XA2	9	Pitch synchro ph B (S2)
TJ	19	X42	6	Pitch synchro ph C (S1)
TJ	20	S32	3	MCA rtn
TJ	20	J5	e	MCA rtn
TJ	20	XA16	8	MCA rtn
TJ	20	XA8	4	MCA rtn
TJ	20	XA13	32	MCA rtn
TJ	21	J6	E	TOW trigger armed
TJ	22	J6	G	Stow bite enable
TJ	23	J6	H	Acquisition
TJ	24	J6	N	Wide-medium switch

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
TJ	25	J6	P	Medium-narrow switch
TJ	26	J6	b	Msl present/selected
TJ	27	J6	c	Weapon select SCA
TJ	28	J6	d	Indicator teat
TJ	29	NC		
TJ	30	E		MCU rtn
XAl	1	J6	AM	Wire signal B
XA1	2	J17	c	Lamp test B
XAl	2	J16	c	Lamp test A
XAl	3	XA21	10	Select step response
XAl	4	J17	B	API-2 Vcc
XAl	4	S5B	C2	API-2 Vcc
XAl	5	J16	B	API- 1 Vcc
XAl	5	S4B	C2	API- 1 Vcc
XA1	6	XAl0	31	Lamp test
XAl	7	J6	L	Wire signal A
XA1	8	XA9	35	Select S/N
XA1	9	XA6	31	Select motion compensation
XA1	10	XA14	29	Select log H
XA1	11	XA2	1	Auto
XA1	12	S30	2	Manual clutch engage
XA1	13	XA15	34	Wire signal C
XAl	13	S9C	11	Wire signal C
XAl	14	J2	s	Target amplitude
XA1	15	R3	2	Manual adjust (O to+ 10 V)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA1	16	XA2	16	+5 V
XA1	16	XA18	22	+5 V
XA1	17	XA2	17	+18 V
XA1	17	XA19	23	+18 V
XA1	18	XA2	16	Rtn
XA1	18	XA19	24	Rtn
XA1	19	XA2	19	-18 V
XAl	19	XA19	25	-18 V
XA1	20	J2	T	Manual rtn
XA1	21	XA20	16	Select El VS1 short
XA1	22	XA20	17	Select Az VS1 short
XA1	23	XA21	17	Select ΔP
XA1	24	XA4	14	El VS1
XA1	24	J4	J	El VS1
XA1	25	J3	T	El torque buffered
XA1	25	S7E	10	El torque buffered
XAl	25	XA10	4	El torque buffered
XA1	26	XA4	1	+1.500 V ref
XA1	27	S7A	7	-l0 V
XAl	28	J3	u	Az torque buffered
XAl	28	S7C	10	Az torque buffered
XA1	28	XAl0	6	Az torque buffered
XAl	29	J3	h	Clutch engage command
XAl	29	XA14	11	Clutch engage command
XA1	30	XA4	35	TSU rtn
XA1	30	TJ	9	TSU rtn
XAl	31	XA21	41	Select -5 V
XAl	32	S7D	4	SCA rtn
XAl	32	TJ	10	SCA rtn
XAl	32	XA4	13	SCA rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XAl	33	XA4	33	Az VS1
XA1	34	XA10	23	+10 V
XA1	35	XA14	22	Alternate target
XA2	1	XA1	11	Auto
XA2	1	XA3	1	Auto
XA2	2	XA21	16	Select El API strobe
XA2	3	S5A	3	Pitch resolver sin o
XA2	4	B2	S3	Pitch synchro ph A (S3)
XA2	4	TJ	17	Pitch synchro ph A (S3)
XA2	4	J6	p	Pitch synchro ph A (S3)
XA2	5	XA4	21	El strobe
XA2	6	B2	S1	Pitch Synchro ph c (S1)
XA2	6	TJ	19	Pitch synchro ph C (S1)
XA2	6	J6	r	Pitch synchro ph C (S1)
XA2	7	J17	DD	1/10's (1)
XA2	8	S5A	9	Pitch resolver cos o
XA2	9	B2	S2	Pitch synchro ph B (S2)
XA2	9	TJ	18	Pitch synchro ph B (S2)
XA2	9	J6	q	Pitch synchro ph B (S2)
XA2	10	J17	c c	1/10's (2)
XA2	11	J17	BB	1/10's (4)
XA2	12	J17	z	1/''10's (8)
XA2	13	S5A	C2	Resolver cos
XA2	14	J17	H	Units (1)
XA2	15	S5A	Cl	Resolver sin
XA2	16	XA1	16	+5 V
XA2	16	XA3	16	+5 V
XA2	17	XA1	17	+18 V
XA2	17	XA3	17	+18 V
XA2	18	J17	A	Rtn
XA2	18	XA2	4	Shield
XA2	18	XA2	6	Shield

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA2	18	XA1	18	Rtn
XA2	18	XA2	9	Shield
XA2	18	XA3	18	Rtn
XA2	19	XAl	19	-18V
XA2	19	XA3	19	-18 V
XA2	20	J17	F	Units (2)
XA2	21	NC		
XA2	22	J17	D	Units (8)
XA2	23	J17	x	Tens (1)
XA2	24	S5C	Cl	Converter rtn
XA2	25	J17	E	Units (4)
XA2	26	J17	W	Tens (2)
XA2	27	XA17	30	El 25 limit
XA2	28	J17	V	Tens (4)
XA2	29	NC		
XA2	30	J17	U	Tens (8)
XA2	31	J17	K	El (+)
XA2	31	XA17	29	El (+)
XA2	32	J17	L	Hundreds (1)
XA2	33	S5A	2	Sin, cos 45’
XA2	34	J17	M	El (-)
XA2	34	XA17	28	El (-)
XA2	35	S5B	Cl	Ref hi
XA3	1	XA2	1	Auto
XA3	1	XA6	30	Auto
XA3	2	XA21	21	Select Az API strobe
XA3	3	S4A	3	Pitch resolver sin o
XA3	4	B1	S3	Roll synchro ph A (S3)
XA3	4	TJ	14	Roll synchro ph A (S3)
XA3	4	J6	t	Roll synchro ph A (S3)
XA3	5	XA4	22	Az strobe

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA3	6	B1	S1	Roll synchro ph C (S1)
XA3	6	TJ	16	Roll synchro ph C (S1)
XA3	6	J6	n	Roll synchro ph C (S1)
XA3	7	J16	DD	1. l0's (1)
XA3	8	S4A	9	Roll resolver cos o
XA3	9	B1	S2	Roll synchro ph B (S2)
XA3	9	TJ	15	Roll synchro ph B (S2)
XA3	9	J6	m	Roll synchro ph B (S2)
XA3	10	J16	CC	1, l0's (2)
XA3	11	J16	BB	1 10's (4)
XA3	12	J16	Z	1 10's (8)
XA3	13	S4A	C2	Resolver cos
XA3	14	J16	H	Units (1)
XA3	15	S4A	C1	Resolver sin
XA3	16	XA2	16	+5 V
XA3	16	XA4	16	+5 V
XA3	17	XA2	17	+18 V
XA3	17	XA4	17	+18 V
XA3	18	XA3	4	Shield
XA3	18	P12	g	Rtn
XA3	18	XA3	6	Shield
XA3	18	J16	A	Rtn
XA3	18	XA3	9	Shield
XA3	18	P12	W	Rtn
XA3	18	XA2	18	Rtn
XA3	18	B1	R2	Rtn
XA3	18	XA4	18	Rtn
XA3	18	S4C	3	Rtn
XA3	19	XA2	19	-18 V
XA3	19	XA4	19	-18 V
XA3	20	J16	F	Units (2)
XA3	21	NC		
XA3	22	J16	D	Units (8)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA3	23	J16	x	Tens (1)
XA3	24	S4C	Cl	Converter rtn
XA3	25	J16	E	Units (4)
XA3	26	J16	w	Tens (2)
XA3	27	XA17	36	Az 25 limit
XA3	28	J16	v	Tens (4)
XA3	29	XA17	35	Az 45° limit
XA3	30	J16	u	Tens (8)
XA3	31	J16	K	Az (+)
XA3	31	XA17	33	Az (+)
XA3	32	J16	L	Hundreds (1)
XA3	33	S4A	2	Sin/cos 45
XA3	34	J16	M	Az (-)
XA3	34	XA17	32	Az (-)
XA3	35	S4B	c l	Add Hz ref hi
XA4	1	XA1	26	+1.500 V ref
XA4	1	XA5	21	+1.500 V ref
XA4	2	S9D	9	Airspeed rtn
XA4	2	J6	K	Airspeed rtn
XA4	3	XA6	5	El ready
XA4	4	XA7	5	Az ready
XA4	5	XAl0	32	Ready lamp control
XA4	6	S9C	9	Airspeed
XA4	6	J6	f	Airspeed
XA4	7	XA20	41	Select servo test
XA4	8	S9C	7	Launch constraint
XA4	8	J3	GG	Launch constraint
XA4	9	XAl0	33	Valid lamp control
XA4	10	XA21	9	Select V_h >35k

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA4	11	S4B	2	10 V, 400 Hz
XA4	11	S1	4N0	10 V, 400 Hz
XA4	12	J4	W	10 V, 400 HZ, ph (A + 90°)
XA4	12	S5B	4	10 V, 400 Hz, ph (A + 90)
XA4	13	XAl0	1	SCA rtn
XA4	13	XAl	32	SCA rtn
XA4	13	XA17	3	SCA rtn
XA4	14	S7E	2	El VSl
XA4	14	9031	E3	El VSl
XA4	14	XAl	24	El VS1
XA4	15	XA21	18	Select 0.8 V BIT test
XA4	16	XA3	16	+5 V
XA4	16	XA5	16	+5 V
XA4	17	XA3	17	+18 V
XA4	17	XA5	17	+18 V
XA4	18	S9D	11	Rtn
XA4	18	R3	1	Rtn
XA4	18	S7B	7	Rtn
XA4	18	S7D	3	Rtn
XA4	18	S4C	2	Rtn
XA4	18	XA3	18	Rtn
XA4	18	XA5	18	Rtn
XA4	18	El		Rtn
XA4	19	XA3	19	-18 V
XA4	19	XA5	19	-18 V
XA4	20	NC		
XA4	21	XA2	5	El strobe
XA4	22	XA3	5	Az strobe
XA4	23	S9E	9	BIT comp no. 2
XA4	23	J3	P	BIT comp no. 2
XA4	24	NC		

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA4	25	S9E	8	BIT comp no. 1
XA4	25	J3	N	BIT comp no. 1
XA4	26	S7E	3	El VS1 filtered
XA4	26	XA13	5	El VS1 filtered
XA4	27	S9E	10	BIT comp no. 3
XA4	27	J3	R	BIT comp. no. 3
XA4	28	XA21	1	Comp data (1)
XA4	29	XA21	2	Comp data (2)
XA4	30	XA21	3	Comp data (4)
XA4	31	S9E	11	BIT comp no. 4
XA4	31	J3	s	BIT comp no. 4
XA4	32	S7C	3	Az VSl filtered
XA4	32	XA13	4	Az VS1 filtered
XA4	33	J4	v	Az VS1
XA4	33	S7C	2	Az VSl
XA4	33	9031	E1	Az VS1
XA4	33	XAl	33	Az VSl
XA4	34	NC		
XA4	35	Ml		TSU rtn
XA4	35	S7D	1	TSU rtn
XA4	35	XAl	30	TSU rtn
XA5	1	XA15	35	35 Hz
XA5	2	XA21	19	Select el servo analyzer
XA5	3	NC		
XA5	4	XA21	20	Select az servo analyzer
XA5	5	NC		
XA5	6	NC		
XA5	7	NC		
XA5	8	J3		El in
XA5	8	S9E		El in

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA5	9	J3	*a*	*AZ* in
XA5	9	S9C	4	AZ in
XA5	10	XA13	13	Servo analyzer dc
XA5	10	S9C	12	Servo analyzer dc
XA5	11	S8A	11	+1. 500 V *ref* hi
XA5	11	XA13	23	+1. 500 V ref hi
XA5	12	S8B	11	Ref low
XA5	13	NC		
XA5	14	NC		
XA5	15	NC		
XA5	16	XA4	16	+5V
XA5	16	XA6	16	+5 V
XA5	17	XA4	17	+18 V
XA5	17	XA6	17	+18 V
XA5	18	XA4	18	Rtn
XA5	18	XA6	18	Rtn
XA5	19	XA4	19	-18 V
XA5	19	XA6	19	-18 V
XA5	20	NC		
XA5	21	XA4	1	+1.500 V ref
XA5	22	NC		
XA5	23	NC		
XA5	24	NC		
XA5	25	NC		
XA5	26	NC		
XA5	27	NC		
XA5	28	NC		
XA5	29	XA7	26	Select Az
XA5	30	J3	e	El error

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA5	30	S9E	6	El error
XA5	31	J3	c	El out
XA5	31	S9E	5	El out
XA5	32	J3	b	AZ error
XA5	32	S9C	6	Az error
XA5	33	S8A	12	1.500 V square wave
XA5	34	J3	z	Az out
XA5	34	S9C	5	Az out
XA5	35	NC		
XA6	1	XA17	1	El gimbal angle fi ltered
XA6	1	S12B	9	El gimbal angle filtered
XA6	1	S7E	11	El gimbal angle filtered
XA6	2	J6	T	El stick command in
XA6	3	P12	z	-60 V
XA6	3	S7A	6	-60 V
XA6	3	XA7	3	-60 V
XA6	4	P12	R	+60 V
XA6	4	S7A	1	+60 V
XA6	4	XA7	4	+6OV
XA6	5	XA4	3	El ready
XA6	6	XA15	23	El count gate
XA6	6	XA17	12	El count gate
XA6	7	S9E	3	El stick command out
XA6	7	J6	j	El stick command out
XA6	8	XA7	8	DC HI
XA6	9	R2	2	Manual
XA6	10	XA7	10	DC LO
XA6	11	S12A	C2	El gimbal command
XA6	12	XAl0	5	El torque buffered A
XA6	13	J6	k	El stick rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA6	13	J6	u	El stick rtn in
XA6	13	S9F	3	El stick rtn
XA6	14	NC		
XA6	15	NC		
XA6	16	XA5	16	+5 V
XA6	16	XA7	16	+5 V
XA6	17	XA5	17	+18 V
XA6	17	XA7	17	+18 V
XA6	18	P12	h	Rtn
XA6	18	XA5	18	Rtn
XA6	18	XA7	18	Rtn
XA6	19	XA5	19	-18 V
XA6	19	XA7	19	-18 V
XA6	20	XA7	20	Servo (4)
XA6	20	XA21	44	Servo (4)
XA6	21	NC		
XA6	22	NC		
XA6	23	NC		
XA6	24	NC		
XA6	25	NC		
XA6	26	XA7	28	Not az
XA6	27	NC		Spare
X46	28	NC		
XA6	29	NC		
XA6	30	XA3	1	Auto
XA6	30	XA7	30	Auto
XA6	31	XAl	9	Select motion compensation
XA6	31	XA7	31	Select motion compensation
XA6	32	XA7	32	Servo (2)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA6	32	XA21	43	Servo (2)
XA6	33	XA7	23	+5 V clutch
XA6	34	XA7	34	Servo (1)
XA6	34	XA21	42	Servo (1)
XA6	35	XA7	35	Servo (-)
XA6	35	XA21	45	Servo (-)
XA7	1	XA17	16	Az gimbal angle filtered
XA7	1	S7C	11	Az gimbal angle filtered
XA7	1	S12B	3	Az gimbal angle filtered
XA7	2	J6	R	Az stick command in
XA7	3	XA6	3	-60 V
XA7	4	XA6	4	+60 V
XA7	5	XA4	4	Az ready
XA7	6	XA15	11	Az count gate
XA7	6	XA17	26	Az count gate
XA7	7	J6	h	Az stick command out
XA7	7	S9C	3	Az stick command out
XA7	8	XA6	8	DC HI
XA7	8	XAll	11	Upper limit
XA7	9	R1	2	Manual
XA7	10	XAl1	7	Lower limit
XA7	10	XA6	10	DC LO
XA7	11	S12A	c l	Az gimbal command
XA7	12	XAl0	7	Az torque buffered A
XA7	13	J6	i	Az stick rtn
XA7	13	J6	S	Az stick rtn in
XA7	13	S9D	3	Az stick rtn
XA7	14	NC		
XA7	15	NC		
XA7	16	XA6	16	+5 V
XA7	16	P12	M	+5 V

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA7	16	XA8	16	+5 V
XA7	17	XA6	17	+18 V
XA7	17	P12	N	+18 V
XA7	17	R1	1	+18 V
XA7	17	XA8	17	+18 V
XA7	18	XA6	18	Rtn
XA7	18	XA8	18	Rtn
XA7	18	P12	v	Rtn
XA7	19	XA6	19	-18 V
XA7	19	P12	b	-18 V
XA7	19	R1	3	-18 V
XA7	19	XA8	19	-18 V
XA7	20	XA6	20	Servo(4)
XA7	21	NC		
XA7	22	NC		
XA7	23	NC		
XA7	24	NC		
XA7	25	NC		
XA7	26	XA8	20	Select az
XA7	26	XA5	29	Select az
XA7	27	NC		spare
XA7	28	XA6	26	Not az
XA7	29	NC		
XA7	30	XA6	30	Auto
XA7	30	XA8	21	Auto
XA7	31	XA6	31	Select motion compensation
XA7	31	XA12	33	Select motion compensation
XA7	32	XA6	32	Servo(2)
XA7	33	XA6	33	+5 V clutch
XA7	33	XA14	33	+5 V clutch

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA7	34	XA6	34	Servo (1)
XA7	35	XA6	35	Servo (-)
XA8	1	J3	z	Pitch error
XA8	1	S7E	7	Pitch error
XA8	2	J3	x	Yaw error
XA8	2	S7C	7	Yaw error
XA8	3	J5	V	Yaw SBI
XA8	3	S7C	12	Yaw SBI
XA8	4	TJ	20	MCA rtn
XA8	4	S7D	9	MCA rtn
XA8	5	J5	U	Pitch SBI
XA8	5	S7E	12	Pitch SBI
XA8	6	J3	CC	Pitch LOS rate
XA8	6	S7E	5	Pitch LOS rate
XA8	7	J5	m	G-bias sum amp
XA8	7	XA13	26	G-bias sum amp
XA8	8	S7D	7	Analog signal rtn
XA8	8	J3	EE	Analog signal rtn
XA8	9	S7E	9	Pitch output
XA8	9	J5	g	Pitch output
XA8	10	J3	DD	Yaw OLC
XA8	10	S9C	8	Yaw OLC
XA8	11	J5	h	Yaw output
XA8	11	S7C	9	Yaw output
XA8	12	J3	BB	Yaw LOS rate
XA8	12	S7C	5	Yaw LOS rate
XA8	13	XA13	11	Pitch/yaw V2
XA8	14	J5	k	CVAC
XA8	14	XA13	10	CVAC
XA8	15	NC		
XA8	16	XA7	16	+5 V
XA8	16	XA9	16	+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA8	17	XA7	17	+18 V
XA8	17	XA9	17	+18 V
XA8	18	XA7	18	Rtn
XA8	18	S27	1	Rtn
XA8	18	XA9	18	Rtn
XA8	19	XA7	19	-18 V
XA8	19	XA9	19	-18 V
XA8	20	XA7	26	Select az
XA8	20	XA9	3	Select az
XA8	21	XA7	30	Auto
XA8	21	XA14	32	Auto
XA8	22	NC		
XA8	23	XA20	7	MCA (1)
XA8	24	XA20	11	MCA (4)
XA8	25	XA20	6	MCA (2)
XA8	25	XA13	27	MCA (2)
XA8	26	XA13	9	Select CVAC
XA8	27	S33	2	Yaw SBI manual
XA8	28	S35	2	Yaw error manual
XA8	29	S26	2	Pitch LOS manual
XA8	30	S31	2	Yaw OLC manual
XA8	31	S23	2	G-bias manual
XA8	32	S22	2	CVAC manual
XA8	33	S27	2	Pitch error manual
XA8	34	S25	2	Pitch SBI manual
XA8	35	S34	2	Yaw LOS manual
XA9	1	J4	P	Az bandpass
XA9	1	XA15	27	Az bandpass
XA9	2	J4	F	Az ref
XA9	2	S9C	1	Az ref

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA9	3	XA8	20	Select Az
XA9	3	XA13	3	Select Az
XA9	4	NC		
XA9	5	J4	T	El bandpass
XA9	5	S7E	1	El bandpass
XA9	6	J4	S	El ref
XA9	6	S9E	1	El ref
XA9	7	NC		
XA9	8	J15	M	0-2 Vac
XA9	9	NC		
XA9	10	J15	L	Input low
XA9	11	NC		
XA9	12	NC		
XA9	13	NC		
XA9	14	NC		
XA9	15	NC		
XA9	16	XA8	16	+5 V
XA9	16	XAl0	16	+5 V
XA9	17	XA8	17	+18 V
XA9	17	XA10	17	+18 V
XA9	18	J15	P	Rtn
XA9	18	XA8	18	Rtn
XA9	18	XAl0	18	Rtn
XA9	19	XA8	19	-18 V
XA9	19	XAl0	19	-18 V
XA9	20	NC		
XA9	21	NC		
XA9	22	NC		
XA9	23	NC		
XA9	24	NC		
XA9	25	NC		

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA9	26	NC		
XA9	27	NC		
XA9	28	NC		
XA9	29	NC		
XA9	30	NC		
XA9	31	NC		
XA9	32	NC		
XA9	33	J15	N	Rms out
XA9	34	J15	R	S/N
XA9	35	XA21	6	Select S/N
XA9	35	XAl	8	Select S/N
XAl0	1	XA4	13	SCA rtn
XAl0	1	XA13	30	SCA rtn
XAl0	2	NC		
XAl0	3	NC		
XAl0	4	XAl	25	El torque buffered
XAl0	5	XA6	12	El torque buffered A
XAl0	6	XAl	28	Az torque buffered
XA10	7	XA7	12	Az torque buffered A
XAl0	8	XAll	26	Time code
XAl0	9	XA21	7	Select self test
XAl0	9	XA14	30	Select self test
XA10	10	XA14	35	To/clutch engage
XA10	11	XA14	26	End of test pulse
XA1O	12	XAl1	30	Motion compensation pulse
XAl0	13	XAll	23	Switch pulse
XAl0	14	NC		
XAl0	15	XAll	29	Window comparator 10/20
XA10	16	XA9	16	+5 V
XAl0	16	XAll	16	+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XAl0	17	XA9	17	+18 V
XA1O	17	XAll	17	+18 V
XAl0	18	XA9	18	Rtn
XAl0	18	XAll	18	Rtn
XAl0	19	XA9	19	-18 V
XAl0	19	XAll	19	-18 V
XAl0	20	D821	03/A	Pass lamp
XA1O	21	DS21	01/C	Fail lamp
XAl0	22	DS20	0l/C	In test lamp
XA1O	23	S7A	3	+10 V
XA1O	23	XAl	34	+10 V
XA1O	23	XA16	10	+10 V
XAl0	24	XA21	30	Not auto
XA10	25	DS22	03/A	3 phase lamp
XAl0	26	DS20	03/A	Ready lamp
XAl0	27	TB1	4	28 V rtn
XA1O	27	XA16	30	28 V rtn
XAl0	28	DSl	01/A	Valid lamp
XAl0	29	NC		
XAl0	30	XAl1	10	Comparator output
XAl0	31	S28	2	Lamp test
XAl0	31	XA16	14	Lamp test
XAl0	31	XAl	6	Lamp test
XAl0	32	XA4	5	Ready lamp control
XAl0	33	XA4	9	Valid lamp control
XAl0	34	NC		
XAl0	35	XA17	2	3 ph sequence
XAll	1	XA13	33	C VAC square wave
XAll	2	XA13	34	Capacitor discharge
XAll	3	XA21	10	Select step response

