TM 11-6625-2595-14

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT,

AND GENERAL SUPPORT MAINTENANCE MANUAL

TEST SET, NAVIGATIONAL SET,

TACAN TS-3134/ARN-103

(FSN 6625-476-5554)

HEADQUARTERS, DEPARTMENT OF THE ARMY

DECEMBER 1973

WARNING

DEATH OR SERIOUS INJURY may result from electric hazards unless proper safety measures are observed when operating and maintaining this equipment. Up to 115 vac at 700 volt-amps are present when the equipment is energized.

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CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 31 August 1976

Operator's, Organizational, Direct, and General Support Maintenance Manual TEST SET, NAVIGATIONAL SET, TACAN TS-3134/ARN-103 (FSN 6625-476-5554)

TM 11-6625-2595-14, 28 December 1973, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations are indicated by shaded areas or a miniature pointing hand.

1-1 through 1-3	1-1 through 1-8
2-3 through 2-6	2-3 through 2-6
4-1 and 4-2	4-1 and 4-2
6-5 through 6-8	6-5 through 6-8
FO-2 (1)	FO-2 (1)

4. File this change sheet in front of the publication for reference purposes.

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TECHNICAL MANUAL

NO. 11-6625-2595-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *28 December 1973*

Operators, Organizational, Direct, and General Support

Maintenance Manual

TEST SET, NAVIGATIONAL SET, TACAN TS-3134 / ARN-103

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Test Set, Navigational Set, TACAN TS-3134 / ARN-103 (fig. 1-1) and includes installation, operation, organizational, direct, and general support maintenance instructions. The manual also includes instructions for cleaning, inspection, and replacement of defective components.

b. Instructions for depot maintenance work requirements are provided in DMWR 11-6625-2595.

c. Refer to TM 11-6625-2595-24P for repair parts and special tools list.

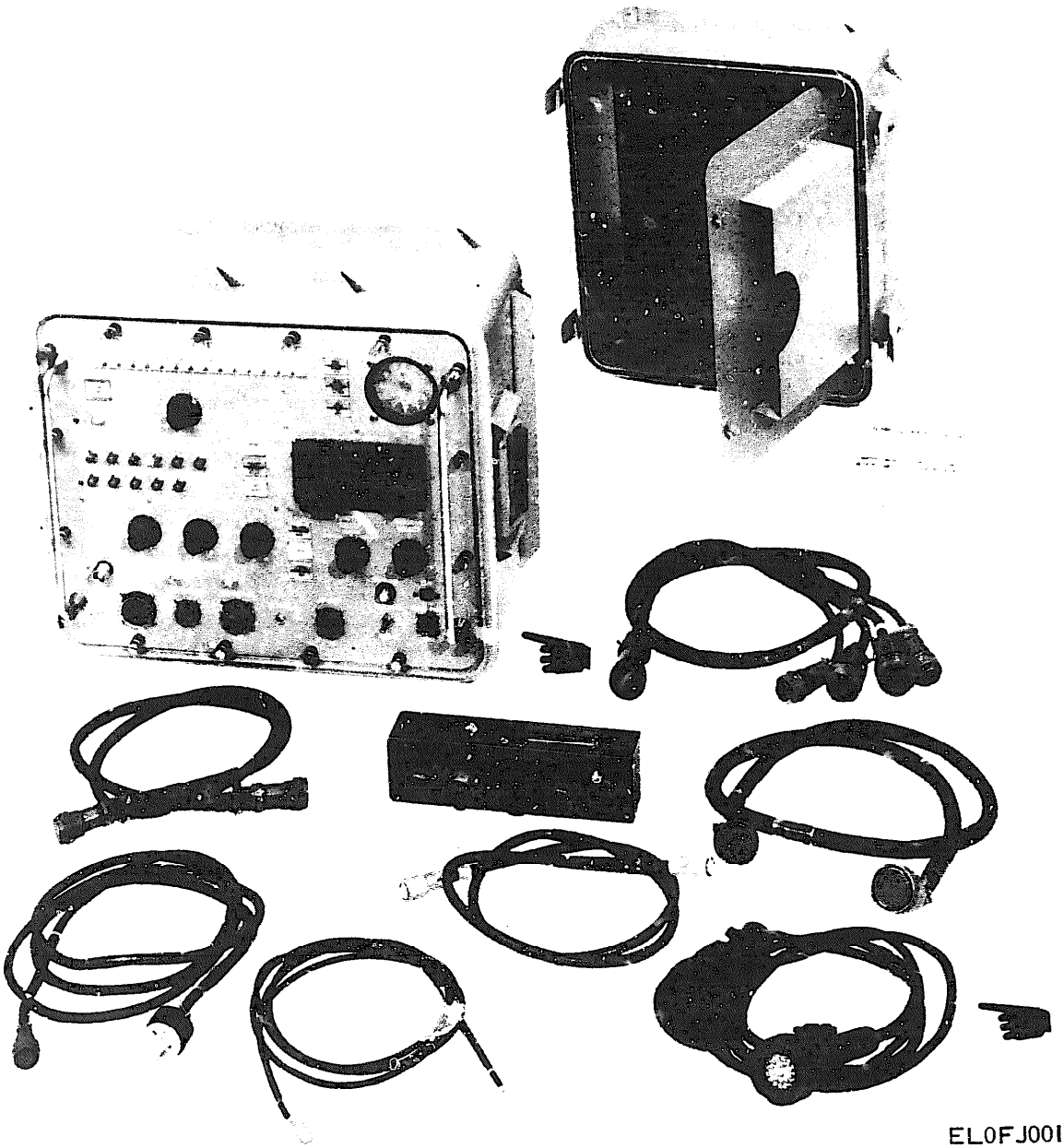

Figure 1-1. Test Set, Navigational Set, TACAN TS-3134/ARM-103.

1-2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58 and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 and DSAR 4500.15.

1-3. Destruction of Army Materiel to Prevent Enemy Use

Demolition of the equipment will be accomplished only upon the order of the Commander. Refer to TM 750-244-2 for procedures to prevent enemy from using or salvaging this equipment.

1-4. Administrative Storage

Refer to TM 740-90-l for procedures, forms, records, and inspections required during administrative storage of this equipment.

1-5. Calibration

There are no calibration requirements for this equipment.

1-6. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

Section II. DESCRIPTION AND DATA

1-7. Purpose an Use

a. Purpose. Test Set, Navigational Set, TACAN TS-3134/ARN-103 provides the stimuli and power necessary for general support testing of Navigational Set, TACAN AN/ARN-103(V). The TS-3134/ARN-103 monitors AGE output signals, signal data converter outputs, and control unit functions of the Navigational Set under test. When used with the Navigational Set built-in test, the TS-3134/ARN-103 can automatically or semiautomatically verify navigational set performance or fault isolate to a faulty module.

b. Use. Test Set, Navigational Set, TACAN TS-3134/ARN-103 is used as a bench or rack-mounted test equipment for the Navigational Set at general sup port level maintenance

1-8. Description

Test Set, Navigational Set, TACAN TS-134/ARN-103 is enclosed in a combination case which also houses the major units making up the TS-3134/ARN-103. Paragraphs 1-9 through 1-12 describe the major units.

1-9. Rack, Electrical Equipment

The electrical equipment rack (fig. 1-2), hereinafter referred to as the test panel, consists of a radio set control, a bearingdistance-heading indicator (ID-663C/U), a power supply, and a card rack for 10 plug-in circuit cards. The test panel is mounted in the combination case and secured with 16 spring-loaded captive screws. Two pins located on the inside of the rear wall of the case are inserted into the test panel chassis to prevent excessive vibration during shipment. Two carrying handles on the front panel facilitate the removal of the test panel from the case for maintenance or mounting in a standard 19-inch rack. The front panel contains all the controls, connectors, and indicators required for performance of fault isolation functions. The connectors for the radio set control, ID-663/U, power supply, and card rack are behind the front panel. A terminal board containing 80 test points for troubleshooting the test panel is connected to the card rack. A coupler for the 50 ohm termination is located behind the TACAN RF connector.

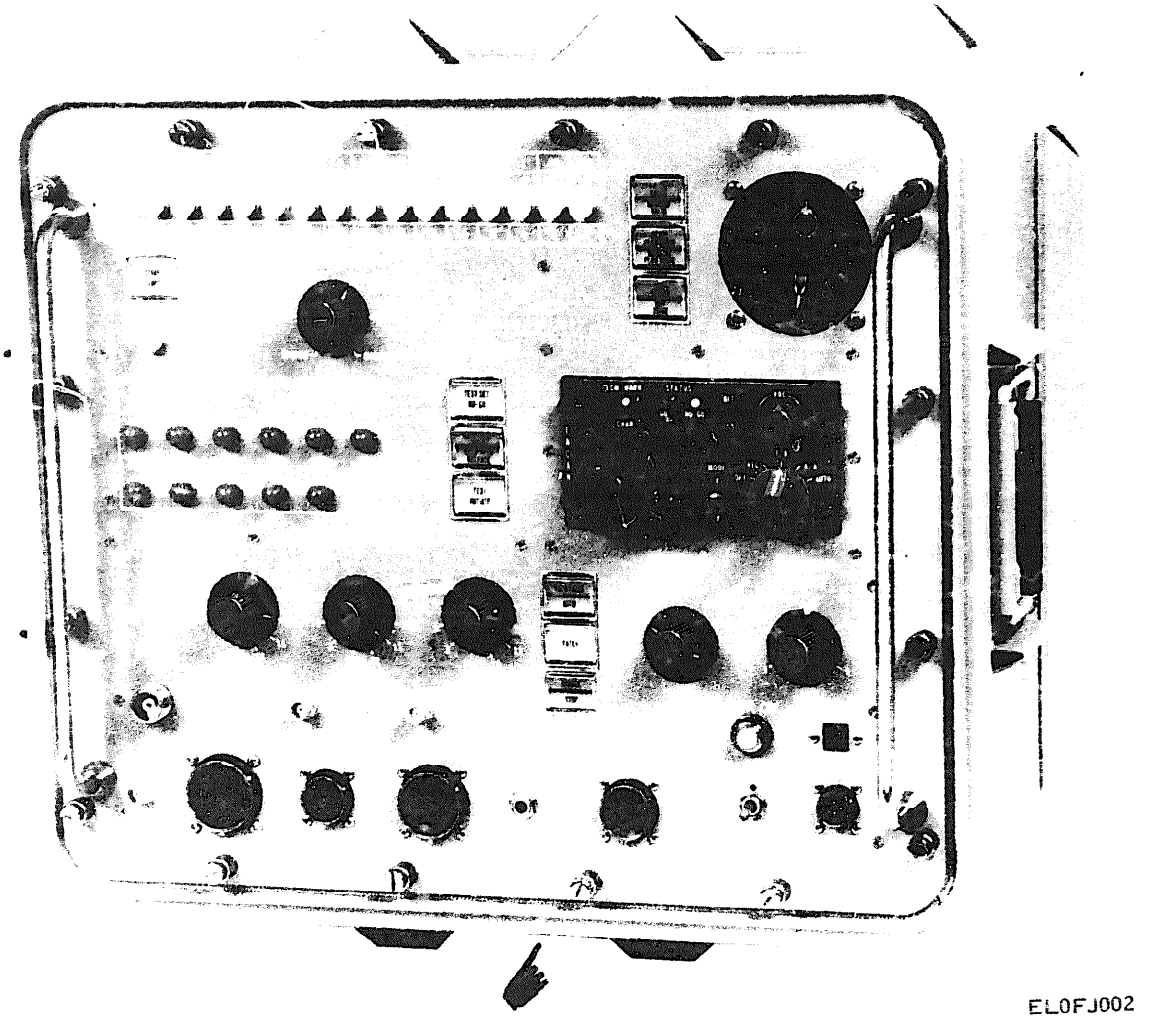

Figure 1-2. Rack, electrical equipment.

1-10. Combination Case

The metal combination case (fig. 1-2) houses the test panel, adapter, cable assemblies, and the technical manual. Two carrying handles are located at each end of the case. The cover is removable and is used to store the adapter, cables and technical manual. The cover is secured with four latches. A relief valve relieves the internal pressure.

1-11. Adapter

The adapter (fig. 1-4) provides a mount for the receiver-transmitter and converter. It is similar to the adapter connector used in the aircraft without the shock mount base. The adapter contains all the interconnecting wiring between the converter and test panel. On top of the adapter are five connectors through which all input power, output analog signals, and computer interface signals are routed to and from the TS-3134/ARN-103. The connector located on the inside wall of the adapter chassis interconnects the converter to the adapter.