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XAll	4	XA14	22	Alternate target
XA1l	5	NC		
XA1l	6	XA13	1	Analog signal
XAll	7	XA7	10	Lower limit
XAll	7	XA12	27	Lower limit
XAll	8	XA14	21	100 Hz window comparator
XAll	9	XA12	32	System reset
XA1l	10	XAl0	30	Comparator output
XA11	11	XA7	8	Upper limit
XA1l	11	XA12	14	Upper limit
XA1l	12	NC		
XAll	13	XA20	39	Select C VAC
XA1l	14	XA16	5	Gate width select
XA1l	15	XA12	28	+15 sw
XA1l	16	XA1O	16	+5 V
XA1l	16	XA12	16	+5V
XA1l	17	XAl0	17	+18 V
XAl1	17	XA12	17	+18 V
XAll	18	XAl0	18	Rtn
XA1l	18	XA12	18	Rtn
XAll	19	XAl0	19	-18 V
XA1l	19	XA12	19	-18 V
XAll	20	XA12	6	-12 V sw B
XA11	21	XA12	24	-15 V sw
XAll	22	NC		
XA1l	23	XAl0	13	Switch pulse
XA1l	24	NC		
XA1l	25	NC		
XAll	26	XAl0		Time code
XAll	27	NC		

Table 3-2. Control Monitor Wire List-Continued

From		To		Signal Name
XAll	28	XA12	30	Next test
XA1l	29	XAl0	15	Window comparator 10/20
XAll	30	XAl0	12	Motion compensation pulse
XA1l	31	XA20	14	Time (4)
XA1l	32	XA20	13	Time (2)
XAll	33	XA20	12	Time (1)
XA11	34	XA12	8	ROM sw +5 V
XAll	35	XA13	2	Track-hold control
XA12	1	XA20	34	Limit (16)
XA12	2	XA20	33	Limit (8)
XA12	3	XA20	32	Limit (4)
XA12	4	XA20	31	Limit (2)
XA12	5	XA20	30	Limit (1)
XA12	6	XA20	4 5	-12 V sw B
XA12	6	XA11	20	-12 V sw B
XA12	7	NC		
XA12	8	XA20	47	ROM sw +5 V
XA12	8	XAl1	34	ROM sw +5 V
XA12	9	NC		
XA12	10	NC		
XA12	11	NC		
XA12	12	NC		
XA12	13	NC		
XA12	14	XAl1	11	Upper limit
XA12	15	NC		
XA12	16	XAll	16	+5 V
XA12	16	XA13	16	+5 V
XA12	17	XAl1	17	+18 V
XA12	17	XA13	17	+18 v
XA12	18	XAll	18	Rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA12	18	XA13	18	Rtn
XA12	19	XAll	19	-18 V
XA12	19	XA13	19	-18 V
XA12	20	NC		
XA12	21	NC		
XA12	22	NC		
XA12	23	NC		
XA12	24	XA20	26	-15 V sw
XA12	24	XAll	21	-15 V sw
XA12	25	NC		
XA12	26	NC		
XA12	27	XA1l	7	Lower limit
XA12	28	XA20	21	+15 V sw
XA12	28	XA1l	15	+15 V sw
XA12	29	NC		
XA12	30	XAll	28	Next test
XA12	31	XA21	40	Select servo
XA12	32	XAl1	9	System reset
XA12	32	XA15	3	System reset
XA12	33	XA7	31	Select motion compensation
XA12	33	XA14	24	Select motion compensation
xA12	34	NC		
XA12	35	NC		
XA12	1	XAl1	6	Analog signal
XA12	2	XAl1	35	Track hold control
XA12	3	XA9	3	Select Az
XA12	3	XA21	4	Select Az
XA12	4	XA4	32	Az VS1 filtered
XA12	5	XA4	26	El VSl filtered
XA12	6	J3	t	El motion compensation
XA12	6	S7E	6	El motion compensation

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA13	7	J3	u	Az motion compensation
X.A13	7	S7C	6	Az motion compensation
XA13	8	XA21	12	Select Kl(t) polarity
XA13	9	XA8	26	Select C VAC
XA13	10	XA8	14	C VAC
XA13	11	XA8	13	Pitch/yaw V2
XA13	12	XA20	15	Signal select (1)
XA13	13	XA5	10	Servo analyzer dc
XA13	14	XA20	8	Signal select (4)
XA13	15	XA20	9	Signal select (2)
XA13	16	XA12	16	+5 V
XA13	16	XA14	16	+5 V
XA13	17	XA12	17	+18 V
XA13	17	XA14	17	+18 V
XA13	18	XA12	18	Rtn
XA13	18	XA14	18	Rtn
XA13	19	XA12	19	-18 V
XA13	19	XA14	19	-18 V
XA13	20	NC		
XA13	21	NC		
XA13	22	NC		
XA13	23	XA5	11	+1.500 V ref.
XA13	24	NC		
XA13	25	NC		
XA13	26	XA8	7	G bias sum amp
XA13	27	XA8	25	Select pitch limit and sum
XA13	28	J5	i	Pitch limit and sum
XA13	28	S7E	8	Pitch limit and sum
XA13	29	NC		
XA13	30	XAl0	1	SCA rtn

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA13	31	NC		
XA13	32	TJ	20	MCA rtn
XA13	33	XAl1	1	C VAC square wave
XA13	34	XA11	2	Capacitor discharge
XA13	35	NC		
XA14	1	XA20	38	Target off
XA14	2	S19	3	Manual left
XA14	3	S15	4	Manual right
XA14	4	S19	5	Manual up
XA14	5	S19	6	Manual down
XA14	6	J2	H	Left target
XA14	7	J2	J	Right target
XA14	8	J2	K	Up target
XA14	9	J2	L	Down target
XA14	10	J2	G	Center target
XA14	11	XAl	29	Clutch engage command
XA14	12	XA20	36	Target (2)
XA14	13	XAl0	37	Target (1)
XA14	14	XA20	35	Target (4)
XA14	15	NC		
XA14	16	XA13	16	+5 V
XA14	16	XA15	16	+5 V
XA14	17	XA13	17	+18 V
XA14	17	XA15	17	+18 V
XA14	18	J2	E	Rtn
XA14	18	XA13	18	Rtn
XA14	18	XA15	18	Rtn
XA14	19	XA13	19	-18 V
XA14	19	XA15	19	-18 V
XA14	20	S19	2	Manual center

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA14	21	XA11	8	100 Hz window comparator
XA14	22	XAl	35	Alternate target
XA14	22	XAll	4	Alternate target
XA14	23	XA15	9	1 sec gate
XA14	24	XA20	40	Select motion compensation
XA14	24	XA12	33	Select motion compensation
XA14	25	XA15	13	Timer interval
XA14	26	XAl0	11	End of test pulse
XA14	27	XA15	30	1 kHz counter
XA14	28	NC		
XA14	29	XAl	10	Select log H
XA14	29	XA21	11	Select log H
XA14	30	XAl0	9	Select self test
XA14	31	XA15	4	Accumulator reset
XA14	32	XA8	21	Auto
XA14	32	XA21	31	Auto
XA14	33	XA7	23	5 V clutch
XA14	34	XA15	31	100 Hz counter
XA14	35	J11	HI	T_o/clutch engage
XA14	35	XA1O	10	T_o/clutch engage
XA15	1	XA18	2	Count gate
XA15	2	XA15	3	System reset
XA15	3	XA15	2	System reset
XA15	3	XA12	32	System reset
XA15	3	XA21	32	System reset
XA15	4	XA14	31	Accumulator reset
XA15	4	XA18	47	Accumulator reset
XA15	5	XA18	3	Data strobe
XA15	6	XA18	7	Manual reset
XA15	7	XA18	20	Count pulses

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA15	8	S3A	Cl	Freq/time (1)
XA15	9	XA14	23	1 sec gate
XA15	10	S3B	Cl	Freq/time (2)
XAl5	11	XA7	6	Az count gate
XA15	12	S2A	Cl	Units (1)
XA15	12	XA18	11	Units (1)
XA15	13	XA14	25	Timer interval
XA15	13	XM6	4	Timer interval
XA15	14	S3C	Cl	Freq/time (4)
XA15	15	NC		
XA15	16	XA14	16	+5 V
XA15	16	XA16	16	+5 V
XA15	17	XA14	17	+18 V
XA15	17	XA16	17	+18 V
XA15	18	XA14	18	Rtn
XA15	18	XA16	18	Rtn
XA15	18	XA15	4	Shield
XA15	18	XA15	5	Shield
XA15	10	XA15	7	Shield
XA15	18	XA15	33	Shkld
XA15	19	XA14	19	-18V
XA15	19	XA16	19	-18V
XA15	20	XA16	6	Timer start interval
XA15	21	S2B	C1	Units (2)
XA15	21	XA18	10	Units (2)
XA15	22	NC		
XA15	23	XA6	6	El count gate
XA15	24	S3D	Cl	Freq time (8)
XA15	25	XA17	6	400 Hz
XA15	26	XA16	35	20 V, 900 Hz, ph A
XA15	27	S7C	1	AZ bandpass
XA15	27	XA9	1	Az bandpass
XA15	28	NC		
XA15	29	NC		
XA16	16	XA15	16	+5 V
XA16	16	XA22	22	+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA15	30	XA14	27	1 kHz counter
XA15	31	XA14	34	100 Hz counter
XA15	32	NC		
XA15	33	J7	F	20 V rms, 4 k Hz
XA15	33	S9A	5	20 V rms, 4 k Hz
XA15	34	XAl	13	Wire signal C
XA15	35	XA5	1	35 Hz
XA16	1	S6A	Cl	Timer interrupt
XA16	2	S6A	8	T17, t = 13.48 s
XA16	2	J5	x	T17, t = 13.48 s
XA16	3	NC		
XA16	4	XA15	13	Timer interval
XA16	5	XA1l	14	Gate width select
XA16	6	XA15	20	Timer start interval
XA16	7	J5	B	Program interrupt
XA16	8	TJ	20	MCA rtn
XA16	9	J5	K	T14, t = 2.34 s
XA16	9	S6A	6	T14, t = 2.34 s
XA16	10	XAl0	23	+10 V
XA16	10	XA22	13	+1OV
XA16	11	J5	L	T15, t = 4.32 s
XA16	11	S6A	7	T15, t =4.32 s
XA16	12	J5	J	T13, t = 1.35 s
XA16	12	S6A	5	T13, t =1.35 s
XA16	13	TJ	12	Tll, t = 0.79 s
XA16	13	S6A	4	Tll, t =0.79 s
XA16	14	XA1O	31	Lamp test
XA16	14	XA18	16	Lamp test
XA16	15	NC		
XA16	16	S7A		+5 V

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA16	17	S7A	2	+18 V
XA16	17	XA15	17	+18 V
XA16	17	XA22	23	+1 8V
XA16	18	XA16	34	Shield
XA16	18	XA15	18	Rtn
XA16	18	XA16	35	Shield
XA16	18	XA22	24	Rtn
XA16	19	S7A	5	-18 V
XA16	19	XA15	19	-18 V
XA16	19	XA22	25	-18 V
XA16	20	J5	F	T7, t = 0.17 s
XA16	20	S6A	3	T7, t = 0.17 s
XA16	21	NC		
XA16	22	J5	C	Timer start
XA16	22	S10	3	Timer start
XA16	23	J5	D	T6, t= 0 s
XA16	23	S6A	2	T6, t= 0 s
XA16	24	DS3	1	Tll lamp
XA16	25	DS6	1	T7 lamp
XA16	26	DS2	1	T6 lamp
XA16	27	DS7	1	T13 lamp
XA16	28	DS4	1	T14 lamp
XA16	29	DS5	1	T17 lamp
XA16	30	XAl0	27	28 V rtn
XA16	30	XA22	6	28 V rtn
XA16	31	NC		
XA16	32	DS22	1/C	2 ph lamp
XA16	33	DS8	1	T15 lamp
XA16	34	J7	J	7 V, 900 Hz, ph B
XA16	34	S9A	7	7 V, 900 Hz, ph B

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA16	35	J7	H	7 V, 900 Hz, ph A
XA16	35	XA15	26	7 V, 900 Hz, phA
XA16	35	S9A	6	7 V, 900 Hz, ph A
XA17	1	XA6	1	El gimbal angle filtered
XA17	2	XAl0	35	3 ph sequence
XA17	3	XA4	13	SCA rtn
XA17	4	P12	C	26 V, 400 Hz, ph (A+90°)
XA17	5	NC		
XA17	6	B1	R1	400 Hz
XA17	6	TJ	13	400 Hz
XA17	6	XA15	25	400 Hz
XA17	7	NC		
XA17	8	NC		
XA17	9	NC		
XA17	10	NC		
XA17	11	NC		
XA17	12	XA6	6	El count gate
XA17	13	J3	s	Az gimbal angle
XA17	14	NC		
XA17	15	J3	q	El gimbal angle
XA17	16	XA7		Az gimbal angle filtered
XA17	17	NC		
XA17	18	NC		
XA17	19	NC		
XA17	20	NC		
XA17	21	NC		
XA17	22	XA18	22	+5 V
XA17	23	XA18	23	+18 V
XA17	24	P12	E	Rtn
XA17	24	XA18	24	Rtn
XA17	24	XA17	6	Shield

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA17	25	XA18	25	-18 V
XA17	26	XA7	6	AZ count gate
XA17	27	XA17	31	Limit (1)
XA17	28	XA2	34	El (-)
XA17	29	XA2	31	El (+)
XA17	30	XA2	27	El 25° limit
XA17	31	XA20	30	Limit (1)
XA17	31	XA17	27	Limit (1)
XA17	32	XA3	34	Az (-)
XA17	33	XA3	31	Az (+)
XA17	34	XA21	32	System reset
XA17	35	XA3	29	Az 45° limit
XA17	36	XA3	27	Az 25° limit
XA17	37	XA21	27	Select 25°
XA17	38	XA19	44	± blank
XA17	39	XA19	6	DMM lamp test
XA17	40	J15	C	S/N blanking
XA17	41	J14	M	Units DP
XA17	41	J15	T	Units DP
XA17	42	XA19	1	DVM rtn
XA17	43	J18B	5	Overflow
XA17	44	J15	BB	Ω/ rms blanking
XA17	45	J18B	6	Underrange
XA17	46	XA19	22	+5 V isolated sw
XA17	47	XA19	3	Overflow/underrange
XA18	1	J13	Z	Hundreds RBO
XA18	2	XA15	1	Count gate
XA18	3	XA15	5	Data strobe
XA18	4	J13	C	Lam p test out
XA18	5	J13	FF	Units DP

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA18	6	J13	S	Tens DP
XA18	7	XA15	6	Manual reset
XA18	8	J13	M	Thousands DP
XA18	9	J13	Y	Hundreds DP
XA18	10	XA15	21	Units (2)
XA18	11	XA15	12	Units (1)
XA18	12	J13	P	Thousands RBI
XA18	13	J13	B	Indicator Vcc
XA18	14	J13	N	Thousands RBO/BI
XA18	15	P12	P	Lamp +5 V
XA18	16	XA16	14	Lamp test
XA18	16	XA19	2	Lam p test
XA18	17	NC		
XA18	18	S2C	C1	Display on
XA18	19	NC		
XA18	20	XA15	7	Count pulses
XA18	21	NC		
XA18	22	XAl	16	+5 V
XA18	22	XA17	22	+5 V
XA18	23	XA17	23	+18 V
XA18	23	XA19	23	+18 V
XA18	24	J13	A	Rtn
XA18	24	XA19	24	Rtn
XA18	24	XA17	24	Rtn
XA18	25	XA19	25	-18 V
XA18	25	XA17	25	-18 V
XA18	26	J13	DD	Units (2)
XA18	27	NC		
XA18	28	J13	CC	Units (4)
XA18	29	J13	V	Hundreds (4)

Table 8-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA18	30	J13	W	Hundreds (2)
XA18	31	J13	K	Thousands (2)
XA18	32	J13	L	Thousands (1)
XA18	33	J13	H	Thousands (8)
XA18	34	J13	E	Tens (4)
XA18	35	J13	BB	Units (8)
XA18	36	J13	EE	Units (1)
XA18	37	J13	F	Tens (2)
XA18	38	J13	J	Thousands (4)
XA18	39	NC		
XA18	40	J13	X	Hundreds (1)
XA18	41	J13	U	Hundreds (8)
XA18	42	J13	R	Tens (1)
XA18	43	J13	D	Tens (8)
XA18	44	NC		
XA18	45	J13	AA	Tens RBI
XA18	46	J13	JJ	Hundreds RBI
XA18	47	XA15	4	Accumulator reset
XA19	1	J15	J	DVM return
XA19	1	J14	A	DVM rtn
XA19	1	XA17	42	DVM rtn
XA19	2	XA18	16	Lamp test
XA19	2	XA22	37	Lamp test
XA19	3	XA17	47	Overflow/underrange
XA19	4	J15	DD	Units blanking
XA19	5	J14	AA	Units BI
XA19	6	XA17	39	DMM Lamp test
XA19	6	J14	C	DMM Lamp test
XA19	6	J15	S	DMM Lamp test
XA19	7	J14	R	Tens and hundreds BI

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA19	7	J14	EE	Tens and hundreds BI
XA19	8	J14	X	Thousands BI
XA19	9	J14	Y	Thousands RBI
XA19	10	J15	V	Hundreds DP
XA19	10	J14	P	Hundreds DP
XA19	11	J18A	11	BCD (4)
XA19	12	J18A	12	BCD (8)
XA19	13	J18A	7	DVM strobe
XA19	14	J14	N	±1 blanking
XA19	15	J14	L	Sign (-)
XA19	16	J14	T	D2 (4)
XA19	17	J14	V	D2 (1)
XA19	18	J14	S	D2 (8)
XA19	19	J14	U	D2 (2)
XA19	20	J14	J	Sign (+)
XA19	21	J14	K	D1
XA19	22	J15	CC	+5 V isolated sw
XA19	22	XA17	46	+5 V isolated sw
XA19	22	J14	B	+5 V isolated sw
XA19	23	XA18	23	+18 V
XA19	23	XAl	17	+18 V
XA19	24	XA18	24	Rtn
XA19	24	XA1	18	Rtn
XA19	25	XA1	19	-18 V
XA19	25	XA18	25	-18 V
XA19	26	J14	D	D3 (8)
XA19	27	J14	H	D3 (1)
XA19	28	J14	E	D3 (4)
XA19	29	J14	BB	D4 (4)
XA19	30	J14	CC	D4 (2)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA19	31	J14	F	D3 (2)
XA19	32	J18B	12	DVM D1
XA19	33	J18B	8	DVM D5
XA19	34	J18B	9	DVM D4
XA19	34	J15	Y	DVM D4
XA19	35	J18B	10	DVM D3
XA19	35	J15	Z	DVM D3
XA19	36	J18B	11	DVM D2
XA19	36	J15	AA	DVM D2
XA19	37	J14	X	D4 (8)
XA19	38	J14	DD	D4 (1)
XA19	39	J14	JJ	D5 (2)
XA19	40	J15	A	+5 V isolated
XA19	40	P12	H	+5 V isolated
XA19	41	J14	HH	D5 (4)
XA19	42	J14	KK	D5 (1)
XA19	43	J14	FF	D5 (8)
XA19	44	XA17	38	± blank
XA19	45	J18B	4	DVM sign
XA19	46	J18A	10	BCD (2)
XA19	47	J18A	9	BCD (1)
XA20	1	S15B	8	Units (8)
XA20	1	XA21	14	Units (8)
XA20	2	S15A	1	Tens (1)
XA2O	2	XA21	26	Tens (1)
XA2O	3	S15A	2	Tens (2), Select 25°
XA2O	3	XA21	27	Tens (2), Select 25°
XA20	4	S15A	4	Tens (4)
XA20	4	XA21	28	Tens (4)
XA2O	5	S15A	8	Tens (8)

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA20	5	XA21	29	Tens (8)
XA20	6	XA8	25	MCA (2)
XA20	7	XA8	23	MCA (1)
XA20	8	XA13	14	Signal select (4)
XA20	9	XA13	15	Signal select (2)
XA20	10	NC		
XA20	11	XA8	24	MCA (4)
XA20	12	XAll	33	Time (1)
XA20	13	XAl1	32	Time (2)
XA20	14	XA11	31	Time (4)
XA20	15	XA13	12	Signal select (1)
XA20	16	XAl	21	Select el VS1 short
XA20	17	XAl	22	Select az VSl short
XA20	18	S15B	1	Units (1)
XA20	18	XA21	37	Units (1)
XA20	19	S15B	2	Units (2)
XA20	19	XA21	38	Units (2)
XA20	20	S15B	4	Units (4)
XA20	20	XA21	39	Units (4)
XA20	21	XA12	28	+15 Vsw
XA20	22	XA21	22	+5 V
XA20	23	XA21	23	+18 V
XA20	24	XA21	24	Rtn
XA20	25	XA21	25	-18 V
XA20	26	XA12	24	-15 V sw
XA20	27	NC		
XA20	28	NC		
XA20	29	NC		
XA20	30	XA12	5	Limit (1)
XA20	30	XA17	31	Limit (1)

Table 3-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA20	31	XA12	4	Limit (2)
XA20	32	XA12	3	Limit (4)
XA20	33	XA12	2	Limit (8)
XA20	34	XA12	1	Limit (16)
XA2O	35	XA14	14	Target (4)
XA20	36	XA14	12	Target (2)
XA20	37	XA14	13	Target (1)
XA20	38	XA14	1	Target off
XA20	39	XAl1	13	Select C VAC
XA20	40	XA14	24	Select motion compensation
XA20	41	XA4	7	Select servo test
XA20	42	NC		
XA20	43	P12	Y	-12 V
XA20	43	XA21	13	-12 V
XA20	44	NC		
XA20	45	XA12	6	-12 V sw B
XA20	46	NC		
XA2O	47	XA12	8	ROM sw +5 V
XA21	1	XA4	28	Comp data (1)
XA21	2	XA4	29	Comp data (2)
XA21	3	XA4	30	Comp data (4)
XA21	4	XA13	3	Select az
XA21	5	XA21	22	+5 V
XA21	6	XA9	35	Select S/N
XA21	7	XAl0	9	Select self test
XA21	8	NC		
XA21	9	XA4	10	Select V_h>35k
XA21	10	XAl	3	Select step response
XA21	10	XAll	3	Select step response
XA21	11	XA14	29	Select log H

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA21	12	XA13	8	Select K1 (t) polarity
XA21	13	XA20	43	-12 v
XA21	14	XA20	1	Units (8)
XA21	15	XA22	15	Select BIT tune
XA21	16	XA2	2	Select el API strobe
XA21	17	XA1	23	Selecp
XA21	18	XA4	15	Select 0.8 V BIT test
XA21	19	XA5	2	Select el servo analyzer
XA21	20	XA5	4	Select az servo analyzer
XA21	21	XA3	2	Select az API strobe
XA21	22	XA20	22	+5 V
XA21	22	XA21	5	+5 V
XA21	22	XA22	22	+5 V
XA21	23	XA20	23	+18 V
XA21	23	XA22	23	+18 V
XA21	24	XA20	24	Rtn
XA21	24	XA22	24	Rtn
XA21	25	XA20	25	-18 V
XA21	25	XA22	25	-18 V
XA21	26	XA20	2	Tens (1)
XA21	27	XA17	37	Tens (2) select 25°
XA21	27	XA20	3	Tens (2) select 25°
XA21	28	XA20	4	Tens (4)
2CA21	29	XA20	5	Tens (8)
XA21	30	XAl0	24	Not auto
XA21	31	XA14	32	Auto
XA21	32	XA15	3	System reset
XA21	32	XA17	34	System reset
XA21	32	XA22	39	System reset
XA21	33	S13	3	Auto low

Table 9-2. Control Monitor Wire List - Continued

From		To		Signal Name
XA21	34	S13	1	Auto hi
XA21	35	814	2	Reset hi
XA21	36	S14	4	Reset low
XA21	37	XA20	18	Units (1)
XA21	38	XA20	19	Units (2)
XA21	39	XA20	20	Units (4)
XA21	40	XA12	31	Select servo
XA21	41	XAl	31	Select -5 V
XA21	42	XA6	34	Servo (1)
XA21	43	XA6	32	Servo (2)
XA21	44	XA6	20	Servo (4)
XA21	45	XA6	35	Servo (-)
XA21	46	NC		
XA21	47	NC		
XA22	1	DS13	1	BIT 4 lamp
XA22	2	DS9	1	BIT in test lamp
XA22	3	DS19	1	BIT 10 lamp
XA22	4	J5	P	In test
XA22	4	S29	2	In test
XA22	5	DS15	1	BIT 6 lamp
XA22	6	XA16	30	28 V rtn
XA22	7	DS16	1	BIT 7 lamp
XA22	8	DS18	1	BIT 9 lamp
XA22	9	DS17	1	BIT 8 lamp
XA22	10	J3	L	Az manual control
XA22	11	J3	K	Manual
XA22	11	S17	5	Manual
XA22	12	S17	2	Az manual
XA22	13	XA16	10	+10 V
XA22	14	S18	2	El manual

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA22	15	XA21	15	Select BIT tune
XA22	16	J3	M	El manual control
XA22	17	DSll	1	BIT 2 lamp
XA22	18	DS10	1	BIT 1 lamp
XA22	19	NC		
XA22	20	J4	z	K1(t) BIT pass
XA22	21	NC		
XA22	22	XA21	22	+5 V
XA22	22	XA16	16	+5 V
XA22	23	XA21	23	+18 V
XA22	23	XA16	17	+18 V
XA22	24	XA21	24	Rtn
XA22	24	XA16	18	Rtn
XA22	25	XA21	25	-18 V
XA22	25	XA16	19	-18 V
XA22	26	DS14	1	BIT 5 lamp
XA22	27	DS12	1	BIT 3 lamp
XA22	28	J5	d	BIT 4
XA22	28	S21	3	BIT 4
XA22	29	J5	r	BIT 10
XA22	29	S21	9	BIT 10
XA22	30	J5	p	BIT 8
XA22	30	S21	7	BIT 8
XA22	31	J5	f	MCA BIT pass
XA22	32	J5	q	BIT 9
XA22	32	S21	8	BIT 9

Table 3-2. Control Monitor Wire List -Continued

From		To		Signal Name
XA22	33	S9E	12	SCA BIT pass
XA22	33	TJ	3	SCA BIT pass
XA22	34	NC		
XA22	35	NC		
XA22	36	NC		
XA22	37	XA19		Lamp test
XA22	38	NC		
XA22	39	XA21	32	System reset
XA22	40	NC		
XA22	41	NC		
XA22	42	S21	6	BIT 7
XA22	42	J5	n	BIT 7
XA22	43	J4	a	BIT 6
XA22	43	S21	5	BIT 6
XA22	44	J4	z	BIT 5
XA22	44	S21	4	BIT 5
XA22	45	J4	Y	BIT 3
XA22	45	S21	2	BIT 3
XA22	46	J5	R	BIT 2
XA22	47	J5	N	BIT 1
XF1	A	J15	JJ	Fuse A
XF1	B	J15	NN	Fuse B

3-4. TSEM General Operation Theory

Following TSEM general operation theory groups are keyed to the corresponding areas on the block diagram (Fig. 3-18) by use of a white letter placed overahexagonal symbol, i.e., (A).

(A) Prefire, Fire, and Wirecut Signals. Selected by the prefire, fire, and wirecut relays, then signal sare routed to the squib relay. When MSL I/F signal from the function rotary switch is applied to the squib relay, the prefire, fire, or wirecut signal is routed out of the TSEM and to one or more of the start, prefire, fire, wirecut, or MSL gone and MSL present functions. The MSL gone and MSL present functions simulate the condition of missile present during prefire checks and the condition of missile gone during postfire checks. The start function generates a start timer pulse that starts a timing sequence in the timing and balance circuits. The prefire, fire, and wirecut functions verify that signal current is of sufficient amplitude to activate the proper squibs in an actual mis - sile. Outputs of the prefire, fire, and wirecut functions are applied through a squib disconnect relay to the squib disconnect function. This function verifies proper operation of squib load relays.

(B) Timing and Balance Circuits. Generate a balance line signal that is applied to the wire signal function. This function generates an FM wire signal consisting of pitch and yaw components and a dc offset. The wire signal is applied to the pitch and yaw discriminator function. This function uses the wire signal to demodulate wire signals from the system under test. The wire signals are demodulated to develop pitch and yaw signals. These signals and timing signals from the timing and balance circuits are applied to the level detector function and self balance phase testing function. The level detector function detects and verifies proper wire signal amplitude, proper dc component amplitude and proper signal amplitude after the dc component is removed. The self balance phase testing function verifies correct phasing of the pitch and yaw components of the wire signal.

(C) Shear Pin Level Detector Function. Monitors the linear displacement transducer to determine whether proper shear pin displacement has taken place. The condition to be monitored is determined by positioning the function rotary switch. The function rotary switch also selects lamp test. The lamp test signal is applied to the lamp test and reset functions. These functions provide a confidence test of TSEM lamps and reset TSEM timing circuits.

3-5. TSEM Detailed Operation Theory

Following functional diagrams and associated theory described the TSEM. The theory is keyed to corresponding areas on the functional diagrams by use of a white letter placed over a hexagonal symbol, i. e., (A). Table 3-3 is a cross-reference table and Table 3-4 is the wire list for the TSEM.

a. TSEM Power Distribution Function (Fig. 3- 19). Power distribution to the TOW System Evaluation Missile (TSEM) is accomplished by connecting TSEM connector J2 to the helicopter 28 Vdc outlet (ammo bay). When the front panel ON/OFF circuit breaker/ switch is set to ON, 28 Vdc is applied to power supply PS1. Regulated +18 V and -18 V outputs are then supplied to the system. Resistor R5 and zener diode VR1, connected to regulated +18 V, create a drop of 5 V to develop +13 V for use in the TSEM. Similarly, -13 V is developed from -18 V by resistor R6 and zener diode VR2. Plus 18 V, -18V, +13V, and-13 V are monitored at J1 pins m, n, k, and p respectively.

(A) When the front panel ON /OFF switch is set to ON, excitation voltage is provided to light the front panel POWER lamp. POWER lamp (DS-1) lights and remains on as long as the front panel ON/OFF switch is set to ON.

b. TSEM Lamp Test and Reset Function (Fig. 3-20). Depending on the position of the front panel rotary switch, a ground, an airframe ground, or +18 V is supplied to cards Al thru A9 during tests of the TSEM. The front panel RESET pushbutton switch resets all flip-flops and the timer.

(A) The front panel RESET pushbutton switch resets all flip-flops in cards Al thru A9. When the front panel RESET pushbutton switch is pressed and released, a +13 V pulse resets all flip-flops to initialize the circuits for another test. The front panel RESET pushbutton switch, when pressed and released, also supplies a ground to reset the timer for the next count.

(B) When the front panel rotary switch is set to LAMP TEST, a ground is supplied to lamps DS-2 thru DS-13. This completes the circuit to light all front panel lamps, verifying that all lamps are operational for the TSEM functional tests.

c. Start Timer Function (Fig. 3-21). This function generates a start timer pulse for use in the balance line signal generator card A3. Verification that the timer sequence has been initiated is provided by the front panel START lamp.

(A) When a prefire current is sensed by the prefire current sensor, a pulse is sent to the balance line signal generator card A3. The pulse activates timing circuits in the balance line signal generator card A3. The prefire current, regardless of its magni - tude, is amplified and applied to an SR flip-flop. The high output of this flip-flop

turns start transistor on. A ground is provided through the transistor to light front panel START lamp (DS-2). The front panel START lamp, when on, indicates that the timer sequence has been initiated.

d. Prefire Function (Fig. 3-22). This function verifies that prefire current is of sufficient magnitude to activate prefire squibs in the TOW missile.

When prefire current of greater than 11 amperes is sensed by the prefire sensor, the prefire sensor relay is energized. Plus 13 V is applied through energized contacts of the relay to set an SR flip-flop. The high output of this flip-flop turns the prefire monitor transistor switch on. A ground is provided through the transistor switch to light front panel PREFIRE lamp (DS-3). The low output of the SR flip-flop is applied to an AND gate. The AND gate logic disconnects the prefire relay driver. Another input to the AND gate is the low output of an SR flip-flop controlled by the time interval t2 pulse from the balance line signal generator card A3. If the prefire current is not of sufficient amplitude, the prefire relay driver is then disconnected by the time interval t2 pulse.

e. Fire Function (Fig. 3-23). This function verifies that the fire current is of sufficient magnitude to activate fire squibs in the TOW missile.

(A) When fire current of greater than 8 amperes is sensed by the fire current sensor, the fire current sensor relay is energized. Plus 13 V is applied through energized contacts of the relay to set an SR flip-flop. The output of this flip-flop turns the fire transistor switch on. A ground is provided through the transistor switch to light front panel FIRE lamp (DS-4). The low output of the SR flip-flop is applied to an AND gate. The AND gate logic disconnects the fire relay driver. Another input to the AND gate is the low output of an SR flip-flop controlled by the time interval t4 pulse from the balance line signal generator card A3. If fire current is not of sufficient am - plitude, the fire relay driver is then disconnected by the time interval t4 pulse.

f Missile Present/Missile Gone Simulation Function (Fig. 3-23). This function simulates a missile present during prefire check and simulates a missile gone during postfire check.

(A) When fire current of greater than 8 am - peres is sensed by the fire current sensor, the fire current sensor relay is energized. Plus 13 V is applied through energized contacts of this relay to set an SR flip-flop. The high output of this flip-flop turns the fire transistor switch on. A ground is provided through the transistor switch to enable the auto relay. When the front panel rotary switch is set to any position except MSL GONE or MSL PRES, +18 V is supplied to energize the auto relay. Plus 18 V, applied through energized contacts of the auto relay or from the front panel rotary switch (when set to MSL GONE), turns msl gone transistor switch on. A ground is applied through the transistor switch to light front panel MSL GONE lamp (DS-7). The energized auto relay also ren.eves ground from the msl present line unless the front panel rotary switch is set to MSL PRES. The removal of ground from the missile present line indicates to the TSEM that the missile has been launched.

g. Prefire/Fire/Wirecut Squib Relay Function (Fig. 3-25). Proper functioning of the prefire/fire/wirecut squib load relays is tested by sensing the presence or absence of -13 V on the C2 contacts of prefire relay Kl, wirecut relay K2, and fire relay K3.

(A) When -13 V is removed from C2 contacts of the relays, the output of the AND gate in Al card is set to high. This output sets an SR flip-flop. The high output of this flip-flop turns squib disconnect transistor switch on. A ground is provided through the transistor switch to light front panel SQUIB DISC lamp (DS-6). The SQUIB DISC lamp, when on, indicates that the prefire/fire/wirecut squib load relays are functioning properly. If one or more squib load relay is not functioning properly, the output of the AND gate is low; the SR flip-flop does not set: and the front panel SQUIB DISC lamp does not light.

h. Wirecut Current Verification Function (Fig. 3-26). This function verifies that wirecut current is of sufficient magnitude to activate wirecut squibs in the TOW missile container.

(A) The wirecut sensor both senses a current and determines whether the current is of greater than 7 amperes magnitude. If current of greater than 7 amperes magnitude is applied to the wirecut current sensor, wirecut current adjust R12 is adjusted to energize the wirecut relay. Plus 13 V is applied through energized contacts of the relay to set an SR flip-flop. The high output of this flip-flop is applied to all AND gate controlling the wirecut transistor switch. The other input to the AND gate is from the circuit controlled by a one shot multivibrator. Initially, the input is low because of the state of the one shot multi vibrator. At the same time that the wirecut relay is energized, the one shot multivibrator is triggered; a logic high is monitored at testpoint TP1; and another SR flip-flop is set to provide a logic high to the AND gate controlling the wirecut transistor switch. Now, two logic highs

are applied to the AND gate. The output of the AND gate is a high that turns wirecut transistor switch on. A ground is provided through the transistor switch to light front panel WIRECUT lamp (DS-5). Low outputs of the two SR flip-flops in the circuit are applied to another AND gate to disconnect the wirecut relay driver. If wirecut current is less than 7 amperes magnitude, the wirecut sensor does not energize the wirecut relay and front panel WIRECUT lamp (DS-5) remains off. The wirecut relay is then disconnected after 250 msec by action of the one shot multivibrator.

Wire Signal Level Detection Function (Fig. 3-27). This circuit has the following three major detection functions:

(1) Detects and verifies that wire signal peak-to-peak amplitude is greater than +35, 5 V.

(2) Detects and verifies that -12 V component of wire signal is present.

(3) Detects and verifies that wire signal peak-to-peak amplitude is 0. 0 ± 0. 2 Vdc after the -12 V component is removed.

(A) The detector circuit detects the positive peak level and the negative peak level of the wire signal from the pitch discriminator card A5. The positive peak level is applied to one input of a differential amplifier through a buffer. The negative peak level is applied to the second input of the same differential amplifier through another buffer. The amplified peak-to- peak voltage is applied to a comparator. If the peak-to-peak voltage is of sufficient amplitude, the comparator completes the signal path to light front panel WIRE SIGNAL lamp (DS-8).

(B) The zero Vdc component of the' wire signal is sampled from the filtered wire signal by a window comparator. If the level of the signal is 0.0 ± 0.2 Vdc, the window comparator triggers an SR flip-flop. The high output of this flip-flop turns zero transistor switch on. A ground is provided through the transistor switch to light front panel ZERO lamp (DS-10). If a wire signal of sufficient amplitude is present, a transistor switch is turned on. A ground is applied to the output of the comparator to disable front panel ZERO lamp (DS-10).

(C) The -12 V component is removed from the wire signal by a filter. The filtered signal is applied to a comparator through a buffer. If the dc component is of sufficient amplitude, an SR flip-flop is triggered. The high output of this flip-flop turns -12 V transistor switch on. A ground is provided through the transistor switch to light front panel -12 lamp (DS-9).

j. Shear Pin Level Detection Function (Fig. 3-28). This function determines if the plunger provides proper shear pin displacement.

(A) In the noncalibrated mode, transducer displacement voltage is applied to a window comparator. The f rent panel SHEAR PIN lamp (DS-13) lights if the plunger depresses the shear pin the desired distance. In the SP "GO" mode, the SP"GO" relay is energized. A reference voltage is applied to the window comparator to verify that the window comparator and the lamp drivers are operational.

(B) In the noncalibrated mode, input to the window comparator is set to high. This prevents the front panel SHEAR PIN lamp (DS-13) from lighting. In the SP"O" mode, the SP"O" mode relay is energized. This provides transducer displacement voltage to the SP"O" position window comparator. The front panel SHEAR PIN lamp (DS-13) lights if, with the plunger loaded, the simulated shear pin has returned to its uncle - pressed position.

(C) A spring loaded platform, representing a load equivalent to the missile/container shear pin mechanism, coupled to a linear displacement transducer, is provided on the TSEM for measuring plunger movement. Pretravel has been added to the TSEM shear pin transducer. A displacement of 1/8 inch in the transducer, representing a shear pin displacement between 2.241 ± 0.00 inches and 2.254 ± 0.001 inches with respect to the trunnion reference line, produces a nominal 10 Vdc output.

k. Timing Signals and Line Signal Generator Function (Fig. 3-29). This function provides timing signals to the squib card Al, self balance phase test card A4, self test card A2, and the XM65. The function also provides a balance line signal to self test card A9 for deviation of pitch and yaw voltage controlled oscillator center frequencies.

(A) The timing sequence of the balance line signal generator is initiated when a start timer pulse from squib card A1 is received. The start timer pulse triggers the first one shot multivibrator. This one shot in turn triggers the next one shot mul - tivibrator. Timing intervals tl, t2, t3, and t4 from the one shot multivibrator outputs can be monitored at J1.

(B) Timing intervals tl and t3, of 800 and 250 msec durations respectively, are applied to the inverting input of an amplifier. Timing interval t2, of 220 msec duration, is applied to the non-inverting input of the

same amplifier. The output of this amplifier is the balance line signal that is used to deviate the pitch and yaw frequencies in the self test card A9 and in the XM65. The pitch/yaw balance relay is energized only when the timing intervals tl, t2, and t3 are generated. This is due to action of an OR gate. When the pitch/yaw balance relay is energized, self balance line signal is switched to pins 32 and 34.

(C) The self balance signal from output of an amplifier is applied to the input of another amplifier. The output of this second amplifier is routed to the self test card A9 through pin 22.

l. Pitch and Yaw Discriminator Function (Fig. 3-30). Pitch and yaw components of the FM wire signal are modulated and are routed to the self balance phase tester card A4 for correct phase verification.

(A) In the self test mode, MSL I/F relay is energized and the wire signal from self test card A9 is applied to a differential amplifier. When the MSL I/F relay is not energized, wire signals from the XM65 are applied to the differential amplifier. The output of this differential amplifier is applied to both the pitch discriminator and yaw discriminator circuits.

(B) The pitch signal, carried by the sine wave component of the wire signal, is filtered and applied to a clipping circuit. The clipped signal is then routed to a phase locked loop monolithic signal conditioner and demodulator. The signal conditioner and demodulator consists of a voltage controlled oscillator, phase detector, amplifier, and low pass filter. The output of the phase locked loop signal conditioner and demodulator is amplified and applied to self balance phase tester card A4.

(C) The wire signal from pitch discriminator card A5 is clipped and applied to a phase locked loop monolithic signal conditioner and demodulator. The signal conditioner and demodulator consists of a voltage controlled oscillator, amplifier, phase detector, and low pass filter. The output of the phase locked loop signal conditioner and demodulator is filtered and amplified. The amplified signal is applied to self balance phase tester card A4.

m. Self Balance Phase Testing Function (Fig. 3-31). This function verifies correct phasing of the wire signal yaw and pitch frequency components.

(A) Demodulated pitch component of the wire signal is applied as inputs of two comparators. The output of the first comparator is a square wave function with positive peaks corresponding to timing pulses tl and t3, and a negative peak corresponding to timing pulse t2. The output of the second comparator is an inverted output of the first comparator. The low output of the first comparator is applied to a NOR gate. Timing pulse t2 from the balance line signal generator card A3 is applied to the same NOR gate. If these timing pulses are in phase, the NOR gate generates a high to an SR flip-flop. This flip-flop in turn sets one input to an AND gate to high. A low from the second comparator, corresponding to timing pulse t3, is applied to another NOR gate. The t3 test pulse from balance line signal generator card A3 is applied to the same NOR gate. If the two pulses are in phase, the NOR gate applies a high to the AND gate. The AND gate sets an SR flip-flop that turns pitch transistor switch on. A ground is provided through the transistor switch to light front panel PITCH lamp (DS-11).

Demodulated yaw component of the wire signal is applied as inputs of two comparators. The output of one of these conl - parators is a square wave function with positive peaks corresponding to timing pulses tl and t3, and a negative peak corresponding to a timing pulse t2. The output of the second comparator is an inverted output of the first comparator. The low output of the first comparator, corresponding to timing pulse t2, is applied to a NOR gate. The t2 pulse from the balance line signal generator card A3 is applied to the same NOR gate. If the two pulses are in phase, the NOR gate sets an SR flip-flop. This flip-flop in turn sets one input of an AND gate to high. A low from the second comparator, corresponding to timing pulse t3, is applied to another NOR gate. The t3 pulse from the balance line signal generator card A3 is applied to the same NOR gate. Lf the two pulses are in phase, the NOR gate provides a high as the second input of the AND gate. The output of the AND gate sets an SR flip-flop that turns yaw transistor switch on. A ground is provided through the transistor switch to light front panel YAW lamp (DS-12).

n. FM Wire Signal Generating Function (Fig. 3-32). This function generates a FM wire signal consisting of pitch and yaw frequency components and a dc offset.

(A) During internal function checks, MSL I/F relay is energized. The balance line signal from balance line signal generator card A3 is applied through the energized contacts of the MSL I/F relay to pitch deviation adjust R4 and yaw deviation adjust R25.

(B) The pitch component of the wire signal is generated by a voltage controlled oscilla-

tor. The square wave output of the voltage controlled oscillator is filtered of its har - monic components by an active low pass filter. The resulting sine wave pitch signal is applied to a summing amplifier.

Ⓒ The yaw component of the sine signal is generated by a second voltage controlled oscillator. The square wave output of this voltage controlled oscillator is a second input of the summing amplifier.

Ⓓ Sine wave pitch signal is summed with the square wave yaw signal with sinusoidal varying peaks. This composite signal, containing the pitch and yaw information, is amplified through a push-pull amplifier. A negative dc voltage component is added in the output transformer T1.

A pulse from the balance line signal generator card A3 turns balance line signal transistor switch on. The ground provided through the transistor switch activates a balance line signal relay in pitch discriminator card A5. The energized relay provides a ground to the wire signal thereby removing the -12 Vdc voltage from the FM wire signal.