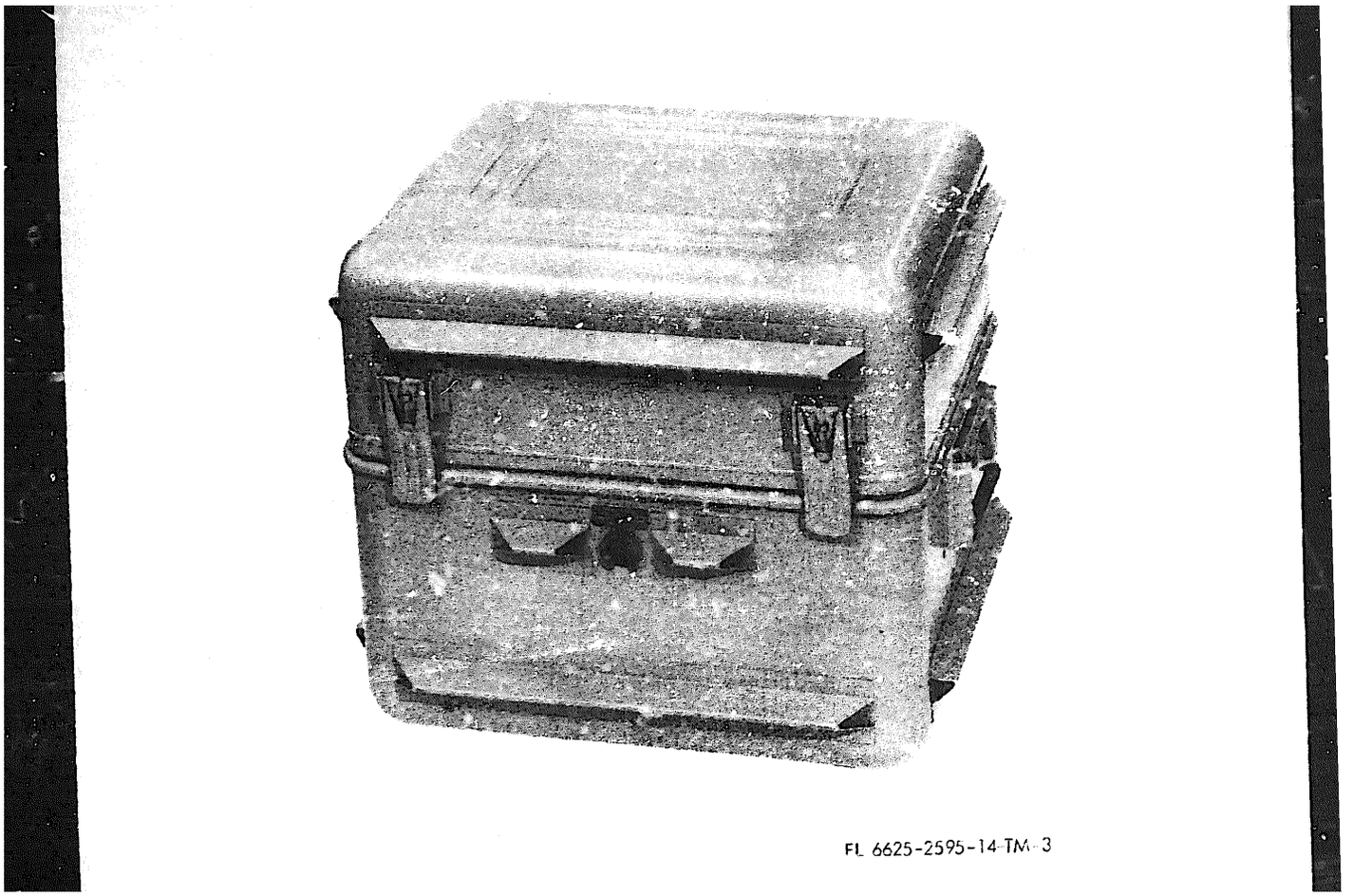

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Figure 1-3. Combination case.

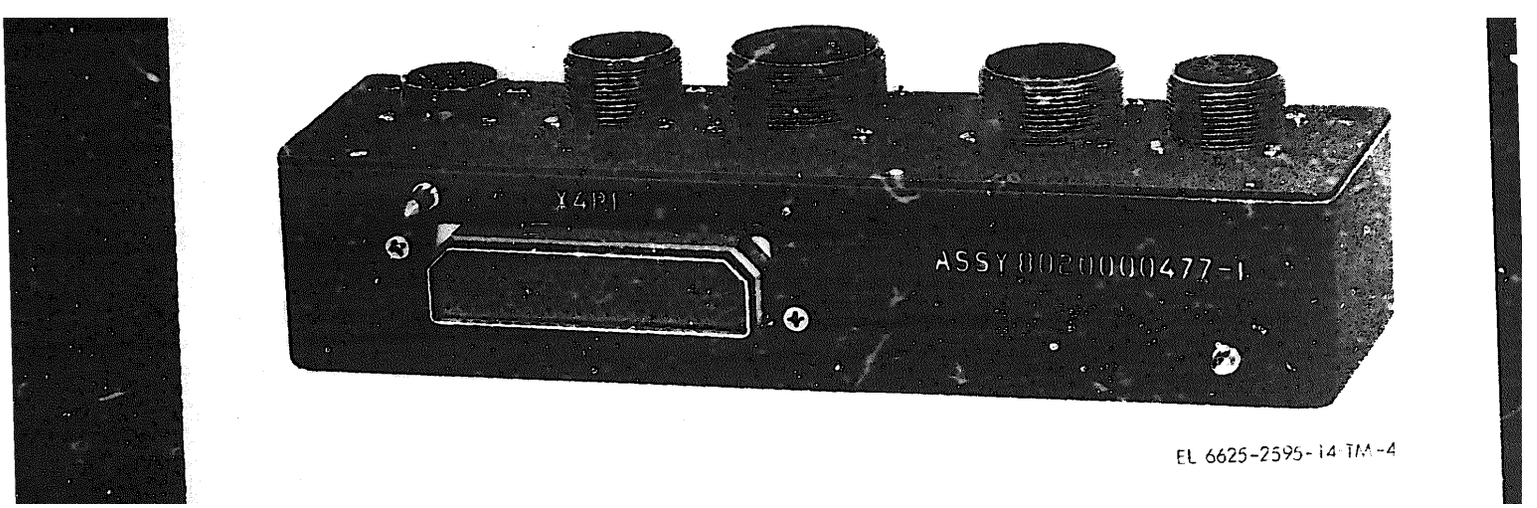

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Figure 1-4 Adapter.

1-12. Cable Assemblies

The cable assemblies (fig. 16) consist of six test cables and an input power cable. The cables are stored in the cover of the combination case.

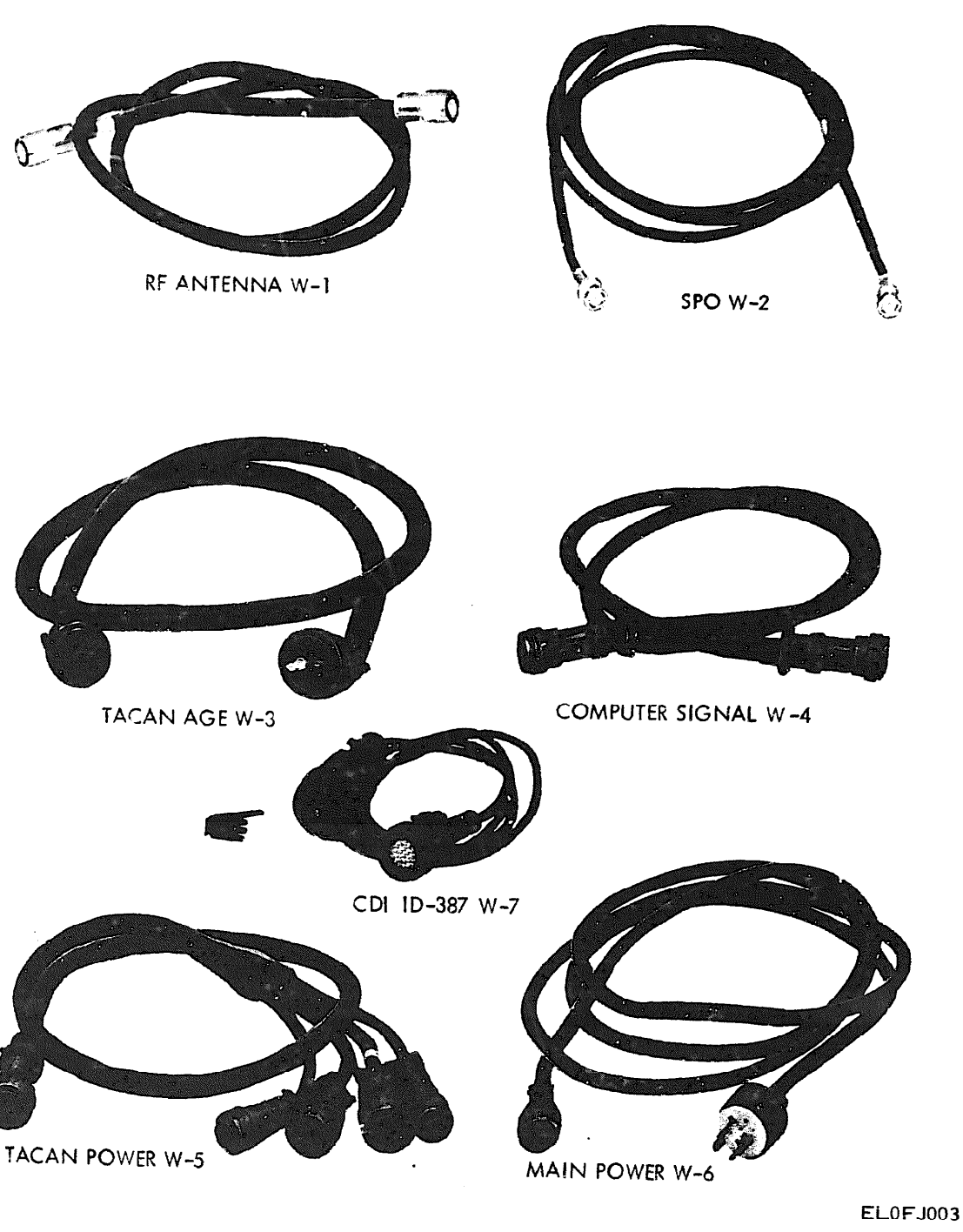

Figure 1-5. Test set cable assemblies.

a. Cable Assembly, RF-ANTENNA (W-1). The RF-ANTENNA cable interconnects the Navigational Set ANTENNA connector with the TACAN RF connector (J1) on the test panel. The cable is 60-inches long and terminated at both ends with an RF coaxial connector.

b. Cable Assembly, SPO (W-2). The SPO cable interconnects the Navigational Set BLANKING OUT connector with the SPO connector (J4) on the test panel. The cable is Z-inches long and is terminated at both ends with a BNC connector.

c. Cable Assembly, TACAN AGE (W-3). The TACAN AGE cable interconnects Navigational Set AGE connector with the TACAN AGE connector (J5) on the test panel. The cable is 60-inches long and is terminated at both ends with a 128-pin connector. A braided shield is grounded to both connector shells.

d. Cable Assembly, Computer Signal (W-4). The computer signal cable interconnects the adapter (2J1) with the CMPTR SIG connector (J6) on the test panel. The cable is 60-inches long and is terminated at both ends with a 26-pin connector. A braided shield is grounded to both connector shells.

e. Cable Assembly, TACAN Power (W-5). The TACAN power cable interconnects four adapter connectors (J1901, J1902, J1905, and J1906) with the TACAN PWR connector (J7) on the test panel. The cable is 84-inches long and is terminated at one end with a 55-pin connector. The other end consists of four 6-inch branches. each terminated in a connector: one seven-pin, one ten-pin, one nineteen-pin, and one twenty-four pin.

f. Cable Assembly, Main Power (W-6). The main power cable interconnects the power source with the MAIN PWR connector (J 10) on the test panel. The cable is 72 inches long and is terminated at one end with a four-pin female plug and a three-pin male plug at the other end.

g. Cable Assembly, Course Deviation Indicator ID-387 (W-7). The CDI cable interconnects an external CDI ID-387, required as ancillary test equipment with the ID-387 connector (J9) on the test panel. The cable is 66-inches long and is terminated at one end with a 31-pin connector and at the other end with a 26-pin connector.

1-13. Tabulated Data

a. Performance Characteristics.