Table 3-3. TSEM Modules/Functional Diagram Cross-Reference

Card/Subassembly	Functional Diagram Figure Number
Al	Figures 3-22, 3-23, 24,
A2	Figures 3-25, 3-26,
A3	Figure 3-29
A4	Figure 3-31
A5	Figures 3-30, 3-32
A6	Figure 3-30
A7	Figure 3-27
A8	Figures 3-25, 3-28,
A9	Figure 3-32
Power distribution	Figure 3-19
Lamps	Figure 3-20
Start timer	Figure 3-21

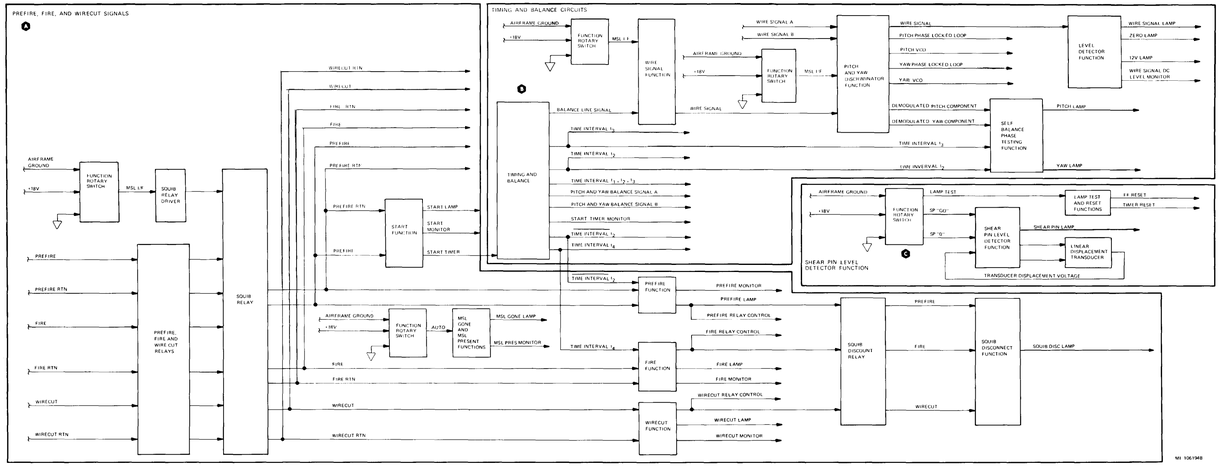
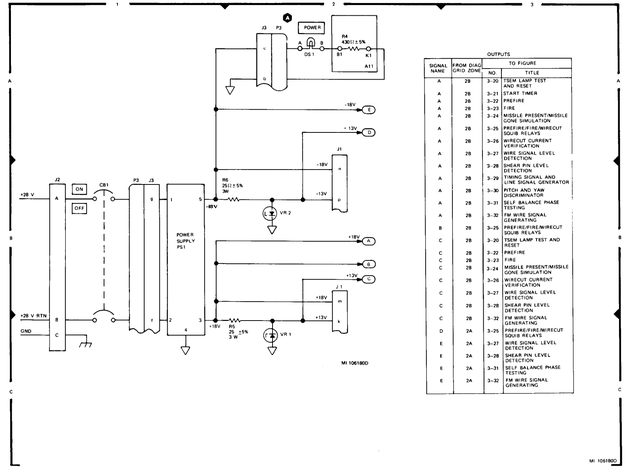


Figure 3-18. TSEM Block Diagram



SIGNAL NAME	FROM DIAG CIRCU ZONE	OUTPUTS TO FIGURE NO.	TITLE
A	2B	3-20	TSEM LAMP TEST AND RESET
A	2B	3-21	START TIMER
A	2B	3-22	PREFIRE
A	2B	3-23	FIRE
A	2B	3-24	MISSILE PRESENT/MISSILE GONE SIMULATION
A	2B	3-25	PREFIRE/FIRE/NWIRECUT SQUIB RELAYS
A	2B	3-26	WIRECUT CURRENT VERIFICATION
A	2B	3-27	WIRE SIGNAL LEVEL DETECTION
A	2B	3-28	SHEAR PIN LEVEL DETECTION
A	2B	3-29	TIMING SIGNAL AND LINE SIGNAL GENERATOR
A	2B	3-30	PITCH AND YAW DISCRIMINATOR
A	2B	3-31	SELF BALANCE PHASE TESTING
A	2B	3-32	FM WIRE SIGNAL GENERATING
B	2B	3-25	PREFIRE/FIRE/NWIRECUT SQUIB RELAYS
C	2B	3-20	TSEM LAMP TEST AND RESET
C	2B	3-22	PREFIRE
C	2B	3-23	FIRE
C	2B	3-24	MISSILE PRESENT/MISSILE GONE SIMULATION
C	2B	3-26	WIRECUT CURRENT VERIFICATION
C	2B	3-27	WIRE SIGNAL LEVEL DETECTION
C	2B	3-28	SHEAR PIN LEVEL DETECTION
C	2B	3-32	FM WIRE SIGNAL GENERATING
D	2A	3-25	PREFIRE/FIRE/NWIRECUT SQUIB RELAYS
E	2A	3-27	WIRE SIGNAL LEVEL DETECTION
E	2A	3-28	SHEAR PIN LEVEL DETECTION
E	2A	3-31	SELF BALANCE PHASE TESTING
E	2A	3-32	FM WIRE SIGNAL GENERATING

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Figure 3-19. TSEM Power Distribution Functional Diagram

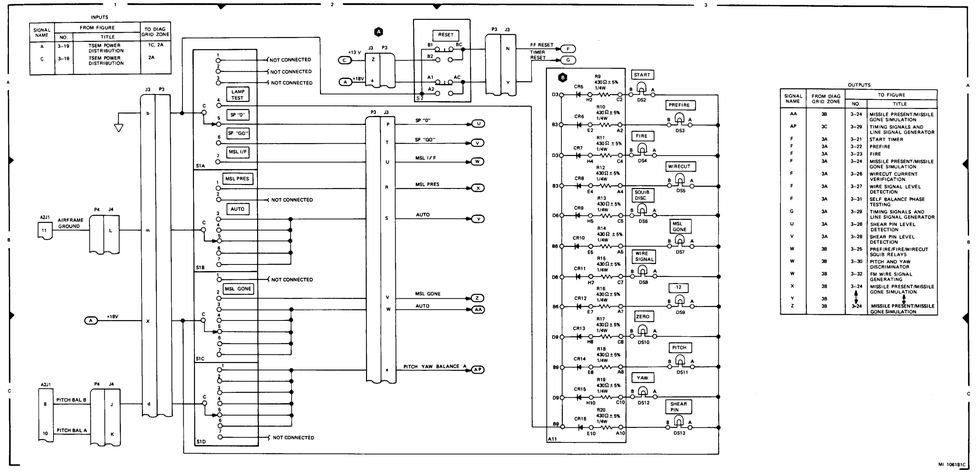
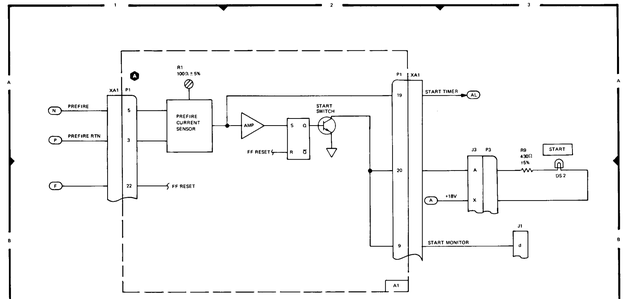


Figure 3-20. TSEM Lamp Test and Reset Functional Diagram



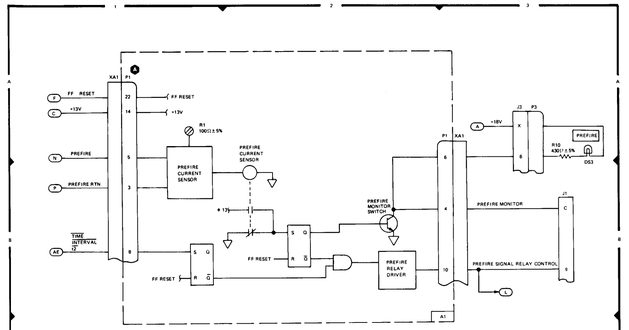
INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	2B
F	3-20	TSEM LAMP TEST AND RESET	1B
N	3-25	PREFIRE/FIRE/N/RECUT SQUIB RELAYS	1A
P	3-25	PREFIRE/FIRE/N/RECUT SQUIB RELAYS	1A

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO FIGURE TITLE
AL	3A	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR

Figure 3-21. Start Timer Functional Diagram



INPUTS

SIGNAL NAME	FROM FIGURE NO	FROM FIGURE TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	3A
AE	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	1B
C	3-19	TSEM POWER DISTRIBUTION	1A
F	3-20	TSEM LAMP TEST AND RESET	1A
N	3-25	PREFIRE/FIRE/W/RECUT SQUIB RELAYS	1A
P	3-25	PREFIRE/FIRE/W/RECUT SQUIB RELAYS	1B

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
L	3B	3-25	PREFIRE/FIRE/W/RECUT SQUIB RELAYS

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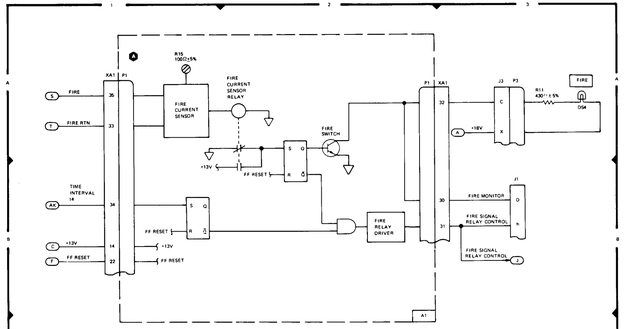
Figure 3-22. Prefire Functional Diagram



INPUTS			
SIGNAL NAME	FROM FIGURE NO	TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	3A
AK	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	1B
C	3-19	TSEM POWER DISTRIBUTION	1B
F	3-20	TSEM LAMP TEST AND RESET	1B
S	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS	1A
T	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS	1A

OUTPUTS			
SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO	TO FIGURE TITLE
J	3B	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS

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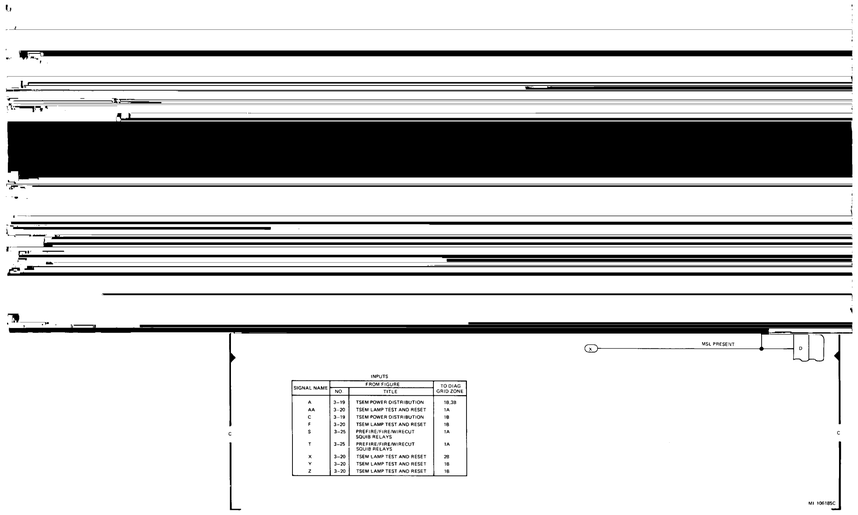
Figure 3-23. Fire Functional Diagram



INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO QUAD GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	1B,3B
AA	3-20	TSEM LAMP TEST AND RESET	1A
C	3-19	TSEM POWER DISTRIBUTION	1B
F	3-20	TSEM LAMP TEST AND RESET	1B
S	3-25	PREFIRE/FIRE/W/RECUT SQUIB RELAYS	1A
T	3-25	PREFIRE/FIRE/W/RECUT SQUIB RELAYS	1A
X	3-20	TSEM LAMP TEST AND RESET	2B
Y	3-20	TSEM LAMP TEST AND RESET	1B
Z	3-20	TSEM LAMP TEST AND RESET	1B

Figure 3-24. Missile Present Missile Gone Simulation Functional Diagram

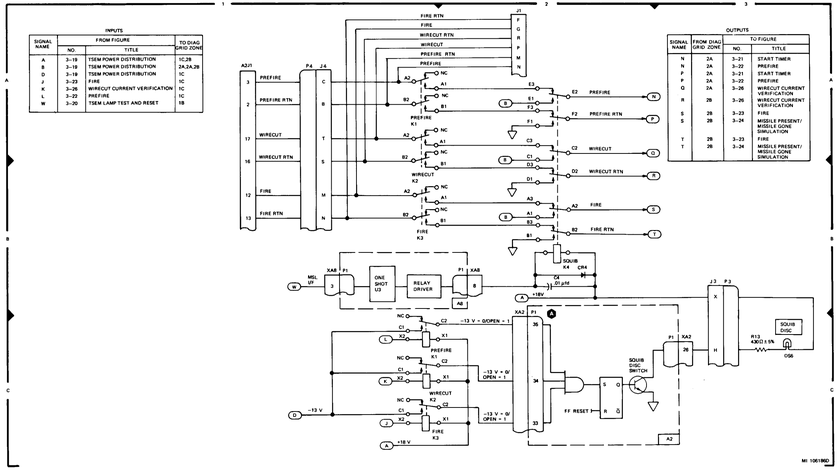


Figure 3-25. Prefire/Fire/Wirecut Squib Relays Functional Diagram

INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG. GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	3B
C	3-19	TSEM POWER DISTRIBUTION	1B
F	3-20	TSEM LAMP TEST AND RESET	1B
Q	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS	1B
R	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS	1B

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO FIGURE TITLE
K	3C	3-25	PREFIRE/FIRE/WIRECUT SQUIB RELAYS

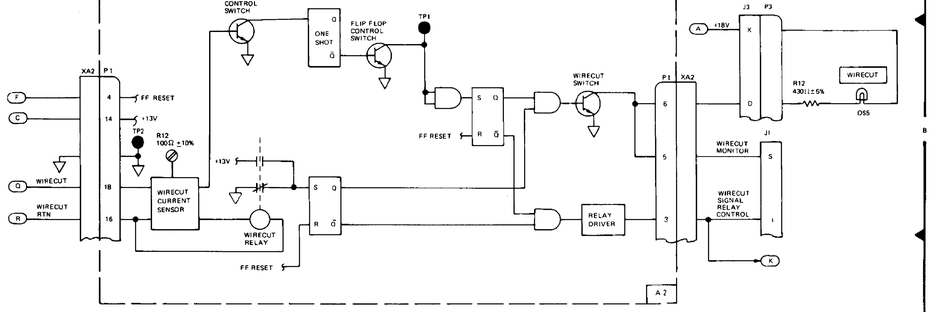


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Figure 3-26. Wirecut Current Verification Functional Diagram

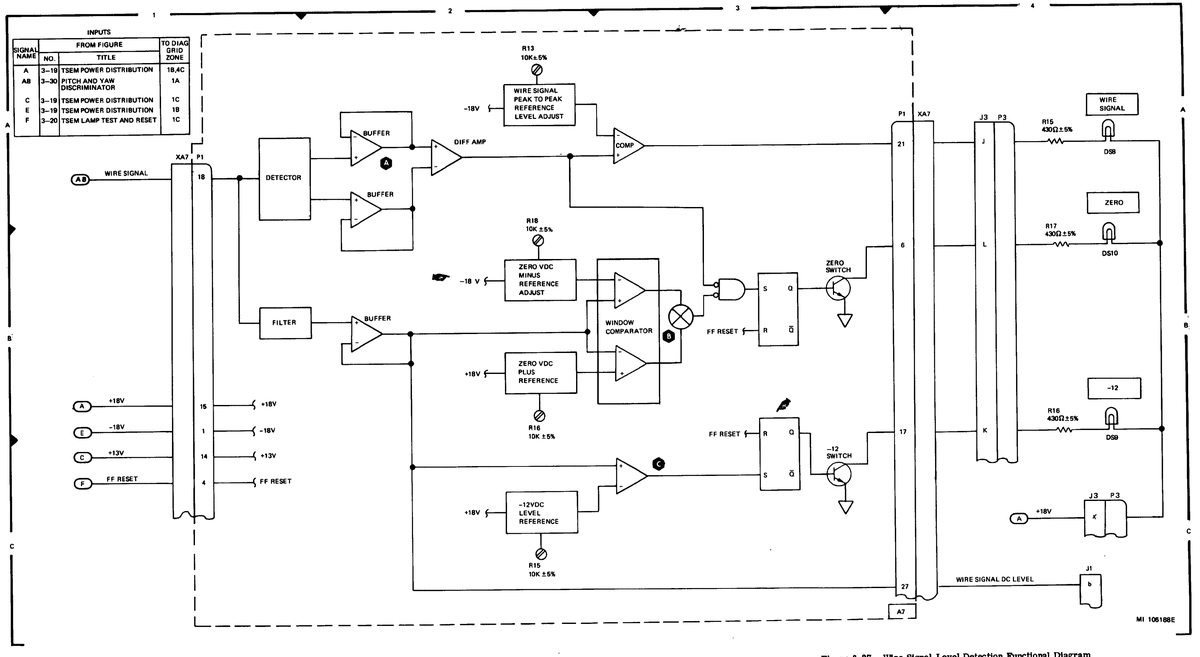


Figure 3-27. Wire Signal Level Detection Functional Diagram

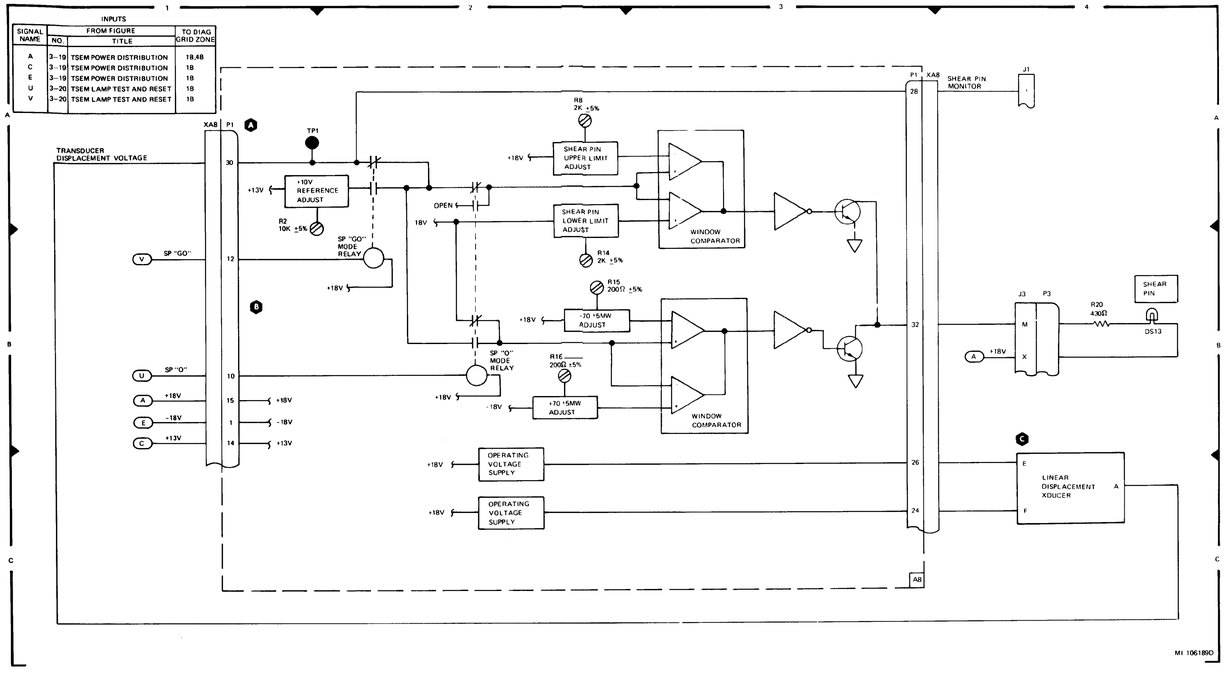
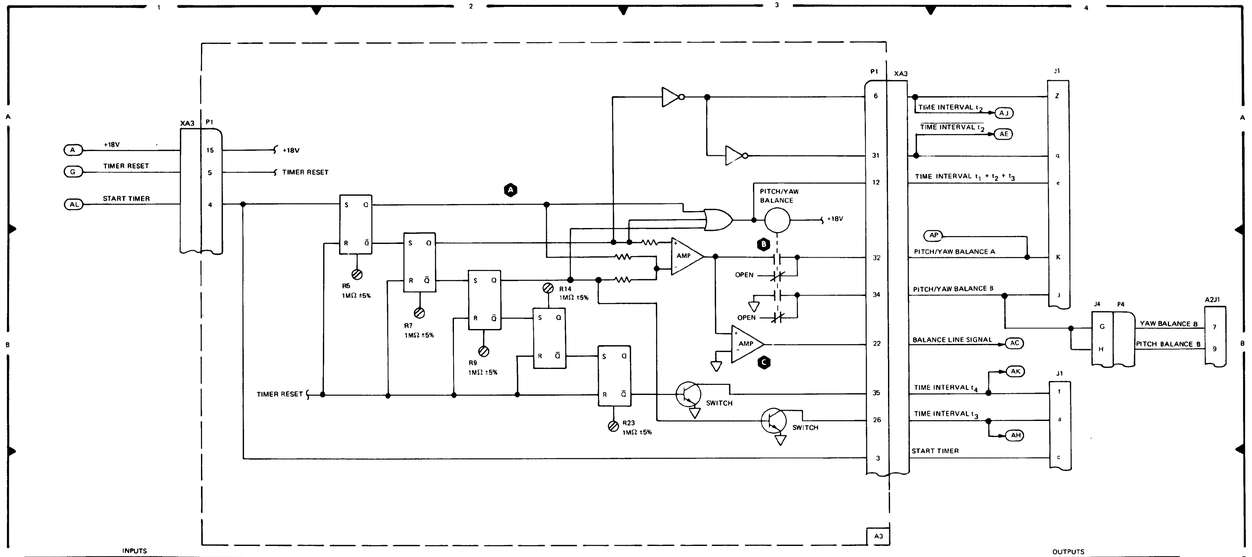


Figure 3-28. Shear Pin Level Detection Functional Diagram



INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	1A
AL	3-21	START TIMER	1A
AP	3-20	TSEM LAMP TEST AND RESET	4B
G	3-20	TSEM LAMP TEST AND RESET	1A

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO FIGURE TITLE
AC	4B	3-32	FM WIRE SIGNAL GENERATING
AE	4A	3-22	PREFIRE
AE	4A	3-32	FM WIRE SIGNAL GENERATING
AH	4B	3-31	SELF BALANCE PHASE TESTING
AJ	4A	3-31	SELF BALANCE PHASE TESTING
AK	4B	3-23	FIRE