Modes of operation . . . . . Automatic and semiautomatic

Input power.. . . . . 115 vac ± 10 percent
400 ± 20 Hz
700 va (max)

Output power.. . . . . 115 vac 400 Hz
26 vac, 400 Hz
+ 28 vdc

b. Environmental

Ambient temperature. . . . . 32° to 120° F.
Ambient humidity. 90%

1-14. Major Units of Test Set, Navigational Set, TACAN TS-3134 / ARN-103

The following is a list of the major units that make up the TS-3134 / ARN-103. The list also provides up the quantities furnished per set, and the major units, dimensions, weights, and figure reference.

Major Units and Dimensions

Qty	Item	Height (in.)	Depth (in.)	Width (in.)	Weight (lb.)	Fig. No.
1	Rack, Electrical Equipment	15.72	11.00	19.00	37	1-2
1	Combination Case	18.34	19.25	22.25	37	1-3
1	Adapter	2.75	8.75	10.00	10	1-4
	Cable Assemblies					1-5
1	RF-ANTENNA	60 lg.				
1	SPO	72 lg.				
1	TACAN AGE	60 lg.				
1	Computer Signal	60 lg.				
1	TACAN Power	84 lg.				
1	Main Power	72 lg.				
1	CDI ID-387	66 lg.				

1-15. Common Names

The following is a list of major units of Test Set, Navigational Set, TACAN TS-3134 / ARN-103 and the common names for these units used throughout this manual.

Major unit	Common name
Test Set, Navigational Set, TACAN TS-3134 / ARN-103	Test Set
Rack, Electrical Equipment	Test Panel
Radio Set Control	Control Unit
Combination Case	Combination Case
Adapter	Adapter
Cable Assemblies	Test Cables
Cable Assembly, RF-ANTENNA	W-1
Cable Assembly, SPO	W-2
Cable Assembly, TACAN AGE	W-3
Cable Assembly, Computer Signal	W-4
Cable Assembly TACAN Power	W-5
Cable Assembly, Main Power	W-6
Cable Assembly, CDI ID-387	W-7

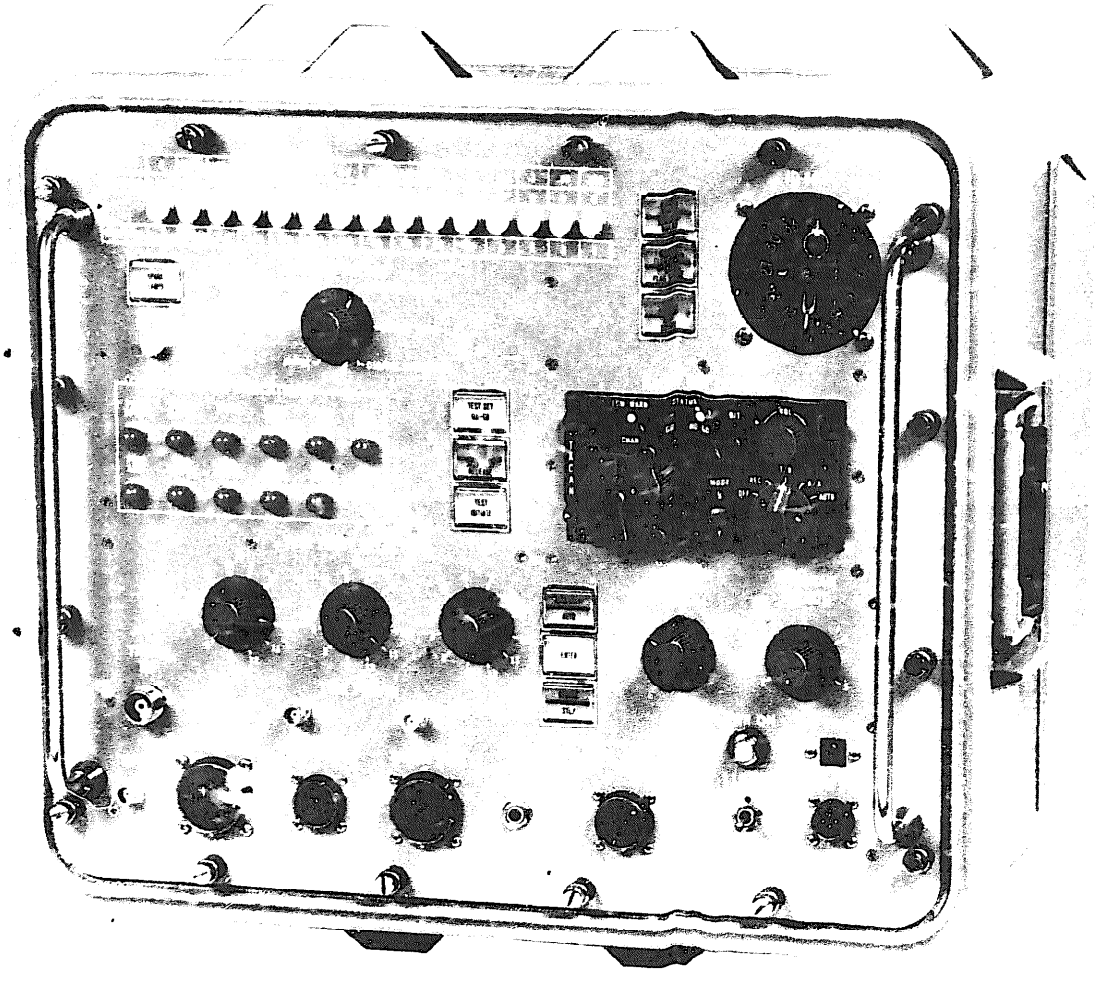

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Figure 1-2. Rack. electrical equipment.

1-10. Combination Case

The metal combination case (fig. 1-3) houses the test panel. adapter. cable assemblies. and the technical manual. Two carrying handles are located at each end of the case. The cover is removable and is used to store the adapter. cables and technical manual. The cover is secured with four latches. A relief valve relieves the internal pressure.

1-11. Adapter

The adapter (fig. 1-4) provides a mount for the receiver-transmitter and converter. It is similar to the adapter connector used in the aircraft without the shock mount base. The adapter contains all the interconnecting wiring between the converter and test panel. On top of the adapter are five connectors through which all input power, output analog signals, and computer interface signals are routed to and from the TS-3134/ARN-103. The connector located on the inside wall of the adapter chassis interconnects the converter to the adapter.

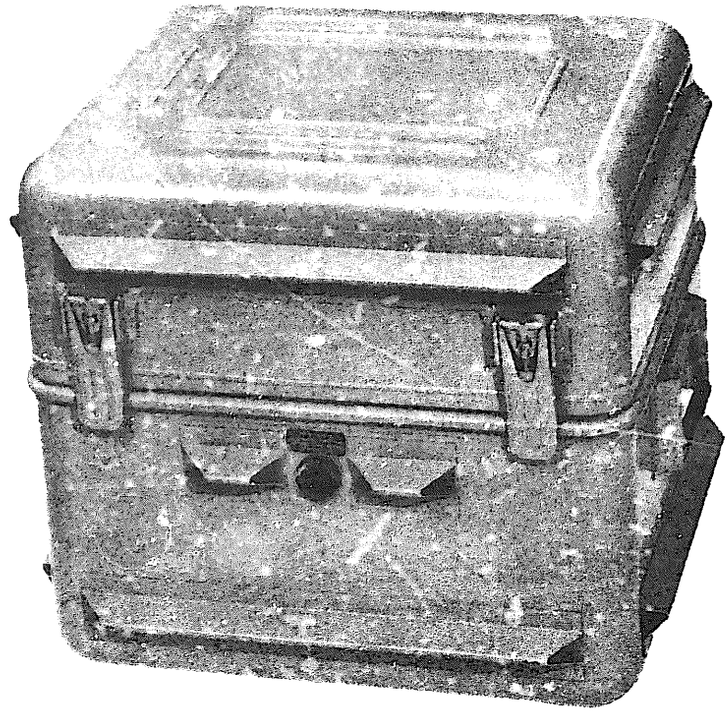

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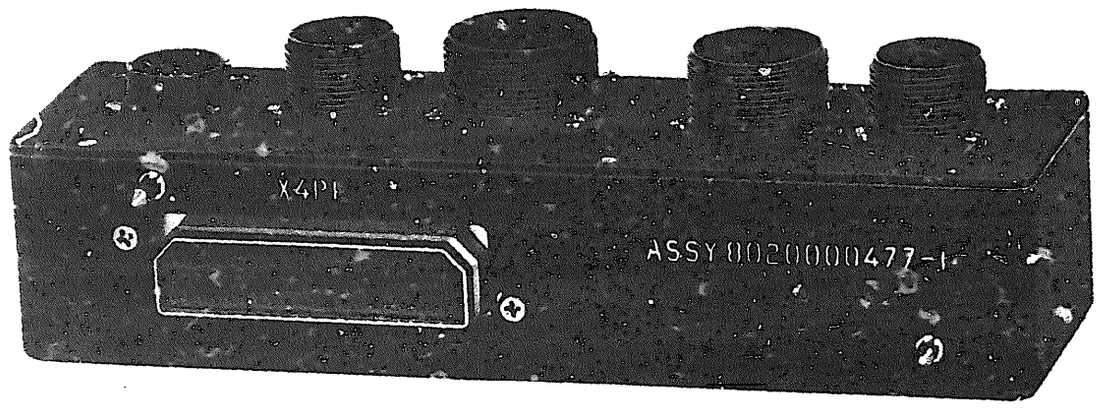
Figure 1-3. Combination case.

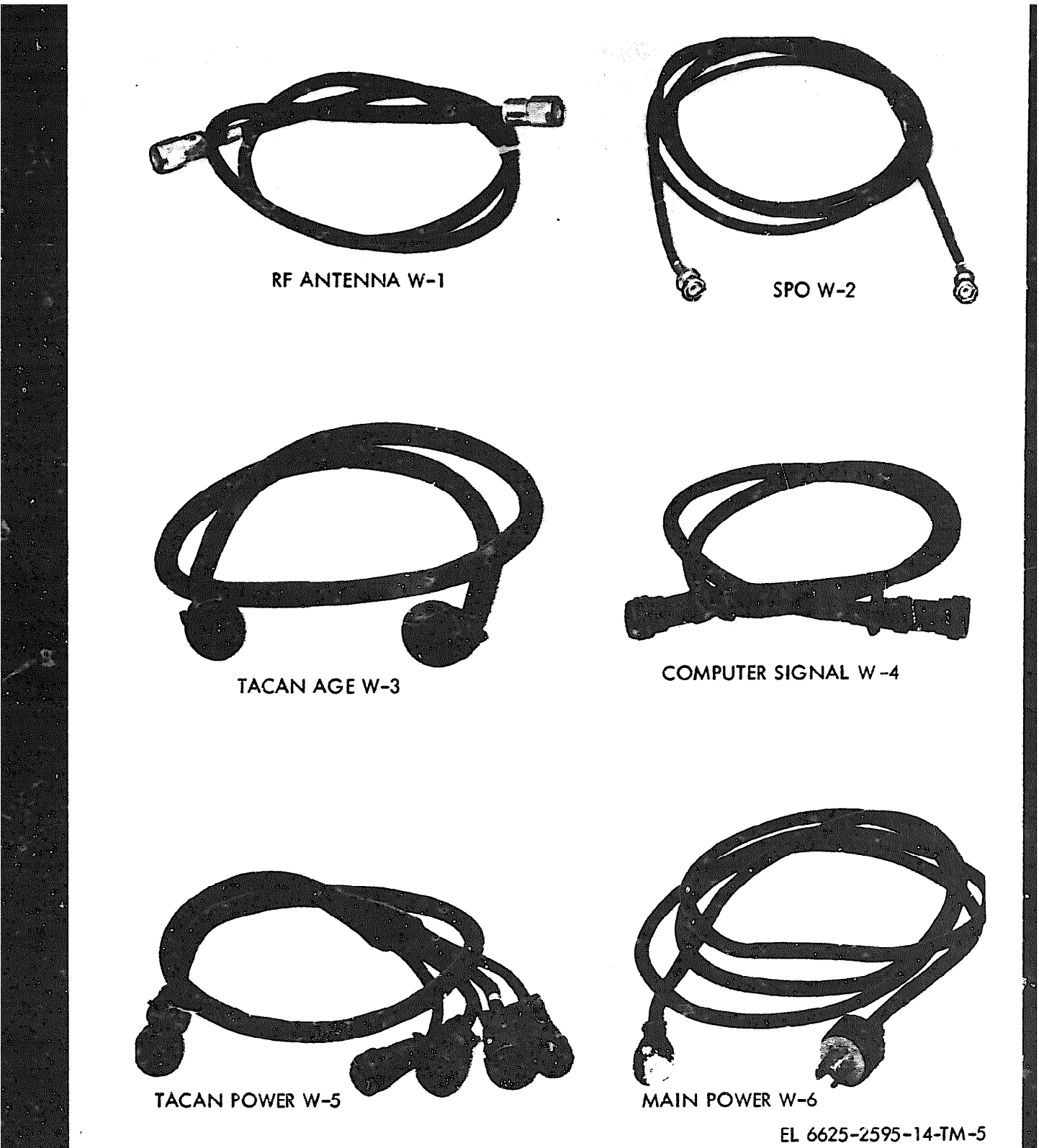


EL 6625-2595-14-TM-4

Figure 1-4. Adapter.