Figure 3-29. Timing Signals and Line Signal Generator Functional Diagram

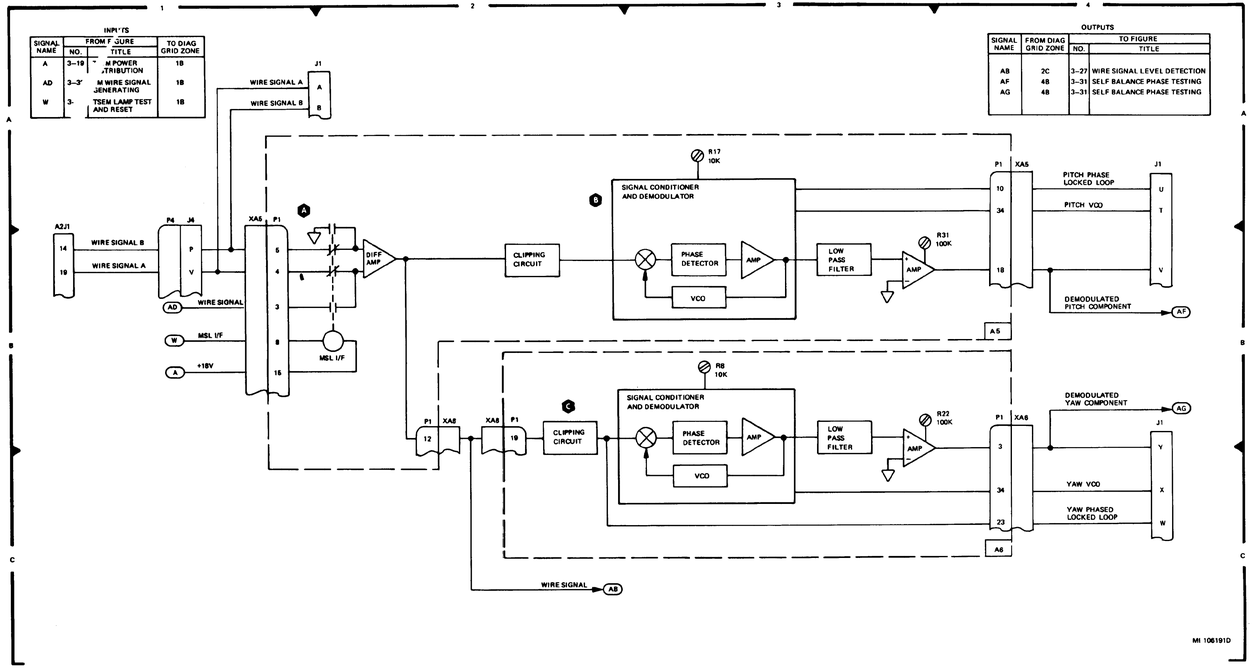


Figure 3-30. Pitch and Yaw Discriminator Functional Diagram

INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	4C
AF	3-30	PITCH AND YAW DISCRIMINATOR	1A
AG	3-30	PITCH AND YAW DISCRIMINATOR	1B
AH	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	1C
AJ	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	1B
E	3-19	TSEM POWER DISTRIBUTION	1C
F	3-20	TSEM LAMP TEST AND RESET	1C

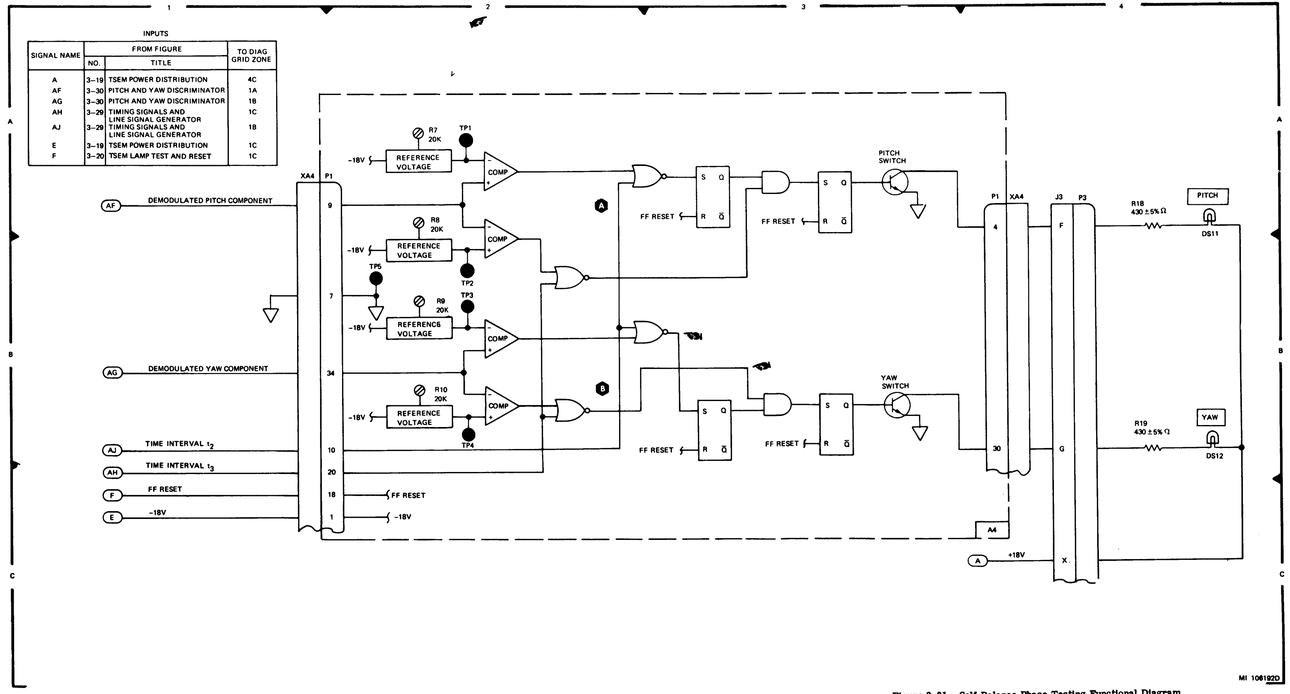


Figure 3-31. Self Balance Phase Testing Functional Diagram

INPUTS

SIGNAL NAME	FROM FIGURE NO.	FROM FIGURE TITLE	TO DIAG GRID ZONE
A	3-19	TSEM POWER DISTRIBUTION	1B, 5B
AC	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	1B
AE	3-29	TIMING SIGNALS AND LINE SIGNAL GENERATOR	5C
C	3-19	TSEM POWER DISTRIBUTION	1B
E	3-19	TSEM POWER DISTRIBUTION	1C
W	3-20	TSEM LAMP TEST AND RESET	1B

OUTPUTS

SIGNAL NAME	FROM DIAG GRID ZONE	TO FIGURE NO.	TO FIGURE TITLE
AD	5B	3-30	PITCH AND YAW DISCRIMINATOR

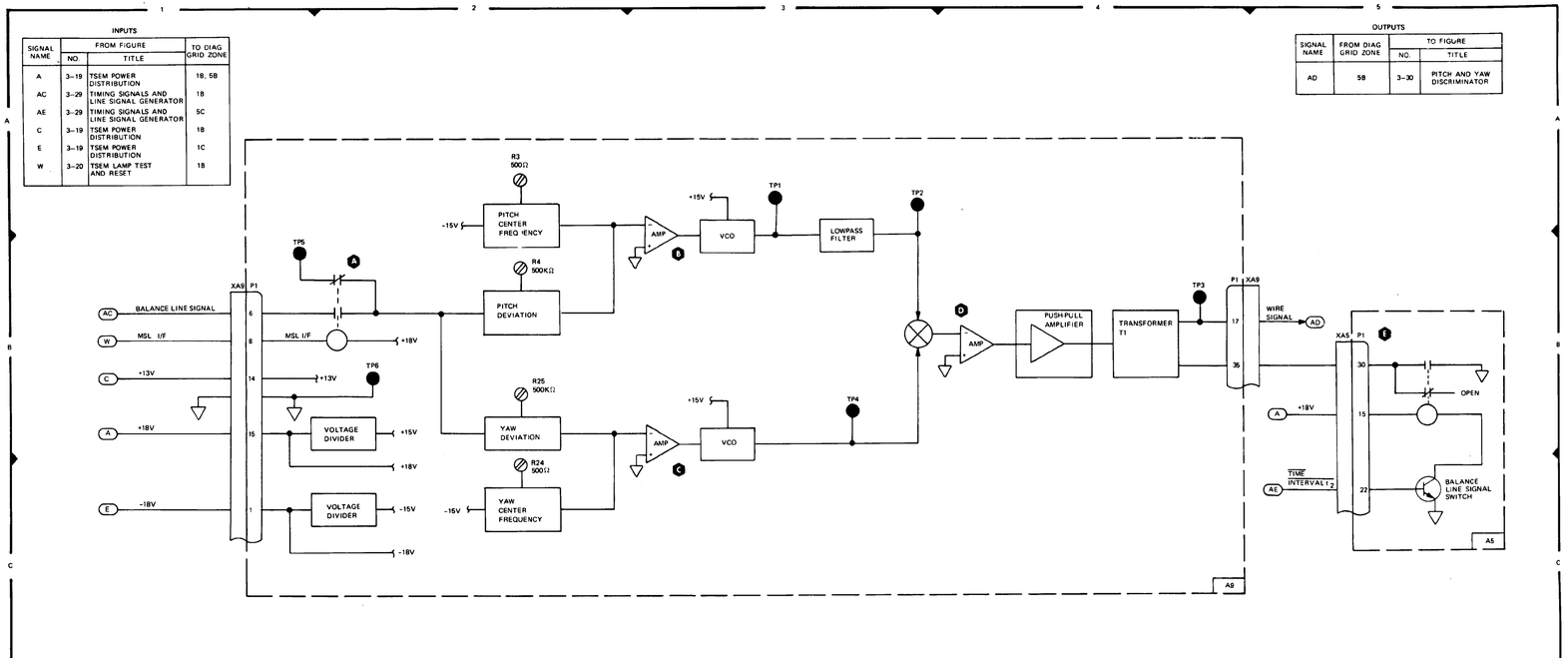


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Figure 3-32. FM Wire Signal Generating Functional Diagram

3-5.1. TSEM Wire List.

CAUTION

Exercise care when connecting and disconnecting cables to prevent damage to equipment due to electrostatic discharge and erroneous connections. Prior to connecting or disconnecting cables, be sure all power is turned off and that sources of electrostatic charge are not present at either end of the cables. Since the majority of the pins on each cable lead to components which are ESD, personnel must not touch, or otherwise allow static charges to reach the exposed pins of connector cables. A protective cap must be installed on any connector when cable is disconnected.

The tabular list of the TSEM interconnection wiring is given in table 3-4. The From column lists the origin of the wire and the To column lists the termination of the wire.

Table 3-4. TSEM Wire List

From		To		Signal Name
A11	A2	DS03	B	
A11	A4	DS05	B	
A11	A5	DS07	B	
A11	A7	DS09	B	
A11	A8	DS1l	B	
A11	A10	DS13	B	
A11	B1	DS0l	B	
A11	B9	S01A	04	
A11	C2	DS02	B	
A11	C4	DS04	B	
A11	C5	DS06	B	
A11	C7	DS08	B	
A11	C8	DS1O	B	
A11	C 10	DS12	B	
A11	E2	P03	B	
A11	E4	P03	D	
A11	E5	P03	E	
A11	B3	A11	D03	
A11	D3	A11	B03	
A11	E7	P3	K	
A11	E8	P3	F	
A11	E 10	P3	M	
A11	H2	P3	A	
A11	H4	P3	C	
A11	H5	P3	H	
A11	H7	P3	J	
A11	H8	P3	L	
A11	H1O	P3	G	
A11	K1	S1A	C	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
All	K1	P3	b	
A2J1	1	NC		
A2J1	2	P4	B	Prefire Rtn
A2J1	3	P4	C	Prefire
A2J1	4	P4	D	Missile Present
A2J1	5	NC		
A2J1	7	P4	G	Yaw Bal B
A2J1	8	P4	J	Yaw Bal A
A2J1	9	P4	H	Pitch Bal B
A2J1	10	P4	K	Pitch Bal A
A2J1	11	P4	L	Airframe Gnd
A2J1	12	P4	M	Fire
A2J1	13	P4	N	Fire Rtn
A2J1	14	P4	P	Wiresig B
A2J1	15	NC		
A2J1	16	P4	S	Wirecut Rtn
A2J1	17	P4	T	Wire Cut
A2J1	18	NC		
A2J1	19	P4	V	Wire Sig A
A2J1	20	NC		
Cl	A	K1	X2	
Cl	B	K1	Xl	
C2	A	K2	X02	
C2	B	K2	X0l	
C3	A	K3	X02	
C3	B	K3	X0l	
C4	A	K4	X02	
C4	B	K4	X0l	

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
C5	A	XA2	08	
C5	B	XA2	07	Ground, TSEM
C6	A	S2	BC	
C6	B	S2	B1	
CB1	1	J2	A	+28 VDC
CB1	2	P3	g	
CB1	3	J2	B	+28 VDC Rtn
CB1	4	P3	f	
CR1	ANOD	K1	X2	
CR1	CATH	K1	Xl	
CR2	ANOD	K2	X2	
CR2	CATH	K2	Xl	
CR3	ANOD	K3	X2	
CR3	CATH	K3	Xl	
CR4	ANOD	K4	X2	
CR4	CATH	K4	Xl	
DS1	A	P3	C	
DS1	B	All	B0l	
DS2	A	DS3	A	
DS2	B	All	C02	
DS3	A	DS2	A	
DS3	A	DS4	A	
DS3	B	All	A02	
DS4	A	DS3	A	
DS4	A	DS5	A	
DS4	B	All	C04	

Table 3-4. T8EM Wire List - Continued

From		To		Signal Name
DS5	A	DS4	A	
DS5	A	DS6	A	
DS5	B	All	A04	
DS8	A	DS5	A	
DS8	A	DS7	A	
DS6	B	All	C05	
DS7	A	DS6	A	
DS7	A	DS8	A	
DS7	B	All	A5	
DS8	A	DS7	A	
DS8	A	DS9	A	
DS8	B	All	C7	
DS9	A	DS8	A	
DS9	A	DS1O	A	
DS9	B	All	A5	
DS1O	A	DS9	A	
DS1O	A	DS1l	A	
DS1O	B	All	C8	
DS1l	A	DS1O	A	
DS1l	A	DS12	A	
DS11	B	All	A08	
DS12	A	DS1l	A	
DS12	A	DS13	A	
DS12	B	All	Cl0	
DS13	A	S01C	C	
DS13	A	DS12	A	
DS13	B	All	AlO	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
J1	A	XA5	4	Wire Signal A
J1	B	XA5	5	Wire Signal B
J1	C	XA1	4	TP22, Prefire Mon
J1	D	XA1	30	TP23, Fire Ind Mon
J1	E	NC		
J1	F	K3	B2	Fire Rtn
J1	G	K3	A2	Fire
J1	H	J2	m	Airframe Gnd
J1	J	XA3	34	Rtn P & Yaw Bal B
S1	K	XA3	32	TP1l, P & Yaw Bal A
J1	L	XA1	20	MSL Pres
J1	M	K1	B2	Prefire Rtn
J1	N	K1	A2	Prefire
J1	P	K2	A2	Wire Cut
J1	R	K2	B2	Wire Cut Rtn
J1	S	XA2	5	TP25, Wire Cut Mon
J1	T	XA5	34	TP1 , Pitch VCO
J1	U	XA5	10	TP2, Inp P PH LK LP
J1	V	XA4	09	TP3 , P Discr output
J1	W	XA6	23	TP4, Inp Yaw PH LK LP
J1	X	XA6	94	TP5 , Yaw Vco
J1	Y	XA4	34	TP6, Yaw Discr output
J1	Z	XA4	10	TP7 , Time Intvl-T02
J1	a	XA3	26	TP8 , Time Intvl-T03
J1	b	XA7	27	TP9, Wire Sig DC LVL
J1	c	XA3	3	TP10, Inp Bal Line Sig
J1	d	XA1	9	TP24, Start Mon
J1	e	XA3	12	TP12 , Int-T0l+T02+-T03
J1	f	XA1	24	TP13, Time Intvl-T04
J1	g	XA1	10	TP14, Rly Prefire Sig

Table 3-4. **TSEM** Wire List - Continued

From		To		Signal Name
J1	h	XAl	31	TP15, Fire Sig Rly
J1	i	XA9	7	Ground TSEM
J1	j	XA2	3	TP16, Wire Cut Sig Rly
J1	k	XA9	14	TP17, Reg Vltg +13V
J1	m	TB3	6	TP18, Reg Vltg +18V
J1	n	XA9	1	TP19, Reg Vltg -18V
J1	p	XA9	2	TP20, Reg Vltg -13V
J1	q	XAl	8	TP21, Time Int-T02
J1	r	XA8	28	Shear Pin
J1	s	NC		
J1	t	NC		
J1	u	NC		
J1	v	NC		
J1	w	NC		
J1	x	NC		
J1	y	NC		
J1	z	NC		
J1	AA	NC		
J1	BB	NC		
J1	CC	NC		
J1	DD	NC		
J1	EE	NC		
J1	FF	NC		
J1	GG	NC		
J1	HH	NC		
J1	J J	NC		
J1	KK	NC		
J1	LL	NC		
J1	MM	NC		
J1	NN	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
J1	PP	NC		
J1	SHLD	TB2	4	Ground, TSEM
J2	A	CB1	1	+28 VDC
J2	B	CB1	3	+28 VDC Rtn
J2	C	J2	FLG	Chassis Ground
J2	FLG	J2	C	Chassis Ground
J2	A	XAl	20	
J2	B	XAl	6	
J2	C	XAl	32	
J2	D	XA2	6	
J2	E	XAl	21	
JS	F	XA4	4	
J2	G	XA4	30	
J2	H	XA2	26	
J2	J	XA7	21	
J2	K	XA7	17	
J2	L	XA7	6	
J2	M	XA8	82	
J2	N	XA2	8	
J2	P	XA8	10	
J2	R	XAl	28	
J2	S	XAl	27	
J2	T	XA8	12	
J2	U	XA9	8	
J2	V	XAl	24	
J2	W	XAl	26	
J2	X	TBl	6	
J2	Y	XA3	5	
J2	Z	XA9	14	

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
J3	a	TB2	6	
J3	b	TB2	1	Gnd
J3	c	KM	1	-18V
J3	d	J4	J	
J3	e	XA3	32	
J3	f	PS1	2	
J3	g	PS1	1	
J3	h	NC		
J3	i	NC		
J3	j	NC		
J3	k	NC		
J3	m	J1	H	Airframe Gnd
J3	m	J4	L	
J3	n	NC		
J3	p	NC		
J3	q	NC		
J3	r	NC		
J4	A	SHLDS		Ground, TSEM
J4	B	K1	B2	
J4	c	K1	A2	
J4	D	XAl	28	
J4	E	NC		
J4	F	NC		
J4	G	J4	H	
J4	G	XA3	34	
J4	H	J4	G	
J4	J	J3	d	
J4	J	J4	K	
J4	K	J4	J	

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
J4	L	J3	m	
J4	M	K3	A2	
J4	N	K3	B2	
J4	P	XA5	5	
J4	R	NC		
J4	S	K2	B2	
J4	T	K2	A2	
J4	U	NC		
J4	V	XA5	4	
J4	W	NC		
J4	X	NC		
J4	Y	NC		
J4	Z	NC		
J4	a	NC		
J4	b	NC		
J4	c	NC		
J4	SHLD	TB2	2	Ground, TSEM
K1	Al	K4	E3	
K1	Al	R1	A	
K1	A2	J1	N	Prefire
K1	A2	J4	C	
K1	A3	NC		
K1	B1	K4	F3	
K1	B1	R1	B	
K1	B2	J1	M	Prefire Rtn
K1	B2	J4	B	
K1	B3	NC		
K1	Cl	K2	Cl	
K1	Cl	TB3	02	-13V

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
K1	C2	XA2	35	
K1	C3	NC		
K1	Xl	Cl	B	
K1	Xl	CR1	CATH	
K1	Xl	K2	X1	
K1	X2	Cl	A	
K1	X2	CR1	ANOD	
K1	X2	XAl	10	
K2	Al	K4	C3	
K2	A2	J1	P	Wire Cut
K2	A2	J4	T	
K2	A3	NC		
K2	B1	K4	D3	
K2	B2	J1	R	Wire Cut Rtn
K2	B2	J4	S	
K2	B3	NC		
K2	Cl	K1	Cl	
K2	Cl	K3	Cl	
K2	C2	XA2	34	
K2	C3	NC		
K2	Xl	C2	B	
K2	Xl	CR2	CATH	
K2	Xl	K1	Xl	
K2	Xl	K3	Xl	
K2	Xl	K4	Xl	
K2	C2	C2	A	
K2	X2	CR2	ANOD	
K2	X2	XA2	03	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
K3	Al	K4	A3	
*K3	Al	R3	A	
K3	A2	J1	G	Fire
K3	A2	J4	M	
K3	A3	NC		
K3	B1	K4	B3	
K3	B1	R3	B	
K3	B2	J1	F	Fire Rtn
K3	B2	J4	N	
K3	B3	NC		
K3	Cl	K2	Cl	
K3	C2	XA2	33	
K3	C3	NC		
K3	Xl	C3	B	
K3	Xl	CR3	CATH	
K3	Xl	K2	X01	
K3	Xl	XAl	15	
K3	X2	C3	A	
K3	X2	CR3	ANOD	
K3	X2	XAl	31	
K4	Al	K4	c l	
K4	A2	XAl	35	
K4	A3	K3	Al	
**K4	A3	R3	A	
K4	B1	K4	D1	
K4	B2	XAl	33	
K4	B3	K3	B1	
K4	Cl	K4	Al	
K4	Cl	K4	El	
K4	C2	XA2	18	

*Applicable to serial numbers 200,301 thru 200, 349.
**Applicable to serial number 200,350 and up.

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
K4	C3	K2	Al	
K4	D1	K4	B1	
K4	D1	K4	F1	
K4	D2	XA2	16	
K4	D3	K2	B1	
K4	El	K4	Cl	
K4	El	R8	B	
K4	E2	XAl	5	
K4	E3	K1	Al	
K4	F1	K4	D1	
K4	F2	XAl	3	
K4	F3	K1	B1	
K4	Xl	C4	B	
K4	Xl	CR4	CATH	
K4	Xl	K2	Xl	
K4	Xl	R8	A	
K4	X2	C4	A	
K4	C3	R2	A	
K4	D3	R2	B	
K4	F1	TB2	3	
K4	X2	CR4	ANOD	
K4	X2	XA8	8	
K4	SHLD	TB2	3	Ground, TSEM
MT1	A	XA8	30	
MT1	D	XA9	7	Ground, TSEM
MT1	E	XA8	24	
MTT	F	XA8	26	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
P3	A	All	H2	
P3	B	All	E2	
P3	C	All	H4	
P3	D	Al1	E4	
P3	E	All	E5	
P3	F	All	E8	
P3	G	All	H1O	
P3	H	All	H5	
P3	J	All	H7	
P3	K	All	E7	
P3	L	All	H8	
P3	M	All	E10	
P3	N	S2	BC	
P3	P	SlA	5	
P3	R	S1B	1	
P3	s	S1B	7	
P3	T	S1A	6	
P3	U	SIA	7	
P3	V	S1C	2	
P3	W	SlC	6	
P3	X	SlC	C	
P3	Y	S2	AC	
P3	z	S2	B2	
P3	a	S2	Al	
P3	b	S2	A2	Ground, TSEM
P3	b	All	K1	
P3	c	DS1	A	
P3	d	SlD	C	
P3	e	SlD	1	
P3	f	CB1	4	

Table 3-4. TSBM Wire List - Continued

From		To		Signal Name
P3	g	CB1	2	
P3	j	NC		
P3	i	NC		
P3	j	NC		
P3	k	NC		
P3	m	SIB	C	
P3	n	NC		
P3	p	NC		
P3	q	NC		
P3	r	NC		
P4	A	P4	SHLD	Ground, TSEM
P4	B	A2J1	2	Prefire Rtn
P4	c	A2Jl	3	Prefire
P4	D	A2J1	4	Missle Present
P4	G	A2J1	7	Yaw Bal B
P4	H	A2Jl	9	Pitch Bal B
P4	J	A2Jl	8	Yaw Bal A
P4	K	A2Jl	10	Pitch M A
P4	L	A2Jl	11	Airframe Gnd
P4	M	A2Jl	12	Fire
P4	N	A2Jl	13	Fire Rtn
P4	P	A2J1	14	Wiresig B
P4	S	A2J1	16	Wirecut Rtn
P4	T	A2Jl	17	Wire Cut
P4	V	A2J1	19	Wire Sig A
P4	SHLD	P4	A	Ground, TSEM
PS1	1	J2	g	
PSl	2	J2	f	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
PS1	3	TB3	6	
PS1	4	XA1	7	Ground, TSEM
PS1	5	TB4	2	
R1	A	K1	A1	
R1	B	K1	B1	
R2	A	K4	C3	
R2	B	K4	D3	
**R3	A	K4	A3	
*R3	A	K3	A1	
R3	B	K3	B1	
R5	A	TB4	6	
R5	B	TB3	6	
R6	A	TB3	2	
R6	B	TB4	2	
R7	A	TB2	6	
R7	B	TB1	6	
R8	A	K4	X1	
R8	B	K4	E1	
S1A	C	A11	K1	
S1A	C	S2	B1	
S1A	1	NC		
S1A	2	NC		
S1A	3	NC		
S1A	4	A11	B9	
S1A	5	P3	P	
S1A	6	P3	T	
S1A	7	P3	U	

*Applicable to serial number 200, 301 thru 200349.
**Appflcable to serial number 200, 350 and up.

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
S1B	C	P3	m	
S1B	1	P3	R	
S1B	2	NC		
S1B	3	S1B	4	
S1B	4	S1B	3	
S1B	4	S1B	5	
S1B	5	S1B	4	
S1B	5	S1B	6	
S1B	6	S1B	5	
S1B	6	S1B	7	
S1B	7	P3	S	
S1B	7	S1B	6	
SlC	C	P3	x	
SlC	C	DS13	A	+18V
SlC	1	NC		
SlC	2	P3	V	
SlC	3	SlC	4	
SlC	4	SlC	3	
SlC	4	SlC	5	
SlC	5	SlC	4	
SlC	5	SlC	6	
SlC	6	P3	W	
SlC	6	SlC	5	
SIC	6	SlC	7	
SlC	7	SlC	6	
S1D	C	P3	d	
SlD	1	P3	e	
S1D	1	S1D	2	
SlD	2	SlD	1	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
SlD	2	S1D	3	
S1D	3	S1D	2	
SlD	3	S1D	4	
SlD	4	SlD	3	
S1D	4	S1D	5	
S1D	5	S1D	4	
S1D	5	S1D	6	
S1D	6	SlD	5	
S2	AC	P3	Y	
S2	BC	P3	N	
S2	BC	C6	A	
S2	B1	C6	B	
S2	A1	P3	a	
S2	A2	P3	b	Ground, TSEM
S2	A2	S2	B1	
S2	B1	S1A	C	
S2	B1	S2	A2	
S2	B2	P3	Z	
TB1	1	NC		
TB1	2	NC		
TB1	3	NC		
TB1	4	NC		
TB1	5	NC		
TB1	6	J3	X	
TB1	6	R7	B	
TB1	6	XA9	15	
TB1	7	NC		
TB1	8	TB2	4	
TB1	8	VR3	AD	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
TB2	1	J3	b	
TB2	1	TB2	2	
TB2	1	XA9	7	Ground, TSEM
TB2	2	J4	SHLD	Ground, TSEM
TB2	2	TB2	1	
TB2	2	TB2	3	
TB2	3	K4	SHLD	Ground, TSEM
TB2	3	TB2	2	
TB2	3	TB2	4	
TB2	3	K4	F1	
TB2	4	J1	SHLD	Ground, TSEM
TB2	4	TB1	8	
TB2	4	TB2	3	
TB2	5	NC		
TB2	6	J3	a	
TB2	6	R7	A	
TB2	6	TB2	8	
TB2	7	NC		
TB2	8	TB2	6	
TB2	8	VR3	CATH	
TB3	1	NC		
TB3	2	K1	C1	-13V
TB3	2	R06	A	
TB3	2	TB3	4	
TB3	3	NC		
TB3	4	TB3	2	
TB3	4	VR2	ANOD	
TB3	4	XA1	2	
TB3	5	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
TB3	6	J1	m	TP18, Reg Vltg +18V
TB3	6	PSl	3	
TB3	6	R5	B	
TB3	6	XA9	15	
TB3	7	NC		
TB3	8	TB4	4	
TB3	8	VR1	ANOD	
TB4	1	NC		
TB4	2	PSl	5	
TB4	2	R6	B	
TB4	2	XA9	1	
TB4	3	NC		
TB4	4	TB3	3	
TB4	4	VR2	CATH	
TB4	4	XAl	7	Ground, TSEM
TB4	5	NC		
TB4	6	R5	A	
TB4	6	TB4	8	
TB4	6	XA9	14	+13V
TB4	7	NC		
TB4	8	TB4	6	
TB4	8	VR1	CATH	
VR1	ANOD	TB3	8	
VR1	CATH	TB4	3	
VR2	ANOD	TB3	4	
VR2	CATH	TB4	4	
VR3	ANOD	TB1	8	
VR3	CATH	TB2	8	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XAl	1	XA2	1	
XAl	2	XA2	2	
XA1	3	K4	F2	
XA1	4	J1	C	TP22, Prefire Mon
XA1	5	K4	E2	
XA1	6	J3	B	
XA1	7	PS1	4	Ground, TSEM
XA1	7	TB4	4	Ground, TSEM
XA1	7	XA2	7	Ground, TSEM
XA1	8	J1	q	TP21, Time Int-T02
XA1	8	XA3	31	
XA1	9	J1	d	TP24, Start Mon
XA1	10	J1	g	TP14, Rly Prefire Sig
XA1	10	K1	X2	
XA1	11	NC		
XA1	12	NC		
XA1	13	NC		
XA1	14	XA2	14	
XA1	15	K3	Xl	
XA1	15	XA2	15	
XA1	16	NC		
XA1	17	NC		
XA1	18	NC		
XA1	19	XA3	4	
XA1	20	J3	A	
XA1	21	J3	E	
XA1	22	XA2	8	
XA1	23	NC		
XA1	24	J3	V	
XA1	25	NC		

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
XA1	26	J3	W	
XA1	27	J3	S	
XA1	28	J1	L	MSL Pres
XA1	28	J3	R	
XA1	28	J4	D	
XA1	29	NC		
XA1	30	J1	D	TP23, Fire Ind Mon
XA1	31	J1	h	TP15, Fire Sig Rly
XA1	31	K3	X2	
XA1	32	J3	C	
XA1	33	K4	B2	
XA1	34	J1	f	TP13, Time Intvl -T04
XA1	34	XA3	35	
XA1	35	K4	A2	
XA2	1	XA1	1	
XA2	1	XA3	1	
XA1	2	TB3	4	
XA2	2	XA1	2	
XA2	2	XA3	2	
XA2	3	J1	j	TP16, Wire Cut Sig Rly
XA2	3	K2	X2	
XA2	4	NC		
XA2	5	J1	S	TP25, Wire Cut Mon
XA2	6	J3	D	
XA2	7	C5	B	Ground, TSEM
XA2	7	XA1	7	Ground, TSEM
XA2	7	XA3	7	Ground, TSEM
XA2	8	C5	A	
XA2	8	J3	N	

Table 3-4. TSEM Wire List-Continued

From		To		Signal Name
XA2	8	XAl	22	
XA2	8	XA4	18	
XA2	9	NC		
XA2	10	NC		
XA2	11	NC		
XA2	12	NC		
XA2	13	NC		
XAl	14	XAl	14	
XA2	14	XA3	14	
XA2	15	XAl	15	
XA2	15	XA3	15	
XA2	16	K4	D2	
XA2	17	NC		
XA2	18	K4	C2	
XA2	19	NC		
XA2	20	NC		
XA2	21	NC		
XA2	22	NC		
XA2	23	NC		
XA2	24	NC		
XA2	25	NC		
XA2	26	J3	H	
XA2	27	NC		
XA2	28	NC		
XA2	29	NC		
XA2	30	NC		
XA2	31	NC		
XA2	32	NC		
XA2	33	K3	C2	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA2	34	K2	C2	
XA2	35	K1	C2	
XA3	1	XA2	1	
XA3	1	XA4	1	
XA3	2	XA2	2	
XA3	2	XA4	2	
XA3	3	J1	c	TP10, Inp Bal Line Sig
XA3	4	XA1	19	
XA3	5	J3	Y	
XA3	6	XA4	10	TP7, Time Intvl -T02
XA3	7	XA2	7	Ground, TSEM
XA3	7	XA4	7	Ground, TSEM
XA3	8	NC		
XA3	9	NC		
XA3	10	NC		
XA3	11	NC		
XA3	12	J1	e	TP12, Int-T0l+T02+-T03
XA3	13	NC		
XA3	14	XA2	14	
XA3	14	XA4	14	
XA3	15	XA2	15	
XA3	15	XA4	15	
XA3	16	NC		
XA3	17	NC		
XA3	18	NC		
XA3	19	NC		
XA3	20	NC		
XA3	21	NC		
XA3	22	XA9	6	
XA3	23	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA3	24	NC		
XA3	25	NC		
XA3	26	J01	a	TP8, Time Intvl-T03
XA3	26	XA4	20	
XA3	27	NC		
XA3	28	NC		
XA3	29	NC		
XA3	30	NC		
XA3	31	XAl	8	
XA3	31	XA5	22	
XA3	32	J1	K	TP1l, P & Yaw Bal A
XA3	32	J3	e	
XA3	33	NC		
XA3	34	J1	J	Rtn P & Yaw Bal B
XA3	34	J4	G	
XA3	35	XAl	34	
XA4	1	XA3	1	
XA4	1	XA5	1	
XA4	2	XA3	2	
XA4	2	XA5	2	
XA4	3	NC		
XA4	4	J3	F	
XA4	5	NC		
XA4	6	NC		
XA4	7	XA3	7	Ground, TSEM
XA4	7	XA5	7	Ground, TSEM
XA4	8	NC		
XA4	9	J1	V	TP3, P Discr output
XA4	9	XA5	18	

Table 3-4. TSEM Wire List -Continued

From		To		Signal Name
XA4	10	J1	z	TP7, Time Intvl-T02
XA4	10	XA3	6	
XA4	11	NC		
XA4	12	NC		
XA4	13	NC		
XA4	14	XA3	14	
XA4	14	XA5	14	
XA4	15	XA3	15	
XA4	15	XA5	15	
XA4	16	NC		
XA4	17	NC		
XA4	18	XA2	8	
XA4	18	XA7	4	
XA4	19	NC		
XA4	20	XA3	26	
XA4	21	NC		
XA4	22	NC		
XA4	23	NC		
XA4	24	NC		
XA4	25	NC		
XA4	26	NC		
XA4	27	NC		
XA4	28	NC		
XA4	29	NC		
XA4	30	J3	G	
XA4	31	NC		
XA4	32	NC		
XA4	33	NC		
X44	34	J1	Y	TP6, Yaw Discr output
XA4	34	XA6	3	
XA4	35	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA5	1	XA4	1	
XA5	1	XA6	1	
XA5	2	XA4	2	
XA5	2	XA6	2	
XA5	3	XA9	17	
XA5	4	J1	A	Wire Signal A
KA5	4	J4	V	
XA5	5	J1	B	Wire Signal B
XA5	5	J4	P	
XA5	6	XA5	30	
XA5	6	XA9	35	
XA5	7	XA4	7	Ground, TSEM
XA5	7	XA6	7	Ground, TSEM
XA5	8	XA8	3	
XA5	9	NC		
XA5	10	J1	U	TP2, Inp P PH LK LP
XA5	11	NC		
XA5	12	XA7	18	
XA5	13	NC		
XA5	14	XA4	14	
XA5	14	XA6	14	
XA5	15	XA4	15	
XA5	15	XA6	15	
XA5	16	NC		
XA5	17	NC		
XA5	18	XA4	9	
XA5	19	NC		
XA5	20	NC		
XA5	21	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA5	22	XA3	31	
XA5	23	NC		
XA5	24	NC		
XA5	25	NC		
XA5	26	NC		
XA5	27	NC		
XA5	28	NC		
XA5	29	NC		
XA5	30	XA5	6	
XA5	31	NC		
XA5	32	NC		
XA5	33	NC		
XA5	34	J1	T	TP1 , Pitch VCO
XA5	35	NC		
XA6	1	XA5	1	
XA6	1	XA7	1	
XA6	2	XA5	2	
XA6	2	XA7	2	
XA6	3	XA4	34	
XA6	4	NC		
XA6	5	NC		
XA6	6	NC		
XA6	7	XA5		Ground, TSEM
XA6	7	XA7		Ground, TSEM
XA6	8	NC		
XA6	9	NC		
XA6	10	NC		
XA6	11	NC		
XA6	12	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA6	13	NC		
XA6	14	XA5	14	
XA6	14	XA7	14	
XA6	15	XA5	15	
XA6	15	XA7	15	
XA6	16	NC		
XA6	17	NC		
XA6	18	NC		
XA6	19	XA7	18	
XA6	20	NC		
XA6	21	NC		
XA6	22	NC		
XA6	23	J1	W	TP4, Inp Yaw PH LK LP
XA6	24	NC		
XA6	25	NC		
XA6	26	NC		
XA6	27	NC		
XA6	28	NC		
XA6	29	NC		
XA6	30	NC		
XA6	31	NC		
XA6	32	NC		
XA6	33	NC		
XA6	34	J1	X	TP5, Yaw Vco
XA6	34	NC		
XA7	1	XA6	1	
XA7	1	XA8	1	
XA7	2	XA6	2	
XA7	2	XA8	2	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA7	3	NC		
XA7	4	XA4	18	
XA7	5	NC		
XA7	6	J3	L	
XA7	7	XA5	7	Ground, TSEM
XA7	7	XA8	7	Ground, TSEM
XA7	8	NC		
XA7	9	NC		
XA7	10	NC		
XA7	11	NC		
XA7	12	NC		
XA7	13	NC		
XA7	14	XA5	14	
XA7	14	XA8	14	
XA7	15	XA6	15	
XA7	15	XA8	15	
XA7	16	NC		
XA7	17	J3	K	
XA7	18	XA5	12	
XA7	18	XA6	19	
XA7	19	NC		
XA7	20	NC		
XA7	21	J3		
XA7	22	NC		
XA7	23	NC		
XA7	24	NC		
XA7	25	NC		
XA7	26	NC		
XA7	27	J1		TP9, Wire Sig DC Lvl
XA7	28	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA7	29	NC		
XA7	30	NC		
XA7	31	NC		
XA7	32	NC		
XA7	33	NC		
XA7	24	NC		
XA7	35	NC		
XA8	1	XA7	1	
XA8	1	XA9	1	
XA8	2	XA7	2	
XA8	2	XA9	2	
XA8	3	XA5	8	
XA8	3	XA9	8	
XA8	4	NC		
XA8	5	NC		
XA8	6	NC		
XA8	7	XA7	7	Ground, TSEM
XA8	7	XA9	7	Ground, TSEM
XA8	8	K4	X2	
XA8	9	NC		
XA8	10	J3	P	
XA8	11	NC		
XA8	l2	J3	T	
XA8	13	NC		
XA8	14	XA7	14	
XA8	14	XA9	14	
XA8	15	XA7	15	
XA8	15	XA9	15	

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA8	16	NC		
XA8	17	NC		
XA8	18	NC		
XA8	19	NC		
XA8	20	NC		
XA8	21	NC		
XA8	22	NC		
XA8	23	NC		
XA8	24	MT1	E	
XA8	25	NC		
XA8	26	MT1	F	
XA8	27	NC		
XA8	28	J1	r	Shear Pin
XA8	29	NC		
XA8	30	MTl	A	
XA8	31	NC		
XA8	32	J3	M	
XA8	33	NC		
XA8	34	NC		
XA8	35	NC		
XA9	1	J1	n	TP19, Reg Vltg -18V
XA9	1	J3	c	-18V
XA9	1	TB4	2	
XA9	1	XA8	1	
XA9	2	J1	p	TP20, Reg Vltg -13V
XA9	2	XA8	2	
XA9	3	NC		
XA9	4	NC		
XA9	5	NC		

Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA9	6	XA3	22	
XA9	7	J1	1	Ground, TSEM
XA9	7	MT1	D	Ground, TSEM
XA9	7	TB2	1	Ground, TSEM
XA9	7	XA8	7	Ground, TSEM
XA9	8	J3	U	
XA9	8	XA8	3	
XA9	9	NC		
XA9	10	NC		
XA9	11	NC		
XA9	13	NC		
XA9	13	NC		
XA9	14	J1	k	TP17, Reg Vltg +13V
XA9	14	J3	z	
XA9	14	TB4	6	+13V
XA9	14	XA8	14	
XA9	15	TB1	6	
XA9	15	TB3	6	
XA9	15	XA8	15	
XA9	16	NC		
XA9	17	XA5	3	
XA9	18	NC		
XA9	19	NC		
XA9	20	NC		
XA9	21	NC		
XA9	22	NC		
XA9	23	NC		
XA9	24	NC		
xA9	25	NC		
XA9	26	NC		

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Table 3-4. TSEM Wire List - Continued

From		To		Signal Name
XA9	27	NC		
XA9	28	NC		
XA9	29	NC		
XA9	30	NC		
XA9	31	NC		
XA9	32	NC		
XA9	35	XA5	6	

3-6. TSGMS Cable Interconnections.

CAUTION

Exercise care when connecting and disconnecting cables to prevent damage to equipment due to electrostatic discharge and erroneous connections. Prior to connecting or disconnecting LRU cables, be sure all power is turned off and that sources of electrostatic charge are not present at either end of the cables. Since the majority of the pins on each LRU cable lead to components which are ESD, personnel must not touch, or otherwise allow static charges to reach the exposed pins of connector cables. A protective cap must be installed on any connector when cable is disconnected.

Following is a cross reference table (table 3-5) of each system cable assembly, pin number, and signal nomenclature.

Table 3-5. TSGMS Cable Interconnection

From		To		Signal Name
W1XP1	A	W1XJ237	A	+28 V
W1XP1	A	W1XP237	A	+28 V
W1XP1	B	W1XJ237	B	28 V rtn
W1XP1	B	W1XP237	B	28 V rtn
W1XP1	C	W1XJ237	C	Chassis ground
W1XP1	C	W1XP237	C	Chassis ground
W1XJ237	A	W1XP1	A	+28 V
W1XJ237	A	W1XP237	A	+28 V
W1XJ237	B	W1XP1	B	28 V rtn
W1XJ237	B	W1XP237	B	28 V rtn
W1XJ237	C	W1XP1	C	Chassis ground
W1XJ237	C	W1XP237	C	Chassis ground
W1XP237	A	W1P1	A	+28 V
W1XP237	A	W1XJ237	A	+28 V
W1XP237	B	W1P1	B	28 V rtn
W1XP237	B	W1XJ237	B	28 V rtn
W1XP237	C	W1P1	C	Chassis ground
W1XP237	C	W1XJ237	C	Chassis ground
W2XP1	A	W2XP2	A	Target power
W2XP1	B	W2XP2	B	Target power
W2XP1	C	W2XP2	C	28 V rtn
W2XP1	D	W2XP2	D	28 V rtn
W2XP1	E	W2XP2	E	Rtn
W2XP1	F	W2XP2	F	
W2XP1	G	W2XP2	G	Center target
W2XP1	H	W2XP2	H	Left target

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W2XP1	J	W2XP2	J	Right target
W2XP1	K	W2XP2	K	Up target
W2XP1	L	W2XP2	L	Down target
W2XP1	M	W2XP2	M	
W2XP1	N	W2XP2	N	
W2XP1	P	W2XP2	P	
W2XP1	R	W2XP2	R	
W2XP1	S	W2XP2	S	Target amplitude
W2XP1	T	W2XP2	T	Manual rtn
W2XP1	U	W2XP2	U	Log H
W2XP1	V	W2XP2	V	Log H rtn
W2XP2	A	W2XP1	A	Target power
W2XP2	B	W2XP1	B	Target power
W2XP2	C	W2XP1	C	28 V rtn
W2XP2	D	W2XP1	D	28 V rtn
W2XP2	E	W2XP1	E	Rtn
W2XP2	F	W2XP1	F	
W2XP2	G	W2XP1	G	Center target
W2XP2	H	W2XP1	H	Left target
W2XP2	J	W2XP1	J	Right target
W2XP2	K	W2XP1	K	Up target
W2XP2	L	W2XP1	L	Down target
W2XP2	M	W2XP1	M	
W2XP2	N	W2XP1	N	
W2XP2	P	W2XP1	P	
W2XP2	R	W2XP1	R	
W2XP2	S	W2XP1	S	Target amplitude
W2XP2	T	W2XP1	T	Manual rtn
W2XP2	U	W2XP1	U	Log H
W2XP2	V	W2XP1	V	Log H rtn

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W3XP3	A	W3X2P05	A	
W3XP3	B	W3X2P05	B	11.8 sin
W3XP3	C	W3X2P05	C	σ_{z1}
W3XP3	D	W3X2P05	D	σ_{z2}
W3XP3	E	W3X2P05	E	Shields
W3XP3	F	W3X2P05	F	Cos Ø reference
W3XP3	G	W3X2P05	G	Motion compensation switch
W3XP3	H	W3X2P05	H	El track stick command
W3XP3	J	W3X2P05	J	Az track stick command
W3XP3	K	W3X2P05	K	Manual
W3XP3	L	W3X2P05	L	Az manual control
W3XP3	M	W3X2P05	M	El manual control
W3XP3	N	W3X2P05	N	BIT comp No. 1
W3XP3	P	W3X2P05	P	BIT comp No. 2
W3XP3	R	W3X2P05	R	BIT comp No. 3
W3XP3	S	W3X2P05	S	BIT comp No. 4
W3XP3	T	W3X2P05	T	El torque buffered
W3XP3	U	W3X2P05	U	Az torque buffered
W3XP3	V	W3X2P05	V	El track stick command 100°/S
W3XP3	W	W3X2P05	W	Az track stick command 100°/S
W3XP3	X	W3X2P05	X	Denotation servo rate
W3XP3	Y	W3X2P05	Y	Window servo rate
W3XP3	Z	W3X2P05	Z	Az out
W3XP3	a	W3X2P05	a	Az in
W3XP3	b	W3X2P05	b	Az error
W3XP3	c	W3X2P05	c	El out
W3XP3	d	W3X2P05	d	El in
W3XP3	e	W3X2P05	e	El error
W3XP3	f	W3X2P05	f	ρ servo error