1-12. Cable Assemblies

The cable assemblies (fig. 1-5) consist of five test cables and an input power cable. The cables are stored in the cover of the combination case.



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c. Cable Assembly, TACAN AGE (W-3). The TACAN AGE cable interconnects Navigational Set AGE connector with the TACAN AGE connector (J5) on the test panel. The cable is 60-inches long and is terminated at both ends with a 128-pin connector. A braided shield is grounded to both connector shells.

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f. Cable Assembly, Main Power (W-6). The main power cable interconnects the power source with the MAIN PWR connector (J10) on the test panel. The cable is 72-inches long and is terminated at one end with a four-pin female plug and a three-pin male plug at the other end.

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Output power . . 115 vac, 400 Hz
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Ambient temperature . . . . . 32° to 120° F.
Ambient humidity 90%

1-14. Major Units of Test Set, Navigational Set, TACAN TS-3134/ARN-103

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1	Main Power	72 lg.				

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Major unit	*Common name*
Test Set, Navigational Set, TACAN TS-3134 / ARN-103	**Test Set**
Rack, Electrical Equipment	**Test Panel**
Radio Set Control	**Control Unit**
Combination Case	**Combination Case**
Adapter	**Adapter**
Cable Assemblies:	**Test Cables**
Cable Assembly, RF-ANTENNA	**W-1**
Cable Assembly, SPO	**W-2**
Cable Assembly, TACAN AGE	**W-3**
Cable Assembly, Computer Signal	**W-4**
Cable Assembly, TACAN Power	**W-5**
Cable Assembly, Main Power	**W-6**

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT AND INSTALLATION

2-1. Unpacking

The method of unpacking the test set is shown in figure 2-1. No special instructions are required for unpacking, except that care should be taken not to damage the equipment. Reinsert the packing materials in the carton for possible reuse.

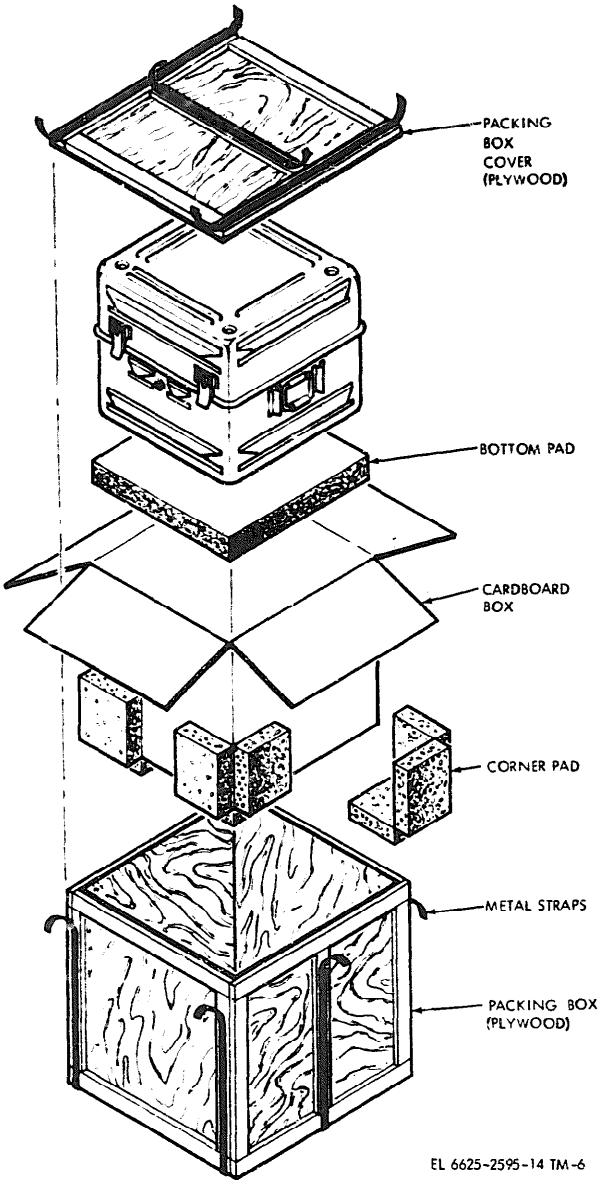

Figure 2-1. Packaging of test set.

2-2. Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. if the equipment has been damaged, report the damage on DD Form 6 (para 1-2).

b. Check the equipment against the component listing in paragraph 1-14 and the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions in TM 38-750. The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

c. Check to see whether the equipment has been modified. (Equipment which has been modified with have the Modification Work Order (MWO) number on the front panel. near the nomenclature plate.) Check also to see whether all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA PAM 310-7.)

2-3. Installation

The following procedures describe the methods of installing the test set in a standard 19-inch rack or on a bench. 'The operator should ensure that there will be room to work on the equipment under test and that the position or location of the test set does not exceed the length of the test cables and input power cable. A 115 vac, 400 Hz, single phase power source is required.

CAUTION

The test set when installed in the cow-bination case weighs in excess of 80 pounds. Two men will be required to lift the equipment.

a. Bench Mounting.

(1) Press relief valve.

(2) Remove cover from combination case.

(3) Remove test cables. power cable, and adapter from cover.

b. Rack Mounting.

(1) Press relief valve.

(2) Remove cover from combination case.

(3) Loosen 16 captive screws securing test panel to case.

(4) Use two handles on front panel to lift test panel out from case.

(5) Insert test panel into 19-inch rack and secure with captive screws.

(6) Remove test cables, power cable, adapter from cover.

Section II. CONTROL, INSTRUMENTS, AND OPERATION

2-4. Operator's Controls.

This paragraph illustrates and describes the functions of controls. indicators. and connectors on the test panel. and on the control unit which is inserted into the front panel. Operators and maintenance personnel should become familiar with the controls shown in figures 2-2 and 2-3 and listed in tables 2-1 and 2-2 before attempting operation or maintenance of the test set.

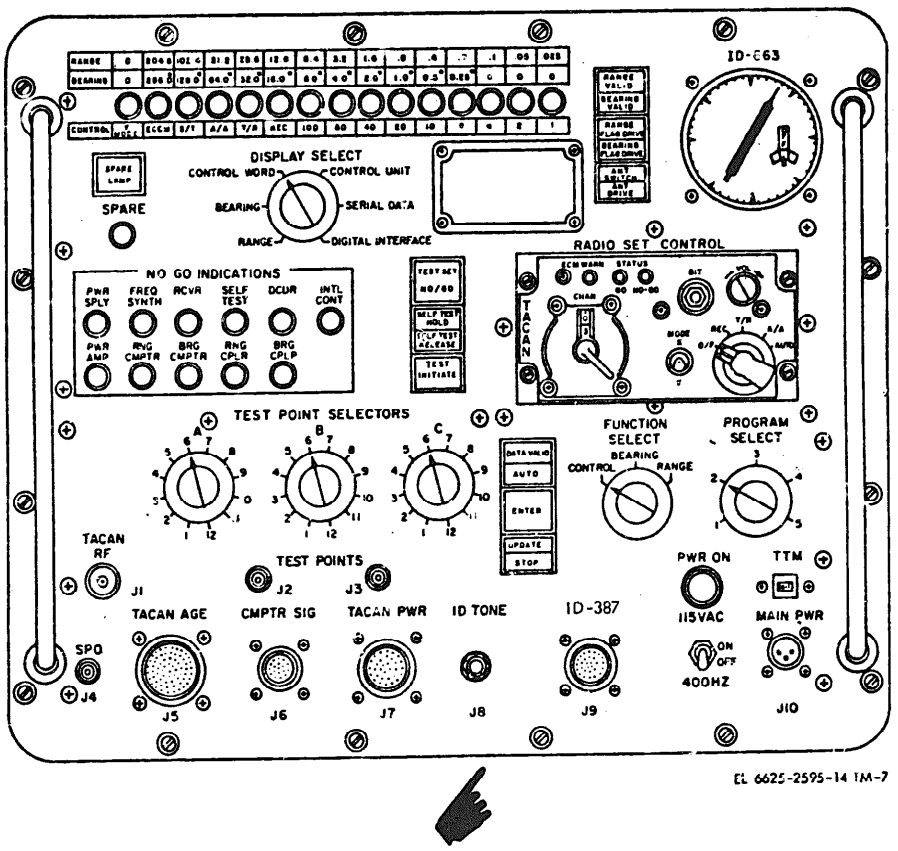

Figure 2-2. Test panel controls, indicators. switches. and connectors.

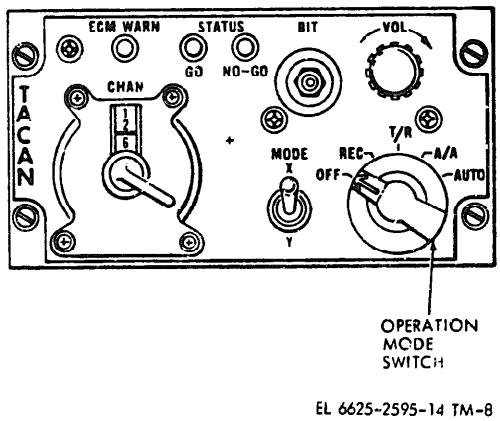

Figure 2-3 Control unit, controls. indicators. and switches.

Table 2-1. Test Panel Operator's Controls

Control. Indicator. or connector	Function
DISPLAY SELECT switch (S2)	A six-position switch that selects digital data for display on the RANGE. BEARING. and CONTROL display lamps.
RANGE	Selects parallel range word from the navigational set to verify the range computer. module performance and fault isolate between the converter and receiver-transmitter.
BEARING	Selects parallel bearing word from the navigational set to verify the bearing computer module performance and fault isolate between the converter and receiver-transmitter.
CONTROL WORD	Selects the parallel control word from the navigational set to allow fault isolation between the internal control module. the word generator (control unit). or the digital interface module in the converter.
CONTROL UNIT	Selects the serial data word from the control unit to verify the performance of the control unit or fault isolate between the control unit and digital interface module.
SERIAL DATA	Selects the serial control word from the navigational set to verify the performance of the digital interface module output to the internal control module.
DIGITAL INTERFACE	Selects the serial data word from the navigational set to verify the performance of the digital interface module and buffer module output to the aircraft computer.
RANGE, BEARING. and CONTROL display lamps (DS20 through DS34)	Displays the digital data selected by the DISPLAY SELECT switch S2.
SPARE LAMP	A spare lamp which is used when one of the display lamps burns out.
RANGE VALID / BEARING VALID indicator (DS35)	Illuminates when navigational set range and bearing computers are locked on. It is used to verify performance and fault isolate navigational set modules.
RANGE FLAG DRIVE / BEARING FLAG DRIVE indicator (DS36)	Illuminates when navigational set flag discrete signals are received. It is used to verify, the performance and fault isolate navigational set modules.
ANT SWITCH / ANT DRIVE indicator (DS37)	Displays the two antenna control signals generated in the navigational set.
ID-663 Indicator (MI)	Displays navigational set analog range and bearing and range flag outputs.
NO GO INDICATIONS indicators (DS5, through DS15)	Displays a NO GO of a faulty navigational set module during the automatic self test cycle.
TEST SET NO, GO indicator (DS17)	Displays the operational readiness of the test set. Illuminates if test set parameters are out of tolerance.

Table 2-1. Test Panel Operator's Controls-Continued

Control, Indicator, or connector	Function
SELF TEST HOLD/SELF TEST RELEASE switch-indicator (DS18)	A two-position switch and split indicator that places the navigational set self test rf generator in continuous operation or returns the navigational set to normal operation.
TEST INITIATE switch-indicator (DS19)	Provides a lamp test of all indicators on the test set and initiates an interruptive self test cycle of the navigational set under test.
TEST POINT SELECTORS switches: A (S1), B (S5), and C (S6).	Three selector switches select the AN/ARM-156 test set and navigational set test points available at TEST points jacks J2 and J3 (table 6-1).
TEST POINTS Jacks (J2 and J3)	Provides test points for signals selected by TEST POINT SELECTORS switches, A (S1), B (S5), and C (S6).
DATA VALID/AUTO indicator (DS2)	The DATA VALID section illuminates when the navigational set digital interface word displayed is valid The AUTO section illuminates when the RADIO SET CONTROL operation mode switch is in AUTO.
ENTER switch-indicator (DS3)	Permits entry of the selected program control word into the navigational set digital interface module. Operates when RADIO SET CONTROL is set in the AUTO position.
UPDATE/STOP switch-indicator (DS4)	A two-position switch and split indicator that controls the computer update rate. When in the UPDATE position, the digital interface display is updated at a 10-Hz rate. When in the STOP position, the last valid word occurring before the STOP command is continuously displayed.
FUNCTION SELECT switch (S3)	Three-position switch (BEARING, RANGE, and CONTROL) selects the desired digital interface data to be displayed. The switch works in conjunction with DISPLAY select switch S2 (DIGITAL INTERFACE position).
PROGRAM SELECT switch (S4)	Selects one of five predetermined mode control words to simulate the navigational set automatic mode of operation. It operates in conjunction with the ENTER switch and when the operation mode switch on the RADIO SET CONTROL is in AUTO. 1-REC mode, channel 77 2-T/R mode, channel 88 3-A/A mode, channel 108 4-S/T and T/R mode, channel 88 5-No mode, channel 80 (Not a TACAN addressed word)
TACAN RF connector (J1)	Connects the navigational set rf output signal to the test set through RF ANTENNA cable W-l.
SPO connector (54)	Connects the suppression pulse output (SPO) from the navigational set BLANKING OUT connector through SPO cable W-l.
TACAN AGE connector (J5)	Connects the AGE signals from the navigational set AGE connector through TACAN AGE cable W-3.
CMPTR SIG connector (J6)	Connects inputs and outputs to and from the navigational set digital interface module through Computer Signal cable W-4.
TACAN PWR connector (J7)	Connects all inputs and outputs (except for digital interface inputs and outputs to and from the navigational set through TACAN power cable W-5
ID TONE jack (J8)	Provides a test point for monitoring navigational set ID tone with a headset.
ID-387 connector (JS)	Provides inputs to a course devion indicator (ID-387 or equivalent) to check navigational set course width and course center alignment.
115 VAC, 400 HZ switch (S7)	A circuit-breaker switch that applies input power to the test set and navigational set.
PWR ON indicator (DS1)	Illuminates when 115 vac, 400 Hz switch S7 is ON.
TTM meter (M2)	Indicates time in hours test set has been in operation.
MAIN POWER connector (J10)	Connects 115 vac, 400 Hz power to the test set through main power cable W-6.

Table 2-2. Radio Set Control Operator's Controls

Control. Indicator, or connector	Function
ECM WARN lamp (DS1)	Indicates when electronic countermeasure signal is trying to Jam the navigational set.
STATUS GO / NO-GO lamps (DS2) and (DS3)	indicates a Go or NO-GO (fault) during navigational set self test.
BIT switch (S3)	Initiates a self test sequence in the navigational set and result is displayed by the NO/ GO GO STATUS indicators. It also illuminates the ECM WARN and STATUS indicators when the switch is pressed to test the lamps.
VOL control (R1)	Adjusts volume of beacon identity tone in navigational se:.
Operation Mode switch (S1)	Selects operating mode of navigational set: OFF-no power to navigational set REC-navigational set receives beacon identity tone and bearing. T/R-navigational set transmits-receives to and from beacon range. bearing, and identify tone. A / A-navigational set transmits-receives range only to and from other aircraft. AUTO-external computer takes control of navigational set.
MODE Switch (S4)	Selects X or Y beacon and navigational set channels.
CHANnel switches (S2A and S2B)	Selects any one of the 126 TACAN channels; outer wheel selects tens and hundreds and inner wheel selects units.

2-5. Preliminary Operational Checks

The following procedures describe the preliminary operational checks of the test set and control unit. Personnel should become familiar with the following operating procedures and the various controls and indicators (para 2-4) before putting the equipment into operation in order to avoid improper operation or possible equipment damage.

a. Test Set Preliminary Operation Procedures. The following procedures provide the operator with the preliminary control settings and operational checks of the test set.

(1) Set 115 VAC, 400 HZ switch to OFF.

(2) Set Radio Set Control operation mode switch to OFF.

(3) Connect power cable W-6 from MAIN PWR connector J10 to 115 vac, 400 Hz, 1 phase source.

(4) Set front panel controls as follows:

DISPLAY SELECT switch. . . . . CONTROL UNIT
FUNCTION SELECT switch. . . . . RANGE
PROGRAM SELECT switch.. . . . . .

(5) Set 115 VAC, 400 HZ switch to ON.

(6) Observe following lamps:

PWR ON.. . . . . Illuminated
TEST INITIATE.. . Illuminated
TEST SET NO / GO. . . . . Not illuminated

NOTE

Other lamps that are illuminated are from previously set positions.

(7) Press and hold TEST INITIATE switch. Observe that all lamps are illuminated except following :

ENTER
DATA VALID
AUTO
UPDATE / STOP
Half of SELF TEST HOLD/ RELEASE. (The half that is illuminated depends on previously set position.

(8) Release TEST INITIATE switch.

NOTE

Whenever TEST INITIATE switch is pressed and then released. a 32-second time period must elapse until switch is illuminated before another test may be initiated.

(9) Set Radio Set Control operation mode switch to AUTO. Press SELF TEST HOLD / RELEASE; 'observe other half illuminates.

(10) Set DISPLAY / SELECT switch to DIGITAL INTERFACE.

(11) Press and hold TEST INITIATE switch. Observe that following lamps illuminate in addition to those lamps illuminated in step 171:

(a) ENTER
(b) DATA VALID
(c) AUTO
(d) Half of the UPDATE / STOP switch.

(The half that is illuminated depends on previously set position.) Press switch and observe that other half illuminates.

(12) Releae TEST INITIATE switch.

(13) Insert headset into ID TONE jack J8.

Turn Radio Set Control VOL control clockwise. Listen for an audio tone.

(14) Set 115 VAC, 400 HZ switch to OFF.

b. RADIO SET CONTROL. The following procedures provide the operator with the preliminary operational check of the RADIO SET CONTROL installed in the test set.

NOTE

These checks may also be made on a control unit used in an aircraft.

(1) Set 115 VAC, 400 HZ switch to ON.

(2) Set DISPLAY SELECT switch to CONTROL UNIT.

(3) Set Radio Set Control operation mode switch to following positions and observe DISPLAY lamps:

REC . RED, T/ R, and A / A lamps not illuminated
T / K T / R lamp illuminated
A/A A / A lamp illuminated
AUTO.. . . . .T/ R and A/ A lamps illuminated

(4) Set Radio Set Control operation mode switch to REC.

(5) Press and hold Radio Set Control BIT switch, Observe that following lamps are illuminated:

CONTROL S / T display lamp
RADIO SET CONTROL STATUS GO and NO-GO lamps, and ECM WARN lamp.

(6) Release BIT switch. Observe that after approximately 2 seconds, STATUS NO-GO and GO lamps, and ECM WARN lamp illuminate sequentially.

(7) Set Radio Set Control CHAN switch to following channels and observe that corresponding control display lamps illuminate.

Channel 1 through 9
Channels 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, and 120

(8) Set Radio Set Control MODE switch to Y. Observe that Control Y display lamp illuminates.

(9) Set Radio Set Control MODE switch to X. Observe that Control Y display lamp goes out.

(10) Insert headset into ID TONE jack J8. Listen for an audio tone.

(11) Vary Radio Set VOL control from extreme ccw position to extreme cw position. Verify that audio tone level increases.

(12) Set 115 VAC, 400 HZ switch to OFF.

Section III. PREPARATION FOR MOVEMENT

2-6. Disassembly for Travel

a. Disconnect all cables and store them in combination case cover.

b. Store adapter in combination case cover.

c. If test panel is rack-mounted, remove rack and install in combination case. Care is to be taken to ensure that test panel is inserted over pins located inside rear wall of combination case.

d. Secure test panel to case with 16 captive screws.

e. Replace and secure cover to combination case.

2-7. Repacking

Repacking of the equipment for shipment or limited storage normally will be performed at a packaging facility or by a repackaging team. Should emergency packaging be required, select materials from those listed in SB 38-100. Package the equipment with the original packaging materials. if possible.

CHAPTER 3

OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. Tools, Test Equipment, and Materials Required

The tools, test equipment, and materials required for organizational maintenance are listed below. Repair parts, special tools, special test equipment, and accessories issued with or prescribed for use with Test Set, Navigational Set, TACAN TS-3134/ARN-103(V) at organizational level of maintenance are listed in TM 11-6625-2595-24P.

a. Tools. Tool Kit, Electronic Equipment TK-101/G.

b. Test Equipment. Headset H-104/G.

c. Materials.

(1) Trichloroethane.

(2) Lint-free cloth (FSN 8305-170-5062 or equivalent).

(3) Detergent.

(4) Soap.

(5) Paint, gray semi-gloss, color No. 26037 per Type I Federal Standard No. 595.

(6) Small paint brush.

(7) Sandpaper, No. 000.

3-2. Painting and Refinishing Instructions

Refer to the applicable cleaning and refinishing practices specified in TB 746-10, Field Instructions for Painting and Preserving Electronics Command Equipment. Remove rust or corrosion from metal surfaces by lightly sanding them with No. 000 sandpaper. Brush two thin coats of paint, gray semi-gloss color No. 26037, on exposed metal areas to prevent further corrosion. Apply paint to only those areas which have been previously painted. Refer to SB 11-573, and AR 746-1.

3-3. General

To insure the test set is always ready for operation, it must be inspected systematically so that defects may be discovered and corrected before they result in se: us damage or failure. The necessary preventive maintenance checks and services to be performed are listed in tables 3-1 and 3-2. The item numbers indicate the sequence of and minimum inspection required. Defects discovered during operation of the unit will be noted for future correction to be made as soon as the operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment. Record all deficiencies together with the corrective action taken on the applicable forms. Instructions for performing the required checks are identified as periodic checks in the general support level of maintenance.

3-4. Instructions for the Performance of Preventive Maintenance Checks and Services

The ' ' s listed in the tables should be checked on a m .y quarterly, or semiannual basis, during periods of use and nonuse. The tables indicate when to inspect, how to inspect, and the Reference column lists the paragraphs or publications containing additional information. If the defect cannot be remedied the equipment will be referred to general support level maintenance.

Table 3-1. Monthly Preventive Maintenance Checks and Services

Sequence number	*Item to be Inspected*	*Procedure*	*Reference*
1	Test Panel	*a.* Inspect for cleanliness	(Para 3-7 *b.*)
		b. Inspect all connectors for cleanliness	(Para 3-7 *b.*)
		c. Inspect for loose or broken knobs	(Para 3-9.)
		d. Inspect for scratches, chipped paint, or corrosion	(Para 3-2.)
		e. Perform preliminary operational checks and observe following:	(Para 2-5 *a.*)
		(1) PWR ON lamp illuminated when 115 VAC, 400 HZ switch set to ON.	
		(2) Display lamps illuminated when TEST INITIATE switch depressed	

Table 3-1. Monthly Preventive Maintenance Checks and Services-Continued

Sequence number	Item to be Inspected	Procedure -	Reference
		(3) Switch indicator lamps illuminated during lamp tests and AUTO mode tests	
2	RADIO SET CONTROL	a. Inspect front panel controls b. Perform preliminary operational check and observe following : (1) STATUS and ECM WARN lamps illuminated during self test (2) Audio tone present on headset.	(Para 2-5b.)
3	Adapter	a. Inspect for cleanliness b. Inspect connectors for cleanliness	(Para 3-7 c.) (Para 3-7 c.)
4	Combination Case	a. Inspect for cleanliness b. Inspect for chipped paint, scratches, or corrosion	(Para 3-7 a.) (Para 3-2.)
5	Test Cables	inspect connectors for cleanliness	(Para 3-7 d.)

Table 3-2. Quarterly Preventive Maintenance Checks and Services

Sequence number	Item to be Inspected	Procedure	Reference
1	Completeness	Check that equipment is complete	(Pare 1-14.)
2	Installation	Check that equipment is properly installed and connected.	(Para 2-3.)
3	Cleanliness	Check that equipment is clean.	(Para 3-2.)
4	Preservation	Check all surfaces for evidence of fungus. Remove rust and corrosion, and spot-paint bare spots.	(Para 3-2.)
5	Publication.	Check that all publications are complete, serviceable, and current.	DA Pam 310-4
6	Spare Parts	Check all spare parts for general condition and method of storage. There should be no evidence of overstock. and all shortages must be on valid requisitions.	TM 11-6625-2595-24P.
7	Equipment Modification	Check DA PAM 310-7 to determine of new applicable modification work orders (MWO'S) have been published All URGENT MWO's must be incorporated immediately. Schedule incorporation of NORMAL MWO's for next semiannual maintenance service.	DA Pam 310-7 and TM 38-7.50

3-5. Quarterly Preventive Maintenance Checks and Services

Quarterly preventive maintenance checks and services on the test set are required as part of organizational maintenance procedures and in some cases, **are** repetitive to the monthly checks **and services. P**eriodic monthly checks and services **constitute a p**art of the quarterly preventive maintenance checks and services and must be **performed concurrently.**

3-6. Semiannual Preventive Maintenance Checks and Services.