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W3XP3	g	W3X2P05	g	ρ servo rate
W3XP3	h	W3X2P05	h	Clutch engage command
W3XP3	i	W3X2P05	i	SCA test pass
W3XP3	j	W3X2P05	j	El acquisition command
W3XP3	k	W3X2P05	k	Az acquisition command
W3XP3	m	W3X2P05	m	28 V rtn
W3XP3	n	W3X2P05	n	Derotation servo error
W3XP3	p	W3X2P05	p	
W3XP3	q	W3X2P05	q	El gimbal angle
W3XP3	r	W3X2P05	r	SCA rtn
W3XP3	s	W3X2P05	s	Az gimbal angle
W3XP3	t	W3X2P05	t	El motion compensation
W3XP3	u	W3X2P05	u	Az motion compensation
W3XP3	v	W3X2P05	v	El torque current
W3XP3	w	W3X2P05	w	Az torque current
W3XP3	x	W3X2P05	x	Yaw error
W3XP3	y	W3X2P05	y	Gyro alignment
W3XP3	z	W3X2P05	z	Pitch error
W3XP3	AA	W3X2P05	AA	11.8 cos
W3XP3	BB	W3X2P05	BB	Yaw LOS rate
W3XP3	CC	W3X2P05	CC	Pitch LOS rate
W3XP3	DD	W3X2P05	DD	Yaw OLC
W3XP3	EE	W3X2P05	EE	TSU rtn
W3XP3	FF	W3X2P05	FF	Airspeed
W3XP3	GG	W3X2P05	GG	Launch constraint
W3XP3	HH	W3X2P05	HH	11.8 sin ϕ
W3XP3	JJ	W3X2P05	JJ	10 sin σ_Z
W3XP3	KK	W3X2P05	KK	Az track command 100 mr/s
W3XP3	LL	W3X2P05	LL	El track command 100 mr/s

Table 3-5. TSGMS Cable Interconnection -Continued

From		To		Signal Name
W3XP3	MM	W3X2P05	MM	Window servo error
W3XP3	NN	W3X2P05	NN	11.8 cos ρ
W3XP3	PP	W3X2P05	PP	11.8 sin ϕ
W3X2P05	A	W3XP3	A	
W3X2P05	B	W3XP3	B	11.8 sin
W3X2P05	C	W3XP3	C	σ_{z1}
W3X2P05	D	W3XP3	D	σ_{z2}
W3X2P05	E	W3XP3	E	Shields
W3X2P05	F	W3XP3	F	Cos θ reference
W3X2P05	G	W3XP3	G	Motion compensation switch
W3X2P05	H	W3XP3	H	El track stick command
W3X2P05	J	W3XP3	J	Az track stick command
W3X2P05	K	W3XP3	K	Manual
W3X2P05	L	W3XP3	L	Az manual control
W3X2P05	M	W3XP3	M	El manual control
W3X2P05	N	W3XP3	N	BIT comp No. 1
W3X2P05	P	W3XP3	P	BIT comp No. 2
W3X2P05	R	W3XP3	R	BIT comp No. 3
W3X2P05	S	W3XP3	S	BIT comp No. 4
W3X2P05	T	W3XP3	T	El torque buffered
W3X2P05	U	W3XP3	U	Az torque buffered
W3X2P05	V	W3XP3	V	E1 track stick command 100°/S
W3X2P05	W	W3XP3	W	Az track stick command 100°/S
W3X2P05	X	W3XP3	X	Denotation servo rate
W3X2P05	Y	W3XP3	Y	Window servo rate
W3X2P05	Z	W3XP3	Z	Az out
W3X2P05	a	W3XP3	a	Az in
W3X2P05	b	W3XP3	b	Az error
W3X2P05	c	W3XP3	c	El out

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W3X2P05	d	W3XP3	d	El in
W3X2P05	e	W3XP3	e	El error
W3X2P05	f	W3XP3	f	ρ servo error
W3X2P05	g	W3XP3	g	ρ servo rate
W3X2P05	h	W3XP3	h	Clutch engage command
W3X2P05	i	W3XP3	i	SCA test pass
W3X2P05	j	W3XP3	j	El acquisition command
W3X2P05	k	W3XP3	k	Az acquisition command
W3X2P05	m	W3XP3	m	28 V rtn
W3X2P05	n	W3XP3	n	Denotation servo error
W3X2P05	p	W3XP3	p	
W3X2P05	q	W3XP3	q	El gimbal angle
W3X2P05	r	W3XP3	r	SCA rtn
W3X2P05	s	W3XP3	s	Az gimbal angle
W3X2P05	t	W3XP3	t	El motion compensation
W3X2P05	u	W3XP3	u	Az motion compensation
W3X2P05	v	W3XP3	v	El torque current
W3X2P05	w	W3XP3	w	Az torque current
W3X2P05	x	W3XP3	x	Yaw error
W3X2P05	γ	W3XP3	γ	Gyro alignment
W3X2P05	z	W3XP3	z	Pitch error
W3X2P05	AA	W3XP3	AA	11.8 cos
W3X2P05	BB	W3XP3	BB	Yaw LOS rate
W3X2P05	CC	W3XP3	CC	Pitch LOS rate
W3X2P05	DD	W3XP3	DD	Yaw OLC
W3X2P05	EE	W3XP3	EE	TSU rtn
W3X2P05	FF	W3XP3	FF	Airspeed
W3X2P05	GG	W3XP3	GG	Launch constraint
W3X2P05	HH	W3XP3	HH	11.8 sin ϕ

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W3X2P05	J J	W3XP3	J J	**10 sin σ_z**
W3X2P05	KK	W3XP3	KK	Az track command 100 mr/s
W3X2P05	LL	W3XP3	LL	El track command 100 mr/s
W3X2P05	MM	W3XP3	MM	Window servo error
W3X2P05	NN	W3XP3	NN	**11.8 cos ρ**
W3X2P05	P P	W3XP3	P P	**11.8 sin ϕ**
W4XP4	A	W4XP332	A	
W4XP4	B	W4XP332	B	
W4XP4	C	W4XP332	C	
W4XP4	D	W4XP332	D	**10 cos η_G**
W4XP4	E	W4XP332	E	Shields
W4XP4	F	W4XP332	F	Az ref
W4XP4	G	W4XP332	G	El sample pulse
W4XP4	H	W4XP332	H	Az sample pulse
W4XP4	J	W4XP332	J	El VS1
W4XP4	K	W4XP332	K	ϵ_g return
W4XP4	L	W4XP332	L	**10 cos ϵ_G**
W4XP4	M	W4XP332	M	**10 sin ϵ_G**
W4XP4	N	W4XP332	N	+15 v
W4XP4	P	W4XP332	P	Az band pass
W4XP4	R	W4XP332	R	TSU rtn
W4XP4	S	W4XP332	S	El reference
W4XP4	T	W4XP332	T	El band pass
W4XP4	U	W4XP332	U	-15 v
W4XP4	V	W4XP332	V	Az VSl
W4XP4	W	W4XP332	W	10 V, 400 Hz, ph (A + 90)
W4XP4	X	W4XP332	X	Airspeed rtn
W4XP4	Y	W4XP332	Y	BIT 3
W4XP4	Z	W4XP332	Z	BIT 5

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W4XP4	a	W4XP332	a	BIT 6
W4XP4	b	W4XP332	b	Direction cos i_G
W4XP4	c	W4XP332	c	Direction cos i_G rtn
W4XP4	d	W4XP332	d	Direction cos j_G
W4XP4	e	W4XP332	e	Direction cos j_G rtn
W4XP4	f	W4XP332	f	Direction cos k_G
W4XP4	g	W4XP332	g	Direction k_G rtn
W4XP4	h	W4XP332	h	Gun line i_t
W4XP4	i	W4XP332	i	Gun line i_t rtn
W4XP4	j	W4XP332	j	Gun line j_t
W4XP4	k	W4XP332	k	Gun line j_t rtn
W4XP4	m	W4XP332	m	Gun line k_t
W4XP4	n	W4XP332	n	Gun line k_t rtn
W4XP4	p	W4XP332	p	Az gun command
W4XP4	q	W4XP332	q	Az gun command rtn
W4XP4	r	W4XP332	r	El gun command
W4XP4	s	W4XP332	s	El gun command rtn
W4XP4	t	W4XP332	t	Cos ϵ_g
W4XP4	u	W4XP332	u	Sin ϵ_g
W4XP4	v	W4XP332	v	Az acquisition command
W4XP4	w	W4XP332	w	El acquisition command
W4XP4	x	W4XP332	x	Az acquisition command rtn
W4XP4	y	W4XP332	y	El acquisition command rtn
W4XP4	z	W4XP332	z	K_1 (t) BIT pass
W4XP4	AA	W4XP332	AA	Squib Connect/Camera
W4XP4	BB	W4XP332	BB	
W4XP4	CC	W4XP332	CC	
W4XP4	DD	W4XP332	DD	
W4XP4	EE	W4XP332	EE	Track mode
W4XP4	FF	W4XP332	FF	Weapon select

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W4XP4	GG	W4XP332	GG	10 sin η_G
W4XP4	HH	W4XP332	HH	10 sin η_G rtn
W4XP4	J J	W4XP332	NC	
W4XP4	KK	W4XP332	NC	
W4XP4	LL	W4XP332	NC	
W4XP4	MM	W4XP332	MM	+28 V
W4XP4	NN	W4XP332	NN	Weapon action
W4XP4	P P	WXP332	P P	Pilot acquisition
W4XP332	A	W4XP4	A	
W4XP332	B	W4XP4	B	
W4XP332	C	W4XP4	c	
W4XP332	D	W4XP4	D	10 Cos η_G
W4XP332	E	W4XP4	E	Shields
W4XP332	F	W4XP4	F	Az ref
W4XP332	G	W4XP4	G	El sample pulse
W4XP332	H	W4XP4	H	Az sample pulse
W4XP332	J	W4XP4	J	El VS1
W4XP332	K	W4XP4	K	ϵ_g return
W4XP332	L	W4XP4	L	10 cos ϵ G
W4XP332	M	W4XP4	M	10 sin ϵ_G
W4XP332	N	W4XP4	N	+15 v
W4XP332	P	W4XP4	P	Az band pass
W4XP332	R	W4XP4	R	TSU rtn
W4XP332	S	W4XP4	s	El reference
W4XP332	T	W4XP4	T	El band pass
W4XP332	U	W4XP4	u	-15 V
W4XP332	V	W4XP4	v	Az VS1
W4XP332	W	W4XP4	w	10 V, 400 Hz, ph (A + 90)
W4XP332	X	W4XP4	x	Airspeed rtn

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W4XP332	Y	W4XP4	Y	BIT 3
W4XP332	Z	W4XP4	z	BIT 5
W4XP332	a	W4XP4	a	BIT 6
W4XP332	b	W4XP4	b	Direction cos i_G
W4XP332	c	W4XP4	c	Direction cos i_G rtn
W4XP332	d	W4XP4	d	Direction cos j_G
W4XP332	e	W4XP4	e	Direction cos j_G rtn
W4XP332	f	W4XP4	f	Direction cos k_G
W4XP332	g	W4XP4	g	Direction k_G rtn
W4XP332	h	W4XP4	h	Gun line i_t
W4XP332	i	W4XP4	i	Gun line i_t rtn
W4XP332	j	W4XP4	j	Gun line j_t
W4XP332	k	W4XP4	k	Gun line j_t rtn
W4XP332	m	W4XP4	m	Gun line k_t
W4XP332	n	W4XP4	n	Gun line k_t rtn
W4XP332	p	W4XP4	p	Az gun command
W4XP332	q	W4XP4	q	Az gun command rtn
W4XP332	r	W4XP4	r	El gun command
W4XP332	s	W4XP4	s	El gun command rtn
W4XP332	t	W4XP4	t	Cos ϵ_g
W4XP332	u	W4XP4	u	Sin ϵ_g
W4XP332	v	W4XP4	v	Az acquisition command
W4XP332	w	W4XP4	w	El acquisition command
W4XP332	x	W4XP4	x	Az acquisition command rtn
W4XP332	γ	W4XP4	γ	El acquisition command rtn
W4XP332	z	W4XP4	z	K_1 (t) BIT pass
W4XP332	AA	W4XP4	AA	Squib Connect Camera
W4XP332	BB	W4XP4	BB	
W4XP332	CC	W4XP4	CC	

Table 3-5. TSGMS Cable Interconnection -Continued

From		To		Signal Name
W4XP332	DD	W4XP4	DD	
W4XP332	EE	W4XP4	EE	Track mode
W4XP332	FF	W4XP4	FF	Weapon select
W4XP332	GG	W4XP4	GG	10 sin η_G
W4XP332	HH	W4XP4	HH	10 sin η_G rtn

◀ NOTE ▶

Pins JJ. KK. and LL are shorted together at W4XP332 connector but are not connected to W4XP4

W4XP332	JJ	W4XP4		
W4XP332	KK	W4XP4		
W4XP332	LL	W4XP4		
W4XP332	MM	W4XP4	MM	+28 V
W4XP332	NN	W4XP4	NN	Weapon action
W4XP332	PP	W4XP4	PP	Pilot acquisition
W5XP5	A	W5XP330	A	
W5XP5	B	W5XP330	B	Program interrupt
W5XP5	C	W5XP330	C	Timer start
W5XP5	D	W5XP330	D	T6, t = 0
W5XP5	E	W5XP330	E	MCA rtn
W5XP5	F	W5XP330	F	T7, t = 0.17
W5XP5	G	W5XP330	G	
W5XP5	H	W5XP330	H	T11. t = 0.79
W5XP5	J	W5XP330	J	T13. t = l.35
W5XP5	K	W5XP330	K	T14. t = 2.34
W5XP5	L	W5XP330	L	T15. t = 4.32
W5XP5	M	W5XP330	M	
W5XP5	N	W5XP330	N	BIT 1
W5XP5	P	W5XP330	P	In test

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W5XP5	R	W5XP330	R	BIT 2
W5XP5	S	W5XP330	S	Pitch VCO disable
W5XP5	T	W5XP330	T	Yaw VCO disable
W5XP5	U	W5XP330	U	Pitch SB1
W5XP5	V	W5XP330	V	Yaw SB1
W5XP5	W	W5XP330	W	+28 V squib power
W5XP5	X	W5XP330	X	T17. t = 13.48
W5XP5	Y	W5XP330	Y	115 V. 400 Hz, ph A
W5XP5	Z	W5XP330	Z	115 V. 400 Hz, ph B
W5XP5	a	W5XP330	a	115 V. 400 Hz, ph C
W5XP5	b	W5XP330	b	Prefire fire, wirecut
W5XP5	c	W5XP330	c	Programmer sequence
W5XP5	d	W5XP330	d	BIT 4
W5XP5	e	W5XP330	e	MCA rtn
W5XP5	f	W5XP330	f	MCA BIT pass
W5XP5	g	W5XP330	g	Pitch output
W5XP5	n	W5XP330	h	Yaw output
W5XP5	i	W5XP330	i	Pitch limit and sum
W5XP5	j	W5XP330	j	Yaw limit and sum
W5XP5	k	W5XP330	k	CVAC
W5XP5	m	W5XP330	m	G bias sum amplifier
W5XP5	n	W5XP330	n	BIT 7
W5XP5	p	W5XP330	p	BIT 8
W5XP5	q	W5XP330	q	BIT 9
W5XP5	r	W5XP330	r	BIT 10
W5XP330	A	W5XP5	A	
W5XP330	B	W5XP5	B	Program interrupt
W5XP330	C	W5XP5	C	Timer start
W5XP330	D	W5XP5	D	T6. t = 0

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W5XP330	E	W5XP5	E	MCA rtn
W5XP330	F	W5XP5	F	T7, t = 0.l7
W5XP330	G	W5XP5	G	
W5XP330	H	W5XP5	H	Tll, t = 0.79
W5XP330	J	W5XP5	J	T13, t = 1.35
W5XP330	K	W5XP5	K	T14, t = 2.34
W5XP330	L	W5XP5	L	T15, t = 4.32
W5XP330	M	W5XP5	M	
W5XP330	N	W5XP5	N	BIT 1
W5XP330	P	W5XP5	P	In test
W5XP330	R	W5XP5	R	BIT 2
W5XP330	S	W5XP5	S	Pitch VCO disable
W5XP330	T	WSXP5	T	Yaw VCO disable
W5XP330	U	W5XP5	U	Pitch SB1
W5XP330	V	W5XP5	V	Yaw SB1
W5XP330	W	W5XP5	W	+ 28 V squib power
W5XP330	X	W5XP5	X	T17, t = 13.48
W5XP330	Y	W5XP5	Y	115 V, 400 Hz, ph A
W5XP330	Z	WSXP5	Z	115 V, 400 Hz, ph B
W5XP330	a	W5XP5	a	115 V, 400 Hz, ph C
W5XP330	b	W5XP5	b	Prefire/fire/wirecut
W5XP330	c	WSXP5	c	Programmer sequence
W5XP330	d	W5XP5	d	BIT 4
W5XP330	e	W5XP5	e	MCA rtn
W5XP330	f	W5XP5	f	MCA BIT pass
W5XP330	g	W5XP5	g	Pitch output
W5XP330	h	W5XP5	h	Yaw output
W5XP330	i	W5XP5	i	Pitch limit and sum
W5XP3S0	j	W5XP5	j	Yaw limit and sum

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W5XP330	k	W5XP5	k	CVAC
W5XP330	m	W5XP5	m	G bias sum amplifier
W5XP330	n	W5XP5	n	BIT 7
W5XP330	p	W5XP5	p	BIT 8
W5XP330	q	W5XP5	q	BIT 9
W5XP330	r	W5XP5	r	BIT 10
W6XP6	A	NC		
W6XP6	B	NC		
W6XP6	C	NC		
W6XP6	D	W6XJ327	MM	Gnd
W6XP6	D	W6XP327	MM	Gnd
W6XP6	E	W6XJ327	A	TOW trigger armed
W6XP6	E	W6XP327	A	TOW trigger armed
W6XP6	F	W6XJ327	B	Shield
W6XP6	F	W6XP327	B	Shield
W6XP6	G	W6XJ327	C	Stow SCA
W6XP6	G	W6XP327	C	Stow SCA
W6XP6	H	W6XJ327	D	Acquisition
W6XP6	H	W6XP327	D	Acquisition
W6XP6	J	W6XJ327	E	Airspeed
W6XP6	K	W6XJ327	F	Airspeed return
W6XP6	K	W6XP327	F	Airspeed return
W6XP6	L	W6XJ327	L	Port wire cmd A
W6XP6	L	W6XP327	L	Port wire cmd A
W6XP6	M	W6XJ327	M	Port wire cmd B
W6XP6	M	W6XP327	M	Port wire cmd B
W6XP6	N	W6XJ327	N	Wide -medium switch
W6XP6	N	W6XP327	N	Wide -medium switch
W6XP6	P	W6XJ327	Y	Medium -narrow switch

Table 3-5. TSGMS Cable Interconnection -Continued

From		To		Signal Name
W6XP6	P	W6XP327	Y	Medium-narrow switch
W6XP6	R	W6XJ327	d	Az trk stk cmd
W6XP6	S	W6XJ327	e	Az trk stk cmd return
W6XP6	T	W6XJ327	f	El trk stk cmd
W6XP6	U	W6XJ327	g	El trk stk cmd return
W6XP6	V	W6XJ327	w	Roll syn resol ph A
W6XP6	W	W6XJ327	x	Roll syn resol ph B
W6XP6	X	W6XJ327	y	Roll syn resol ph C
W6XP6	Y	W6XJ327	z	Pitch syn resol ph A
W6XP6	Z	W6XJ327	AA	Pitch syn resol ph B
W6XP6	a	W6XJ327	BB	Pitch syn resol ph C
W6XP6	b	W6XJ327	CC	Msh present/selector
W6XP6	b	W6XP327	CC	Msh present/selector
W6XP6	c	W6XJ327	DD	Weapon select SCA
W6XP6	c	W6XP327	DD	Weapon select SCA
W6XP6	d	W6XJ327	EE	Indicator test
W6XP6	d	W6XP327	EE	Indicator test
W6XP6	e	W6XJ327	NN	Remote on cmd
W6XP6	e	W6XP327	NN	Remote on cmd
W6XP6	f	W6XP327	E	Airspeed
W6XP6	g	NC		
W6XP6	h	W6XP327	d	Az trk stk cmd
W6XP6	i	W6XP327	e	Az trk stk cmd return
W6XP6	j	W6XP327	f	El trk stk cmd
W6XP6	k	W6XP327	g	El trk stk cmd return
W6XP6	m	W6XP327	x	Roll syn resol ph B
W6XP6	n	W6XP327	y	Roll syn resol ph C
W6XP6	p	W6XP327	z	Pitch syn resol ph A
W6XP6	q	W6XP327	AA	Pitch syn resol ph B

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XP6	r	W6XP327	BB	Pitch syn resol ph C
W6XP6	s	NC		
W6XJ327	A	W6XP6	E	TOW trigger armed
W6XJ327	A	W6XP327	A	TOW trigger armed
W6XJ327	B	W6XP6	F	Shield
W6XJ327	B	W6XP327	B	Shield
W6XJ327	C	W6XP6	G	Stow SCA
W6XJ327	C	W6XP327	C	Stow SCA
W6XJ327	D	W6XP6	H	Acquisition
W6XJ327	D	W6XP327	D	Acquisition
W6XJ327	E	W6XP6	J	Airspeed
W6XJ327	F	W6XP6	K	Airspeed return
W6XJ327	F	W6XP327	F	Airspeed return
W6XJ327	G	W6XP327	G	
W6XJ327	H	W6XP327	H	
W6XJ327	J	W6XP327	J	Window servo tach
W6XJ327	K	W6XP327	K	Window servo tach
W6XJ327	L	W6XP6	L	Port wire cmd A
W6XJ327	L	W6XP327	L	Port wire cmd A
W6XJ327	M	W6XP6	M	Port wire cmd B
W6XJ327	M	W6XP327	M	Port wire cmd B
W6XJ327	N	W6XP6	N	Wide -medium switch
W6XJ327	N	W6XP327	N	Wide -medium switch
W6XJ327	P	W6XP327	P	Medium -narrow switch
W6XJ327	R	W6XP327	R	
W6XJ327	S	W6XP327	S	
W6XJ327	T	W6XP327	T	
W6XJ327	U	W6XP327	U	
W6XJ327	V	W6XP327	V	

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XJ327	W	W6XP327	W	
W6XJ327	X	W6XP327	X	
W6XJ327	Y	W6XP6	P	Medium-narrow switch
W6XJ327	Y	W6XP327	Y	Medium-narrow switch
W6XJ327	Z	W6XP327	Z	
W6XJ327	a	W6XP327	a	
W6XJ327	b	W6XP327	b	
W6XJ327	c	W6XP327	c	
W6XJ327	d	W6XP6	R	Az trk stk cmd
W6XJ327	e	W6XP6	S	Az trk stk cmd return
W6XJ327	f	W6XP6	T	El trk stk cmd
W6XJ327	g	W6XP6	U	El trk stk cmd return
W6XJ327	h	W6XP327	h	
W6XJ327	i	W6XP327	i	
W6XJ327	j	W6XP327	j	
W6XJ327	k	W6XP327	k	
W6XJ327	m	W6XP327	m	
W6XJ327	n	W6XP327	n	
W6XJ327	p	W6XP327	p	
W6XJ327	q	W6XP327	q	
W6XJ327	r	W6XP327	r	
W6XJ327	s	W6XP327	s	
W6XJ327	t	W6XP327	t	
W6XJ327	u	W6XP327	u	
W6XJ327	v	W6XP327	v	
W6XJ327	w	W6XP6	v	Roll syn resol ph A
W6XJ327	x	W6XP6	W	Roll syn resol ph B
W6XJ327	y	W6XP6	X	Roll syn resol ph C
W6XJ327	z	W6XP6	Y	Pitch syn resol ph A