Semiannual preventive maintenance checks and **service**s apply to the adapter and test cables. At 6 **month** intervals, the adapter and test cables will be referred to general support maintenance category for continuity checks.

3-7. Cleaning

Inspect each component of the test set for cleanliness. The equipment shall be free of dust, dirt, grease, and fungus. Clean the test set components as follows:

WARNING

The fumes of trichloroethane are toxic. Provide thorough ventilation whenever used. DO NOT use near an open flame. Trichloroethane is not flammable, but exposure of the fumes to open flames converts the fumes to highly toxic, dangerous gases.

a. Combination Case. Clean the combination case with a soft clean lint-free cloth. using soap or mild detergent and water, then dry.

b. Test Panel. The following procedures are provided for cleaning the test panel.

(1) Remove dirt and dust with a lint-free cloth, using solvent if necessary.

(2) Clean meter face gently with lint-free cloth.

(3) Remove grease, fungus, and ground-in dirt by using a cloth dampened (not wet) with cleaning compound.

(4) Use a small brush to clean dirt from connectors.

c. Adapter. Repeat steps (1), (3), and (4) of step b in cleaning the adapter.

d. Test Cables. Remove dirt and dust from cable assembly connectors using a small brush. If necessary, use a lint-free cloth dampened with water; then dry. Do not immerse connectors.

Section II. TROUBLESHOOTING

3-8. Troubleshooting Chart

Troubleshooting of the test set at organizational level maintenance is based on the results observed in paragraphs 2-5 and 3-4. Table 3-3 provides a list of the most frequent malfunctions and the corrective actions to be taken. The repair procedures for those items authorized by the maintenance allocation chart, appendix B, are described in section V. Any malfunction beyond the scope of organizational level maintenance will be referred to general support level maintenance (chap. 6).

Table 3-3. Troubleshooting

Malfunction	*Probable cause*	*Corrective action*
One or more indicator or display lamps not illuminated on test set front panel	Burned out lamp	Replace lamp
Test set controls or switches do not have positive detent or smooth operation	*a.* Loose or broken knob	Tighten or replace knob
	b. Faulty control switch	
Controls and indicator lamps on RADIO SET CONTROL functioning improperly	Faulty RADIO SET CONTROL	

3-9. Repairs

Repair of the test set at organizational level maintenance consists of the repair or replacement of control knobs and lamps on the test panel, but not the RADIO SET CONTROL.

a. Knobs. To replace control knobs, perform following procedures:

(1) Set control to its extreme ccw position.

(2) Remove knob by loosening setscrew at side of knob.

(3) Place new knob in position of shaft with points marker or pointer lined up with first control position.

(4) Secure knob by tightening setscrew.

b. Display Lamps. To replace a display lamp, perform following procedures :

(1) Unscrew lens covering lamp.

(2) Remove lamp.

(3) Replace new lamp and install lens.

c. Switch Indicator Lamp. To replace a switch indicator lamp, perform following procedures:

(1) Pluck out switch indicator assembly.

(2) Remove lamp.

(3) Replace new lamp and install switch indicator assembly.

d. Indicator Assembly Lamp. To replace an indicator assembly lamp, perform following procedures :

(1) Pluck out indicator assembly.

(2) Remove lamp.

(3) Replace new lamp and install indicator lamp assembly.

CHAPTER 4
FUNCTIONING OF EQUIPMENT

Section I. TEST SET FUNCTIONAL DESCRIPTION

4-1. General

a. Section I is a description of the overall functioning of the test set.

b. Section II is a functional description of the individual test set circuits.

c. Abbreviations of the signals and functions used in this chapter are defined when first used. In addition, abbreviations of signal terms are defined in the Glossary.

4-2. Overall Functioning of the Test Set

The test set provides signals and voltages required to test Navigational Set, TACAN AN/ARN-103(V). The overall purpose of the test set is to check the major units of the navigational set and to troubleshoot and fault isolate to the module level. Figure FO-3 is a functional block diagram of the test set showing the interconnection with the navigational set. The test set contains a control unit which can be removed to allow the insertion of a control unit from the aircraft for testing and troubleshooting. A bearing-distance-heading indicator (BDHI) provides bearing and range coupler checks. A test panel connector and cable provide for the external connection and use of a deviation indicator (ID-387) when needed.

a The test set is the source of all primary and operating voltages. The built-in power supply in the test set provides voltages to the test set and the navigational set. The test set supplies 115 vac, 400 Hz, 26 vac, 400 Hz, and +28 vdc to the navigational set. The test set also provides input power to operate the course deviation indicator (ID-387) when used.

b. The signals and voltages generated by the test set are coupled to the navigational set through the adapter by interconnecting test cables. Signals and voltages are coupled back to the test set and are selected or displayed for the test and evaluation of modules in the navigational set.

c. Functional input signals generated by the test set to check out the control unit are a 1 KHz tone to simulate the identity tone and a cycling of the STATUS and ECM WARN indicators. The output signals from the control unit are the turn oncommand (TOC), built-in test (BIT), serial data train (SDT) which includes channel selection and modes of operation, variable control of the identity tone, and AUTO mode discrete.

d. The functional input signal to the navigational set receiver-transmitter from the test set is a discrete signal that activates rf sources in the self test hold condition. The output signals from the navigational set receiver-transmitter are the AGE signals, rf output power, suppression pulse output (SPO). The signals are selected and displayed as fault indications or as correct readings during test and evaluation of the receiver-transmitter.

e. The functional input signals generated by the test set to check out the navigational set converter are five programmed words simulating the action of the computer in requesting data commands and a clock. The output signals from the converter are the analog range and bearing data, TACAN interface discrete (TID), TACAN serial data (TAD), antenna switching command (ASC), and bearing and range flag commands (BFC and RFC). The output signals are selected and displayed as fault indications or correct readings when checking out the converter.

Section II. FUNCTIONAL THEORY OF OPERATION

4-3. Primary Electrical Power

Primary electrical power is applied to the test set from a 115 vac, 400 Hz single phase external source through power cable W-6. When the 115 VAC, 400 HZ switch S7 is in the ON position, the 115 vac is coupled through MAIN PWR connector J10 to noise filter FL1, total time meter (TTM) M2, PWR ON lamp DS1, and power supply PS1. Overload protection is provided by the 10 ampere circuit breaker action of S7. At the same time, 115 vac is applied to TACAN PWR connector J7 and 1D-387 connector J9.

4-40 Test Set Power Supply PSI

The power supply generates the operating power for the test set and navigational set. Primary electrical power for the test set is supplied from a 103.5 to 126.5 vac, 380 to 420 Hz, single phase external source. The input power is fed through an electromagnetic interference (EMI) filter to two stepdown transformers, T1 and T2. The outputs of T1 are rectified. filtered, and regulated to produce five dc voltages; ± 5 volts, ± 12 volts and + 28 volts. The output of T2 provides 26 vac and 10.2 vac. The ± 5 volts and ± 12 volts have overload protection circuits and all dc lines have filters at the outputs. An additional function provided in the power supply is a self-test circuit that tests the output voltages and their circuits. Figure FO-4 is a functional block diagram of the power supply.

a. Voltage Voltage Circuit Card PS1A1. The regulated dc outputs are provided through five series pass voltage regulators. Each regulator has short circuit protection and foldback current limiting.

b. Self-Test Circuit Card PS1A2. The self-test function is performed by applying the positive and negative dc voltages to three separate voltage comparators. The 26 vac is rectified to provide a -28 vdc to be compared with the +28 vdc. The outputs of the comparators are connected in a wired GM configuration and applied to a driver. The output of the driver is the test set power supply status signal (TSPS). The outputs of the comparators are normally a logic 0. The low level input to the driver forces the output driver transistor low thereby inhibiting the TEST SET NO / GO lamp. When any one of the voltage inputs to a comparator is in excess of ± 15 percent of its normal voltage, the comparator output switches to a logic level 1. The driver output switches to a logic 1 and the TEST SET NO / GO lamp illuminates.

4-5. RADIO IO SET CONTROL

II. Function. All controls needed to operate the navigational set are on the RADIO SET CONTROL, referred to as the control unit. The control unit controls power and provides channel, operating mode, and X / Y mode commands to the navigational set, initiates the TACAN interruptive self test cycle, displays GO or NO GO status indications, and electronic countermeasure (ECM) indications. The control unit also controls the volume of the beacon identity tone. Figure 4-1 is a functional block diagram of the control unit.

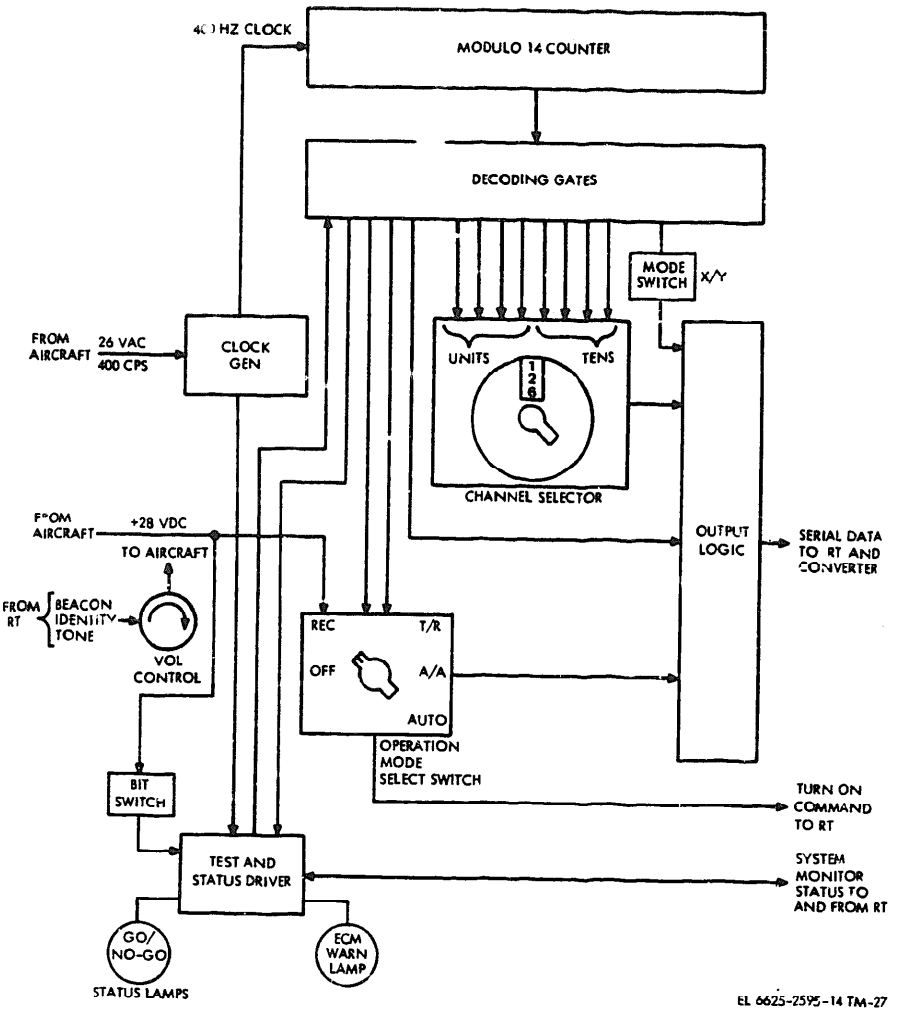

Figure 4-1. Control unit functional block diagram.

b. Block Diagram Analysis. Under normal operating conditions, the operation mode switch, when set in any position other than OFF, connects + +28 vdc to the turn-on command (TOC) line, energizing a relay in the navigational set converter which applies all input power to the navigational set. In the AUTO position, an external computer automatically controls the navigational set. When installed in the test set, the computer actions are simulated by the test set.

(1) The control unit provides channel select data (binary coded decimal) and operating mode select commands to the receiver-transmitter over a single line. A time multiplexing scheme produces a serial data train which contains all the channel and operating mode information. The serial data train is produced by clocking a 14-bit counter, which contains seven flip-flops, at a 400 Hz rate generated by the display control circuit card. The 400 Hz clock pulses are produced by clipping the 26 vac, 400 Hz, supplied from the test set power supply, and shifting the dc level of the resultant pulses. The counter counts from 0 to 14 and back to 0. The 14 count bits are decoded and converted to 14 parallel bits by 14 NOR gates for coding by the channel and operation mode switches. Then the switch outputs and counter outputs are summed in the output logic to produce the serial data train. The control unit normally selects the X beacon channels. In the Y position of the MODE switch, the Y output from the decoding gates is connected to the output logic circuit to change the coding of the serial data train to make the navigational set detect Y channels only. A flip-flop in the output logic flips each time the 14-bit counter completes a cycle. The flip-flop output is summed with the

serial data to alternately produce 14 serial bits of data and 14 zero bits. The output logic then establishes a dc reference of + 28 vdc for logic 0 bits and 0 vdc for logic I bits. Table 4-1 describes the contents and uses of the serial data.

Table 4-1. Serial Data Train Contents

Channel or bit	Description
1	Bit 1 is the sync bit. This bit is always logic 1, and provides for synchronizing the decoding logic in the navigational set.
2	Bit 2 is the self test bit. This bit is logic 1 until the BIT switch is pressed. Then it becomes logic 0. This bit is used to check the control unit operation during the self test cycle.
3	Bit 3 contains the X / Y mode bit. Logic 1 is Y mode; logic 0 is X mode.
4	Bit 4 is the A A bit. This bit tells the navigational set that the air-to-air mode has been selected.
5	Bit 5 is the T/R bit. When the AUTO operating mode is selected. both the A, A bit and the T/R hit will be logic I.
6, 7, 8, 9	Bits 6 through 9 are the units bits of the channel data and represent channels 1, 2, 4, and 8 respectively.
10, 11, 12, 13	Bits 10 through 13 are the tens bits of the channel data and represent channels 10, 20, 40, and 80. respectively.
14	Bit 14 is a spare bit position. and is always a logic 0 or + 28 vdc.

(2) The control unit provides a visual indication during the interruptive self test cycle. The interruptive self test cycle is initiated when the BIT switch is pressed. When the BIT switch is pressed. + 28 vdc is applied to the system monitor status (SMS) line from the control unit to the navigational set. During the time the BIT switch is pressed. a logic 0 is present in the self test position of the control unit serial data train. This allows the self test module in the navigational set to check the operation of the control unit. The + 28 vdc on the SMS line causes the navigational set to enter an interruptive test cycle. Pressing the BIT switch illuminates the GO, NO-GO STATUS and ECM WARN lamps on the control unit to provide a lamp test feature. When the BIT switch is released, all lamps extinguish until either a TACAN GO or NO-GO display is indicated. The entire interruptive test cycle lasts approximately 30 seconds. During the last 10 seconds. the results. either GO or NO-GO, are displayed at the control unit.

(3) A simulated self test cycle is provided by the test sequence control circuit card when checking the control unit without a navigational set attached. The control for the test cycle is initiated by the test set and the simulated ID Tone is routed through relay K1. The relay is deenergized when there is no navigational set connected to the test set.

4-6. Bearing Distance Heading Indicator (BDHI) ID-663/U

The ID-663C/U displays an accurate analog readout of the outputs from the bearing and range couplers in the navigational set converter during an interruptive self test. When the navigational set is not in the fixed range and bearing mode of the interruptive self test. the BDHI displays the range and bearing parameters of the current navigational set test in progress.

4-7. Test Sequence Control Circuit Card Al

The A1 circuit card contains the logic circuitry necessary to control the automatic fault isolation test cycle. This card provides the memory update and the 10 second display enable pulse used to control the module fault display. This card also generates the 10 millisecond (TMG) and 1 second (OSG) time base signals used by the signal processor cards to provide control of the test self test status display and the cycling of the control unit STATUS and ECM WARN displays. This circuit card also contains a driver for the simulated ID tone. This signal is generated from a 1 KHz clock from the display control circuit card 1A7. The resulting simulated ID tone is used to test the VOLume control on the control unit when the

navigational set is not connect. Figure FO-5 is a functional block diagram of the circuit card.

a. Automatic Fault Isolation Sequence. The automatic fault isolation test sequence begins when the TEST INITIATE switch is pressed and the switch test initiage (STI) signal becomes a logic 0 and STI becomes a logic 1. When the TEST INITIATE switch is released. STI and STI assume their original state, triggering an RS flip-flop flop which sets the counter control circuitry. One output of the counter control is the test initiate lamp (TIL) signal which is a logic 1 that turns the TEST INITIATE switch indicator off during the 32 second test cycle. A second output of the counter control is the reset (REST) signal whose level is a logic 0 during the time the TEST INITIATE switch is pressed and returns to a logic 1 when the switch is released. The third output of the counter control enables the transfer gate allowing a 1 Hz pulse (generated from a 10 Hz input and a divide-by-ten decade counter) to pass. This 1 Hz output of the gate performs two functions. One function is that each time the transfer gate goes to a logic 0, a one-shot is fired to produce an 18 microsecond negative pulse which is the 1 second reset (OSR) pulse. This pulse is used as a time reference in the AGC processor circuit card. The other function of the 1 Hz output gates a 16 second delay circuit (generated by a divide-by-sixteen) which enables a control gate, allowing the 1 Hz pulses to trigger the master counter after the 16 second delay. The master counter is a binary divided-by-sixteen with a decoder set to decode counts of 3, 5, and 6 on its outputs. At the count of three, the 3 to 4 count decoder output is a logic 0 and stays at logic 0 until the count of four, generating the 1 second gate ($\overline{OSG}$) which is a 1 second negative pulse used as a time base in the signal processor cards. Also. at the count of three. a 100 Hz signal is gated into the 10 millisecond gate generator. generating the 10 millisecond gate (TMG) which is used as a time base in the signal processor cards. At the count of five, the 5 second decoder output goes to a logic 0 and fires an 18 microsecond one-shot. The output of the one-shot is an 18 microsecond negative going pulse which generates the memory (MRY) gate used to update the fault memory register in the fault precedence logic circuit card. At the count of six the 6 to 16 second decoder output is a logic 0 and stays low until the count of 16 is reached. The resulting 10 second pulse is the display test initiate signal ($\overline{DTI}$) used to control the module fault status display. When the master counter reaches a count of 16, the output of the 0 to 16 second decoder resets the counter control and the 32 second test sequence is completed -

b. Control Unit Self Test Cycle. When the BIT switch on the control unit is pressed, the two STATUS lamps and ECM WARN lamp on the front panel are illuminated and the 0 to + 28 vdc SMS signal is raised to + 28 vdc. and drops to 0 vdc when the BIT switch is released. The SMS is converted to a transistor-transistor logic (TTL) level and enables a binary counter when it drops to 0 vdc. The counter is clocked by the 1 Hz signal (generated from the 10 Hz input). When the BIT switch is released, the lamps are turned off and the binary counter begins counting. The output is monitored for counts of two, four, six, and eight. At the count of two (2 seconds), + 5 vdc is applied to the SMS line and the NO-GO STATUS lamp is illuminated for 2 seconds. At the count of four, + 12 vdc is applied to the SMS line and the GO STATUS lamp is illuminated for 2 seconds. At the count of six. - 12 vdc is applied to the SMS line and the ECM WARN lamp is illuminated for 2 seconds. At the count of eight, all lamps are off and the test cycle is completed. The simulated ID tone comes from a driver that has a I KHz input ant! provides a simulated ID Tone (TIDD) that is supplied to the control unit through transformer TM and relay K1.

c. Test Set Test Status. The 100 Hz signal (developed from the 4 MHz oscillator in the display control circuit card) fires a retriggerable 22 microsecond one-shot. Since the one-shot is retriggerable. the output is a logic 1, provided the 100 Hz input period does not exceed 22 milliseconds. The output of the one-shot is NANDED with test set power supply status (TSPS), a logic o signal from the power supply. The resulting signal is the test set NO-GO (TSNG) status signal. The status signal will indicate NO-GO if either TSPS is NO-GO or the clock signal is missing.

4-8. Fault Precedence Logic Circuit Card A2

The A2 circuit card contains the necessary circuitry to make logical decisions as to which module of the navigational set is malfunctioning. The inputs to the circuit card are signal status outputs from the four processor cards. The logical decision (which module is at fault) is stored in an 11 bit memory register. This data is then displayed during the 10 second display period. The circuit card also contains a signal processor circuit for the navigational set range computer clock signal. The high frequency clock frequency is monitored for a GO from 12 to 14 MHz. Figure 4-2 is a functional block diagram of the fault precedence logic circuit card.

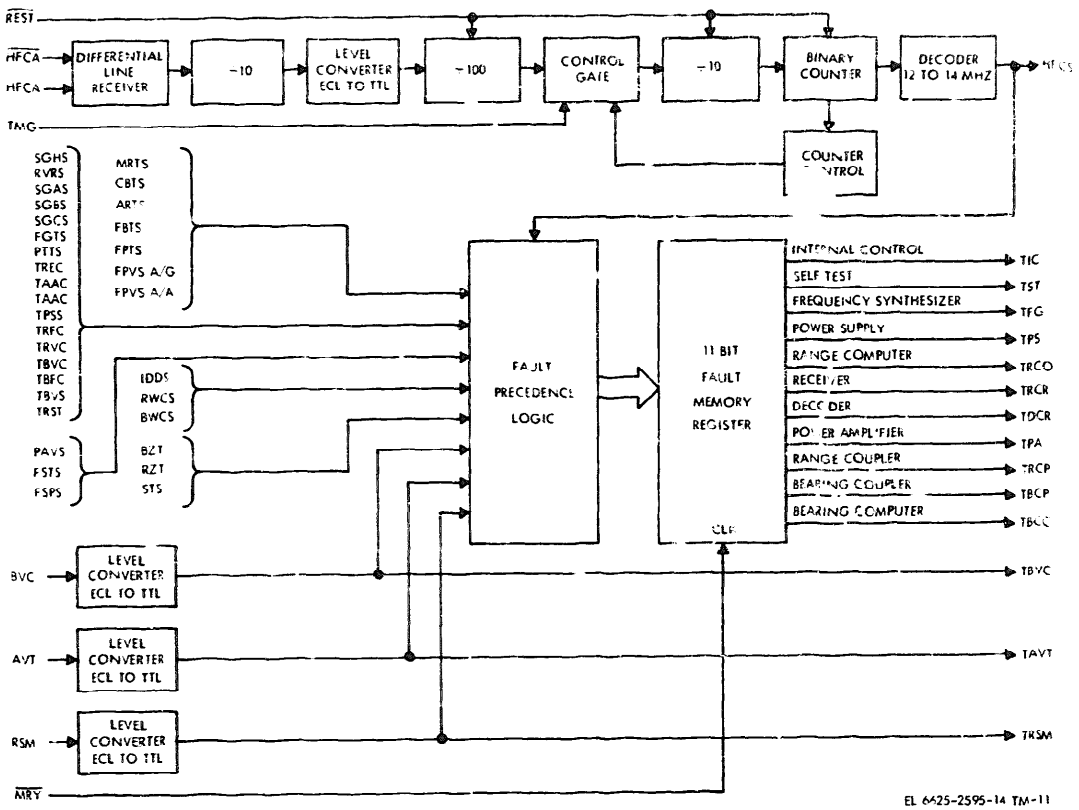

Figure 4-2. Fault precedence logic circuit card functional block diagram.

a. High Frequency Clock Signal (HFCS) Processor Circuit. The input high frequency clock A (HFCA) is received by a differential line receiver and scaled by a divide-by-ten counter. The resulting 1.1964 MHz signal is converted into a TTL level signal to drive two decade counters which make up a divide-by-one-hundred circuit. The output of the divide-by-one-hundred circuit is gated by a 10 millisecond gate (TMG) which occurs 19 seconds after test initiate. The gated signal is fed into a divide-by-ten circuit and then goes into a binary counter whose output is monitored by a decoder for counts 12 and 14. The output of the decoder (HFCS) is a logic 1. The outputs of the divide-by-one-hundred. the divide-by-ten. and the binary counter are also controlled by the REST pulse. When the TEST INITIATE switch is initially pressed and released. the REST signal is a negative going pulse which clears the divide-by-one-hundred, the binary. and divide-by-ten counters to zero. At this time, the counter control is also reset. After the application of the REST pulse. the counters are ready to count with the arrival of the TMG signal. The counters will count during the duration of TMG or until a count of sixteen. the control counter control is clocked and the count is inhibited.

b. Fault Precedence Logic. The remainder of the circuitry contains the fault precedence logic. The 11 bit fault memory registers are updated by the memory clock pulse (MRY) which occurs 21 seconds after test initiate. MRY is an 18 microsecond negative going pulse. The output of the register is supplied to the display drive No. 2 circuit card. The fault precedence logic circuitry accepts the navagational set mode information and the status output from the signal processor cards and determines which module or modules fair to exhibit within tolerance signals as detected by the signal processors. The fault precedence logic circuit card also performs the emitter coupled logic (ECL) to TTL conversion for the bearing valid command (BVC). auxiliary beating valid test (AVT), and the

range short memory (RSM) navigational set signals.