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XJ327	AA	W6XP6	Z	Pitch syn resol ph B
W6XJ327	BB	W6XP6	a	Pitch syn resol ph C
W6XJ327	CC	W6XP6	b	Msh present/selector
W6XJ327	CC	W6XP327	CC	Msh present/selector
W6XJ327	DD	W6XP6	c	Weapon select SCA
W6XJ327	DD	W6XP327	DD	Weapon select SCA
W6XJ327	EE	W6XP6	d	Indicator test
W6XJ327	EE	W6XP327	EE	Indicator test
W6XJ327	FF	W6XP327	FF	
W6XJ327	GG	W6XP327	GG	
W6XJ327	HH	W6XP327	HH	
W6XJ327	JJ	W6XP327	JJ	
W6XJ327	KK	W6XP327	KK	
W6XJ327	LL	W6XP327	LL	
W6XJ327	MM	W6XP6	D	Gnd
W6XJ327	MM	W6XP327	MM	Gnd
W6XJ327	NN	W6XP6	e	Remote on cmd
W6XJ327	NN	W6XP327	NN	Remote on cmd
W6XJ327	PP	W6XP327	PP	
W6XP327	A	W6XP6	E	TOW trigger armed
W6XP327	A	W6XJ327	A	TOW trigger armed
W6XP327	B	W6XP6	F	Shield
W6XP327	B	W6XJ327	B	Shield
W6XP327	C	W6XP6	G	Stow SCA
W6XP327	C	W6XJ327	C	Stow SCA
W6XP327	D	W6XP6	H	Acquisition
W6XP327	D	W6XJ327	D	Acquisition
W6XP327	E	W6XP6	f	Airspeed
W6XP327	F	W6XP6	K	Airspeed return

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XP327	F	W6XJ327	F	Airspeed return
W6XP327	G	W6XJ327	G	
W6XP327	H	W6XJ327	H	
W6XP327	J	W6XJ327	J	
W6XP327	K	W6XJ327	K	
W6XP327	L	W6XP6	L	Port wire cmd A
W6XP327	L	W6XJ327	L	Port wire cmd A
W6XP327	M	W6XP6	M	Port wire cmd B
W6XP327	M	W6XJ327	M	Port wire cmd B
W6XP327	N	W6XP6	N	Wide -medium switch
W6XP327	N	W6XJ327	N	Wide-medium switch
W6XP327	P	W6XJ327	P	
W6XP327	R	W6XJ327	R	
W6XP327	S	W6XJ327	S	
W6XP327	T	W6XJ327	T	
W6XP327	U	W6XJ327	U	
W6XP327	V	W6XJ327	V	
W6XP327	W	W6XJ327	W	
W6XP327	X	W6XJ327	X	
W6XP327	Y	W6XP6	P	Medium -narrow switch
W6XP327	Y	W6XJ327	Y	Medium -narrow switch
W6XP327	Z	W6XJ327	Z	
W6XP327	a	W6XJ327	a	
W6XP327	b	W6XJ327	b	
W6XP327	c	W6XJ327	c	
W6XP327	d	W6XP6	h	Az trk stk cmd
W6XP327	e	W6XP6	i	Az trk stk cmd
W6XP327	f	W6XP6	j	El trk stk cmd
W6XP327	g	W6XP6	k	El trk stk cmd return

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XP327	h	W6XJ327	h	
W6XP327	i	W6XJ327	i	
W6XP327	j	W6XJ327	j	
W6XP327	k	W6XJ327	k	
W6XP327	m	W6XJ327	m	
W6XP327	n	W6XJ327	n	
W6XP327	p	W6XJ327	p	
W6XP327	q	W6XJ327	q	
W6XP327	r	W6XJ327	r	
W6XP327	s	W6XJ327	s	
W6XP327	t	W6XJ327	t	
W6XP327	u	W6XJ327	u	
W6XP327	v	W6XJ327	v	
W6XP327	w	W6XP6	t	Roll syn resol ph A
W6XP327	x	W6XP6	m	Roll syn resol ph B
W6XP327	y	W6XP6	n	Roll syn resol ph C
W6XP327	z	W6XP6	p	Pitch syn resol ph A
W6XP327	AA	W6XP6	q	Pitch syn resol ph B
W6XP327	BB	W6XP6	r	Pitch syn resol ph C
W6XP327	CC	W6XP6	b	Msh present selector
W6XP327	CC	W6XJ327	CC	Msh present selector
W6XP327	DD	W6XP6	c	Weapon select SCA
W6XP327	DD	W6XJ327	DD	Weapon select SCA
W6XP327	EE	W6XP6	d	Indicator test
W6XP327	EE	W6XJ327	EE	Indicator test
W6XP327	FF	W6XJ327	FF	
W6XP327	GG	W6XJ327	GG	
W6XP327	HH	W6XJ327	HH	
W6XP327	JJ	W6XJ327	JJ	

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W6XP327	KK	W6XJ327	KK	
W6XP327	LL	W6XJ327	LL	
W6XP327	MM	W6XP6	D	Gnd
W6XP327	MM	W6XJ327	MM	Gnd
W6XP327	NN	W6XP6	e	Remote on cmd
W6XP327	NN	W6XJ327	NN	Remote on cmd
W6XP327	PP	W6XJ327	PP	
W7XP7	A	W7XP04	A	
W7XP7	B	W7XP04	B	
W7XP7	C	W7XP04	C	
W7XP7	D	W7XP04	D	
W7XP7	E	W7XP04	E	Chassis gnd
W7XP7	F	W7XP04	F	20 v rms. 4 kHz
W7XP7	H	W7XP04	H	7 V rms, 900 Hz, ph A
W7XP7	J	W7XP04	J	7 V rms, 900 Hz, ph B
W7XP7	K	W7XP04	K	40 V, 400 Hz /500 Hz
W7XP7	L	W7XP04	L	-40 V
W7XP7	M	W7XP04	M	-20 V
W7XP7	N	W7XP04	N	EPS rtn
W7XP7	P	W7XP04	P	+10V
W7XP7	R	W7XP04	R	+20 V
W7XP7	S	W7XP04	S	+40 V
W7XP7	T	W7XP04	T	28 V power on
W7XP7	U	W7XP04	U	+28 V
W7XP7	V	W7XP04	V	28 V rtn
W7XP7	W	W7XP04	W	Over voltage signal
WTXP7	X	W7XP04	X	Preregulator out
W7XP7	Y	W7XP04	Y	+17 V bias
W7XP7	Z	W7XP04	Z	-17 V bias

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W7XP7	a	W7XP04	a	+12 V bias
W7XP7	b	W7XP04	b	-12 V bias
W7XP7	c	W7XP04	c	Under voltage off signal
W7XP04	A	W7XP7	A	
W7XP04	B	W7XP7	B	
W7XP04	C	W7XP7	C	
W7XP04	D	W7XP7	D	
W7XP04	E	W7XP7	E	Chassis gnd
W7XP04	F	W7XP7	F	20 v rms, 4 kHz
W7XP04	H	W7XP7	H	7 V rms, 900 Hz, ph A
W7XP04	J	W7XP7	J	7 V rms, 900 Hz, ph B
W7XP04	K	W7XP7	K	40 V, 400 Hz/500 Hz
W7XP04	L	W7XP7	L	-40 V
W7XP04	M	W7XP7	M	-20 V
W7XP04	N	W7XP7	N	EPS rtn
W7XP04	P	W7XP7	P	+10 V
W7XP04	R	W7XP7	R	+20 V
W7XP04	S	W7XP7	S	+40 V
W7XP04	T	W7XP7	T	28 V power on
W7XP04	U	W7XP7	U	+28 V
W7XP04	V	W7XP7	V	28 V rtn
W7XP04	W	W7XP7	W	Overvoltage signal
W7XP04	X	W7XP7	X	Preregulator out
W7XP04	Y	W7XP7	Y	+17 V bias
W7XP04	Z	W7XP7	Z	-17 V bias
W7XP04	a	W7XP7	a	+12 V bias
W7XP04	b	W7XP7	b	-12 V bias
W7XP04	c	W7XP7	c	Under voltage off signal
W8P1	A	W8P2	A	Wire signal A
W8P1	B	W8P2	B	Wire signal B

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W8P1	C	W8P2	C	Start timer
W8P1	D	W8P2	D	Fire indicator monitor
W8P1	E	W8P2	E	
W8P1	F	W8P2	F	Fire return
W8P1	G	W8P2	G	Fire
W8P1	H	W8P2	H	Airframe ground
W8P1	J	W8P2	J	Pitch and yaw balance B
W8P1	K	W8P2	K	Pitch and yaw balance A
W8P1	L	W8P2	L	Missile present
W8P1	M	W8P2	M	Prefire rtn
W8P1	N	W8P2	N	Prefire
W8P1	P	W8P2	P	Wirecut
W8P1	R	W8P2	R	Wirecut rtn
W8P1	S	W8P2	S	Wirecut monitor
W8P1	T	W8P2	T	Pitch VCO
W8P1	U	W8P2	U	Input to pitch phase locked loop
W8P1	V	W8P2	V	Pitch discriminator output
W8P1	W	W8P2	W	Input to yaw phase locked loop
W8P1	X	W8P2	X	Yaw VCO
W8P1	Y	W8P2	Y	Yaw discriminator output
W8P1	Z	W8P2	Z	Time interval t_2
W8P1	a	W8P2	a	Time interval t_3
W8P1	b	W8P2	b	Wire signal dc level
W8P1	c	W8P2	c	Input to balance line signal generator
W8P1	d	W8P2	d	Start monitor
W8P1	e	W8P2	e	Time interval $t_1 + t_2 + t_3$
W8P1	f	W8P2	f	Time interval t_4

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W8P1	g	W8P2	g	Prefire signal relay control
W8P1	h	W8P2	h	Fire signal relay control
W8P1	i	W8P2	i	TSEM ground
W8P1	j	W8P2	j	Wire cut signal relay control
W8P1	k	W8P2	k	Regulated plus voltage +13 V
W8P1	m	W8P2	m	Regulated plus voltage +18 V
W8P1	n	W8P2	n	Regulated minus voltage -18 V
W8P1	p	W8P2	p	Regulated minus voltage -13 V
W8P1	q	W8P2	q	Time interval t_2
W8P1	r	W8P2	r	
W8P1	s	W8P2	s	
W8P1	t	W8P2	t	
W8P1	u	W8P2	u	
W8P1	v	W8P2	v	Shear pin
W8P1	w	W8P2	w	
W8P1	x	W8P2	x	
W8P1	y	W8P2	y	
W8P1	z	W8P2	z	
W8P1	AA	W8P2	AA	
W8P1	BB	W8P2	BB	
W8P1	CC	W8P2	CC	
W8P1	DD	W8P2	DD	
W8P1	EE	W8P2	EE	
W8P1	FF	W8P2	FF	
W8P1	GG	W8P2	GG	
W8P1	HH	W8P2	HH	
W8P1	JJ	NC		
W8P1	KK	NC		
W8P1	LL	NC		

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W8P1	MM	NC		
W8P1	NN	NC		
W8P1	PP	NC		
W8P2	A	W8P1	A	Wire signal A
W8P2	B	W8P1	B	Wire signal B
W8P2	C	W8P1	C	Start timer
W8P2	D	W8P1	D	Fire indicator monitor
W8P2	E	W8P1	E	
W8P2	F	W8P1	F	Fire return
W8P2	G	W8P1	G	Fire
W8P2	H	W8P1	H	Airframe ground
W8P2	J	W8P1	J	Pitch and yaw balance B
W8P2	K	W8P1	K	Pitch and yaw balance A
W8P2	L	W8P1	L	Missile present
W8P2	M	W8P1	M	Prefire rtn
w8P2	N	W8P1	N	Prefire
W8P2	P	W8P1	P	Wirecut
W8P2	R	W8P1	R	Wirecut rtn
W8P2	S	W8P1	S	Wirecut monitor
W8P2	T	W8P1	T	Pitch VCO
W8P2	U	W8P1	U	Input to pitch phase locked loop
W8P2	V	W8P1	V	Pitch discriminator output
W8P2	W	W8P1	W	Input to yaw phase locked loop
W8P2	X	W8P1	X	Yaw VCO
W8P2	Y	W8P1	Y	Yaw discriminator output
W8P2	Z	W8P1	Z	Time interval t_2
W8P2	a	W8P1	a	Time interval t_3
W8P2	b	W8P1	b	Wire signal dc level
W8P2	c	W8P1	c	Input to balance line signal generator

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W8P2	d	W8P1	d	Start monitor
W8P2	e	W8P1	e	Time interval $t_1 + t_2 + t_3$
W8P2	f	W8P1	f	Time interval t_4
W8P2	g	W8P1	g	Prefire signal relay control
W8P2	h	W8P1	h	Fire signal relay control
W8P2	i	W8P1	i	TSEM ground
W8P2	j	W8P1	j	Wire cut signal relay control
W8P2	k	W8P1	k	Regulated plus voltage +13 V
W8P2	m	W8P1	m	Regulated plus voltage +18 V
W8P2	n	W8P1	n	Regulated minus voltage -18 V
W8P2	P	W8P1	P	Regulated minus voltage -13 V
W8P2	q	W8P1	q	Time interval t_2
W8P2	r	W8P1	r	
W8P2	s	W8P1	s	
W8P2	t	W8P1	t	
W8P2	u	W8P1	u	
W8P2	v	W8P1	v	Shear pin
W8P2	w	W8P1	w	
W8P2	x	W8P1	x	
W8P2	y	W8P1	y	
W8P2	z	W8P1	z	
W8P2	AA	W8P1	AA	
W8P2	BB	W8P1	BB	
W8P2	CC	W8P1	CC	
W8P2	DD	W8P1	DD	
W8P2	EE	W8P1	EE	
W8P2	FF	W8P1	FF	
W8P2	GG	W8P1	GG	
W8P2	HH	W8P1	HH	

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W9XP1	A	W9XP331	A	
W9XP1	B	W9XP331	B	
W9XP1	C	W9XP331	C	
W9XP1	D	W9XP331	D	
W9XP1	E	W9XP331	E	
W9XP1	F	W9XP331	F	
W9XP1	G	W9XP331	G	Hydraulic solenoid (shutoff)
W9XP1	H	W9XP331	H	115 V rms, 400 Hz
W9XP1	J	W9XP331	J	115 V rms, 400 Hz rtn
W9XP1	K	W9XP331	K	10 V rms, ph(A+90)
W9XP1	L	W9XP331	L	10 V rms, ph(A+90) rtn
W9XP1	M	W9XP331	M	
W9XP1	N	W9XP331	N	+18 V
W9XP1	P	W9XP331	P	Signal ground
W9XP1	R	W9XP331	R	-18 V
W9XP1	S	W9XP331	S	+12 V port acceleration
W9XP1	T	W9XP331	T	-12 V port acceleration
W9XP1	U	W9XP331	U	Port position status
W9XP1	V	W9XP331	V	Starboard position status
W9XP1	W	W9XP331	W	Port demodulated preamp out
W9XP1	X	W9XP331	X	Port servo amplifier
W9XP1	Y	W9XP331	Y	Starboard demodulated preamp out
W9XP1	Z	W9XP331	Z	Starboard servo amplifier
W9XP1	a	W9XP331	a	Port resolver buffer amplifier sin
W9XP1	b	W9XP331	b	Port resolver buffer amplifier cos
W9XP1	c	W9XP331	c	Starboard resolver buffer amplifier sin
W9XP1	d	W9XP331	d	Starboard resolver buffer amplifier cos

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W9XP1	e	W9XP331	e	Demodulated 400 Hz square wave reference
W9XP1	f	W9XP331	f	+12 V starboard acceleration
W9XP1	g	W9XP331	g	-12 V starboard acceleration
W9XP1	h	W9XP331	h	Port acceleration out
W9XP1	i	W9XP331	i	Port acceleration out rtn
W9XP1	j	W9XP331	j	Starboard acceleration out
W9XP1	k	W9XP331	k	Starboard acceleration out rtn
W9XP1	m	W9XP331	m	Cos ϵ_G
W9XP1	n	W9XP331	n	Cos ϵ_G rtn
W9XP1	p	W9XP331	p	Sin ϵ_G
W9XP1	q	W9XP331	q	Sin ϵ_G rtn
W9XPI	r	W9XP331	r	Launcher stop protection
W9XP1	s	W9XP331	s	26 V rms. 400 Hz. ph (A + 90)
W9XP1	t	W9XP331	t	26 V rms. 400 Hz. ph (A - 90)
W9XP1	u	W9XP331	u	26 V rms. 400 Hz. rtn
W9XP1	v	W9XP331	v	TOW system on
W9XP1	w	W9XP331	w	28 V rtn
W9XP1	x	W9XP331	x	Port activate
W9XP1	y	W9XP331	y	Starboard activate
W9XP1	z	W9XP331	z	Port lower launcher present
W9XP1	AA	W9XP331	AA	Starboard lower launcher preset
W9XP1	BB	W9XP331	BB	Az signal generator
W9XP1	CC	W9XP331	CC	Az signal generator rtn
W9XP1	DD	W9XP331	DD	El signal generator
W9XP1	EE	W9XP331	EE	El signal generator rtn
W9XP1	FF	W9XP331	FF	Boresight pot excit. plus
W9XP1	GG	W9XP331	GG	Boresight pot excit. minus
W9XP1	HH	W9XP331	HH	

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W9XP331	A	W9XP1	A	
W9XP331	B	W9XP1	B	
W9XP331	C	W9XP1	C	
W9XP331	D	W9XP1	D	
W9XP331	E	W9XP1	E	
W9XP331	F	W9XP1	F	
W9XP331	G	W9XP1	G	Hydraulic solenoid (shutoff)
W9XP331	H	W9XP1	H	l15 V rms, 400 Hz
W9XP331	J	W9XP1	J	115 V rms, 400 Hz rtn
W9XP331	K	W9XP1	K	10 V rms, ph(A+90)
W9XP331	L	W9XP1	L	10 V rms, ph(A+90) rtn
W9XP331	M	W9XP1	M	
W9XP331	N	W9XP1	N	+18 V
W9XP331	P	W9XP1	P	Signal ground
W9XP331	R	W9XP1	R	-18 V
W9XP331	S	W9XP1	S	+12 V port acceleration
W9XP331	T	W9XP1	T	-12 V port acceleration
W9XP331	U	W9XP1	U	Port position status
W9XP331	V	W9XP1	V	Starboard position status
W9XP331	W	W9XP1	W	Port demodulated preamp out
W9XP331	X	W9XP1	X	Port servo amplifier
W9XP331	Y	W9XP1	Y	Starboard demodulated preamp out
W9XP331	Z	W9XP1	Z	Starboard servo amplifier
W9XP331	a	W9XP1	a	Port resolver buffer amplifier sin
W9XP331	b	W9XP1	b	Port resolver buffer amplifier cos
W9XP331	c	W9XP1	c	Starboard resolver buffer amplifier sin
W9XP331	d	W9XP1	d	Starboard resolver buffer amplifier cos
W9XP331	e	W9XP1	e	Demodulated 400 Hz square wave reference

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W9XP331	f	W9XP1	f	+12 V starboard acceleration
W9XP331	g	W9XP1	g	-12 V starboard acceleration
W9XP331	h	W9XP1	h	Port acceleration out
W9XP331	i	W9XP1	i	Port acceleration out rtn
W9XP331	j	W9XP1	J	Starboard acceleration out
W9XP331	k	W9XP1	k	Starboard acceleration out rtn
W9XP331	m	W9XP1	m	Cos ϵ_G
W9XP331	n	W9XP1	n	Cos ϵ_G rtn
W9XP331	p	W9XP1	p	sin ϵ_G
W9XP331	q	W9XP1	q	Sin ϵ_G rtn
W9XP331	r	W9XP1	r	Launcher stop protection
W9XP331	s	W9XP1	s	26 V rms, 400 Hz, ph (A + 90)
W9XP331	t	W9XP1	t	26 V rms, 400 Hz, ph (A - 90)
W9XP331	u	W9XP1	u	26 V rms, 400 Hz, rtn
W9XP331	v	W9XP1	v	TOW system on
W9XP331	w	W9XP1	w	28 V rtn
W9XP331	x	W9XP1	x	Port activate
W9XP331	y	W9XP1	y	Starboard activate
W9XP331	z	W9XP1	z	Port lower launcher present
W9XP331	AA	W9XP1	AA	Starboard lower launcher preset
W9XP331	BB	W9XP1	BB	Az signal generator
W9XP331	CC	W9XP1	CC	Az signal generator rtn
W9XP331	DD	W9XP1	DD	El signal generator
W9XP331	EE	W9XP1	EE	El signal generator rtn
W9XP331	FF	W9XP1	FF	Bore sight pot excit, plus
W9XP331	GG	W9XP1	GG	Bore sight pot excit, minus
W9XP331	HH	W9XP1	HH	
W10XP1	A	W10XP237	A	+28 V
W10XP1	B	W10XP237	B	28 V rtn
W10XP1	C	W10XP237	C	Ground

Table 3-5. TSGMS Cable Interconnection - Continued

From		To		Signal Name
W10XP237	A	W10XP1	A	+28 V
W10XP237	B	W10XP1	B	28 V rtn
W10XP237	C	W10XP1	C	Ground
		◀NOTE▶		
		Wll cable is applicable to M65 with C-NITE only.		
W1lXP1	A	W1lXP2	A	+28 V
W1lXP1	B	W1lXP2	B	+28 V
W1lXP1	C	W1lXP2	C	28 V rtn
W1lXP1	D	W1lXP2	D	28 V rtn
W1lXP1	E	W1lXP1	G	
W1lXP1	F	W1lXP2	F	+28 V
W1lXP1	G	W1lXP1	E	
W1lXP1	G	WIKP1	J	
W1lXP1	H	W11XP2	H	Left Diode
W1lXP1	J	W1lXP1	G	
W1lXP1	J	W1lXP1	K	
W1lXP1	K	W1lXP1	J	
W1lXP1	K	W1lXP1	L	
W1lXP1	L	W1lXP1	K	
W1lXP1	L	W1lXP1	T	
W1lXP1	M	W1lXP2	M	28 V rtn
W1lXP1	N	NC		
W11XP1	P	NC		
W1lXP1	R	NC		
W1lXP1	S	W1lXP2	S	Manual Adjust
W1lXP1	T	W1lXP1	L	
W1lXP1	U	W11XP2	U	Log H
W1lXP1	V	W11XP2	T	Log H rtn
W11XP2	A	W1lXP1	A	+28 V
W1lXP2	A	W1lXP2	V	+28 V
W1lXP2	B	W1lXP1	B	+28 V
W1lXP2	C	W1lXP1	C	28 V rtn
W11XP2	D	W1lXP1	D	28 V rtn
W1lXP2	E	NC		
W11XP2	F	W1lXP1	F	+28 V
W1lXP2	G	NC		
W1lXP2	H	W1lXP1	H	Left Diode
W1lXP2	J	NC		
W11XP2	K	NC		
W1lXP2	L	NC		
W11XP2	M	W1lXP1	M	28 V rtn
W1lXP2	N	NC		
W11XP2	P	NC		
W1lXP2	R	NC		
W11XP2	S	W1lXP1	S	Manual Adjust
W11XP2	T	W1lXP1	V	Log H rtn
W11XP2	U	W1lXP1	U	Log H
W11XP2	V	W11XP2	A	+28 V

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
9-19		9-5	
21-2	step 1C		21-2

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"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

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