4-9. Automatic Gain Control (AGC) Circuit Card A3

Circuit card A3 contains the necessary circuitry to monitor the navigational set fast and slow AGC, receiver video, and the YIG tuning current. Also included is the buffer / converter circuitry for range and bearing flag commands (BFC and RFC). ECL-to-TTL conversion to provided for TACAN mode control bits (T / R. A,' A, and Y Mode!, channel select parallel bits (CSA through CSH), range and bearing valid (RVC and BVS), receiver status (RST), and power supply status (PSS). Figure FO-6 is a functional block diagram of the circuit card.

a. Flag Command Converter Circuitry. The range and bearing flag commands (RFC and BFC) are 28 vdc / 0 vdc discrete signals. Both are converted to TTL logic levels. The outputs are translated range flag command (TRDC and $\overline{\text{TRDC}}$) and translated bearing flag command (TBFC and $\overline{\text{TBFC}}$) signals which are used for the display section and other signal processors.

b. Fast Gain Control Test (FGT) Monitoring Circuit. The FGT input is monitored by two voltage comparators to produce a fast gain control status signal (FGTS) The comparators have a threshold or - 0.7 to - 1.7 vdc. The outputs of the Comparators are tied together to provide an OR function to produce the FGTS signal. FGTS is in a Go condition (logic I I when FGT is between -0.7 and —1.7 vdc.

c. Preselector (YIG) Tuning Current (PTT) Monitoring Circuit. The $\overline{\text{PTT}}$ input is monitored in the same manner as FGT with the exception of the threshold voltages. The output status signal (PTTS) is in a GO condition (logic 1) when PTT is within the threshold limits of -i- 1.2 and + 1.8 vdc.

d. ECL-to-TTL Conversion Circuitry. The ECL-to-TTL converters convert the following status and channel select control bit ECL logic to TTL logic:

CSA through $\overline{\text{CSH}}$ Channel select bits A through H

$\overline{\text{PSS}}$ ..... Power supply status
$\overline{\text{RST}}$ Receiver status
RVC Range valid command
BVS Bearing valid status
RTM Receiver-transmit mode
$\overline{\text{AAC}}$ Air-to-air command
YYC Y mode control bit
$\overline{\text{STC}}$ Self-test command

NOTE

When the $\overline{\text{AAC}}$ and RTM outputs are false, a decoder provides a TACAN receive signal (TREC and $\overline{\text{TREC}}$).

e. Composite Video Test (CVT) Monitoring Circuitry. The CVT input is monitored for a repetition rate of greater than 480 pps in the A / A mode and 3840 pps in the A / G mode. The video is indirectly amplitude monitored by a detector preceding a rate counter. The TTL output of the detector is divided by two to supply count input to a divide-by-ten decade counter. The output of the divide-by-ten clocks binary counters that are mechanized as a divide-by-twenty-four and divide-by-eight. The outputs of the binary counter is applied to a select gate which monitors the count of CVT in either the A / A or A / G modes. In the A / A mode, the divide-by-eight is bypassed. The output os the select gate is applied to a control gate that is enabled by OSG and the output represents the CVT count for 1 second. The binary counters are set to zero count by the REST at the start of the test initiate cycle. The divide-by-twenty-four counter is decoded to provide the receiver video rate status signal (RVRS). The output RVRS is in a GO condition (logic 1) in the A / A mode if the CVT rate is greater than 480 pps (divide-by-two, ten. and twenty-four), and a logic 1 in the T / R mode if, the CVT rate is greater than 3840 pps (divide-by-two, ten. eight, and twenty-four).

f. Slow AGC Test (SGT) Monitoring Circuitry. The SGT input signal is fed into an operational amplifier that is mechanized as a high impedance voltage follower and is used to buffer the SGT signal. The monitoring of SGT provides two functions: provides three DC output status signal levels and detects SGT in a hunting condition. The three DC status level are SGAS, SGBS, and SGCS. The hunting condition is SGHS. The SGT is applied to three comparators whose threshold voltages are as follows:

SGAS above -2.0 vdc
SGBS below -4.0 vdc
SGCS below - 7.0 vdc

The SGT hunting function is defined as when the SGT signal is varying with an AC component more than 1 vpp amplitude at an approximate rate of 0.2 Hz. The SGT is fed through an AC detector which provides an AC component riding on a DC level. An additional DC offset voltage is also applied to the output and both voltages are fed into a voltage comparator. The output signal is a TTL logic level used to clock a sampling gate. The 1 second reset

(OSR) pulse from the test sequence control circuit card sets the sampling gate once each second which, in turn. gates a counter allowing it to be triggered once each second. The output of the counter is applied to a decoder which decodes the state of three counts. The counter is reset at the beginning of the test initiate cycle by the REST pulse. The output of this processor (SGHS) is strobed 21 seconds after the test cycle begins and if the SGHS is low, the SGT cycle is said to be hunting. Therefore. detection of three cycles of the AC component during a gate time of 21 seconds will constitute an SGT hunt condition.

4-10. Signal Processor No. 2 Circuit Card A4

Circuit Card A4 contains the necessary circuitry to process several output signals of the navigational set range computer, power amplifier-modulator, and frequency synthesizer. The status of these signals is determined and fed to the fault precedence circuit card for further determination of a faulty module. Figure FO-7 is a functional block diagram of the circuit card.

a. Range Computer Signals Monitoring Circuitry. The first pulse command range (FPCR) and second pulse command (SPC) are combined into one signal status to provide a first and second pulse status signal (FSPS). The reason for this is their time relationship. SPC will follow FPCR by a definite time interval depending on the navigational set mode. FPCR and SPC input signals are both narrow pulses equal to or less than 1 microsecond at ECL voltage levels. They are both buffered. stretched to approximately 4 microseconds. and converted to TTL levels to provide translated first pulse command range (TFPCR) and translated second pulse command (TSPC) signals, respectively. The flip-flops and counters are reset by the REST pulse which occurs at the beginning of the teat initiate cycle.

(1) The converted FPCR is applied to a count control which enables two flip-flops that form a divide-by-four circuit. A 4 MHz reference clock. supplied from the display control card. clocks the output of the divide-by-four into a decade control at a I 1-MHz rate. The output of the decade control is applied to a counter and the mode count decoder. The output of the counter is also applied to the decoder. The decoder consists of three select gates that are controlled by the navigational set mode. The output of the decoder is fed through a transfer gate to a 4 microsecond one-shot multivibrator. The firing of the one-shot depends on the mode of operation : 10 microseconds after FPCR is T / R-X and A / A-X modes. 22 microseconds after FPCR in A / A-Y mode. 34 microseconds after FPCR in T / R-Y mode. The mode logic control produces the logic level of the input mode pulses. The one-shot has two functions: one is to reset the count control and inhibit the 4 MHz reference clock, the other function is to enable the SPC detector.

(2) The converted SPC signal is applied to a SPC detector which clocks the leading edge of the signal into a control gate during the 4 microsecond period the one-shot is triggered. SPC should occur 12 microseconds after FPCR in the A / A-X or T / R-X modes, 24 microseconds after FPCR in the A / A-Y mode. and 36 microseconds after FPCR is the T / R-Y mode. The output of the control gate is supplied to a binary counter directly or through a divide-by-five counter through a SEARCH /TRACK gate. The control gate is enabled by the 1 second gate (OSG). Should the time relationship be correct, the output of the control gate will represent the repetition rate of both FPCR and SPC. The repetition rate of SPC and / or FPCR depends on whether the navigational set is in search or track mode. Normally the repetition rate for search is 147 Hz and 27 Hz for track. The range valid flag control (TRFC) is a logic 1 in track and logic 0 in search, which will enable or by-pass the divide-by-five counter. When the navigational set is in the track mode. the output of the control gate is coupled directly to a binary counter via the SEARCH and TRACK gate. The output of the counter is decoded to produce the first and second pulse status (FSPS) signal. With a count of 22 Hz to 36 Hz, FSPS will be in a GO conditions with a logic 1. In the search mode. the divide-by-five will be in series with a binary counter via the SEARCH and TRACK gate with TRFC being a logic 0. Ail counts monitored by the decoder will be five times greater than in track mode. Therefore, FSPS will be a logic 0 for a GO condition with counts of 110 to 179 Hz. With a count of 180 Hz, the SEARCH and TRACK control will inhibit the control gate and stop the counting.

b. Suppression Pulse Out (SPO) and Power Amplifier Video (PAV) Monitoring Circuitry. The circuitry for the PAV and SPO signals are designed in the same manner as described in the FCSR and SPC monitoring circuitry. Under normal conditions. navigational set peak power output is 1.5 to 4.0 Kw in the T / R mode, and 1 Kw in the A / A mode during self test. The peak power from the navigational set is applied through TACAN RF connector J1 to the power monitor assembly, consisting of a coupler and a 50-ohm termination that supplies a detected power amplifier video (PAV) pulse to this circuit card. The navigational

set also provides a 50 microsecond suppression pulse output (SPO) blanking pulse through SPO connector J4 that starts just before the transmitted pulse pairs and single pulses. The power amplifier video status (PAVS) output is in a GO condition (logic 1) if the detected pulse pairs exceed 20 Hz. are bracketed by SPO, and have an amplitude of 4.5 volts or greater (4.5 volts being an equivalent of 840 watts peak power established by the power monitor circuitry).

c. Frequency Generator Status (FST) Monitoring Circuitry. The FST signal is normally a logic 0 for a GO condition of the frequency synthesizer. However, under normal conditions, $\overline{\text{FST}}$ will have low frequency NO-GO pulses. Should this rate exceed 1 KHz. the monitoring circuitry of FST will provide a NO-GO to the fault precedence circuit card for the frequency synthesizer. $\overline{\text{FST}}$ is converted to TTL level and a logic 0 input will be decoded to produce a logic 1 at the frequency generator status output (FSTS) to indicate a GO condition. Should $\overline{\text{FST}}$ contain ten or more positive pulses during the 10 millisecond gate (TMG) time. a NO-GO will be producted at FSTS. The NO-GO condition will remain until another test cycle is initiated and the counters reset by the $\overline{\text{REST}}$ pulse.

4-11. Signal Processor No. 1 Circuit Card AS

The A5 circuit card processes five output signals from the navigational set decoder module. The card provides six signals which are interfaced with the. fault precedence circuit card for further processing in determining a faulty module in the navigational set. Figure FO-8 is a functional block diagram of circuit card A5.

a. Fine Bearing Modulation (FBT) Monitoring Circuitry. The FBT input signal is normally a 135 Hz sine wave with a peak-to-peak amplitude of 2 volts. The sine wave is converted to a TTL level pulse. provided an 0.5 volt threshold is exceeded, and fed through a control gate where it is NANDED with a 1 second gate (OSG). The output of the control gate clocks a divide-by-ten decade counter whose output is applied to a binary counter The outputs of the binary counter are monitored by a decoder for a count of thirteen. The output of the decoder will be a logic 1 during the binary counter output count of 1 to 12, a logic 0 at a count of thirteen. and a logic 1 at a count of fourteen. The output is inverted to provide the fine bearing modulation status (FBTS) signal. FBTS is logic 0 (NO-GO) when the binary counter is at counts one to twelve (FBT input of 0 to 129 Hz); a logic 1) when at count thirteen (FBT input of 130 to Hz); and a logic 0 (NO-GO) at counts above thirteen (over 140 Hz). Should the count reach sixteen, the counter control is clocked to a set condition to disable the control gate and inhibit further counting.

b. Auxiliary Reference Bursts (ART) Monitoring Circuitry. The ART input is normally a 135 Hz ECL pulse with a 4 microsecond duration. The ECL pulse is converted to a TTL level. The ART monitoring circuitry functions in an identical manner as described for FBT monitoring in a above.

c. Course Bearing Modulation (CBT) Monitoring Circuitry. CBT is normally a 15 Hz sine wave with a peak-to-peak amplitude of 2 volts. The CBT input is converted to a TTL level squarewave, provided an 0.5 volt threshold is exceeded. The TTL level is NANDED and gated by the OSG in the control gate and fed to a binary control. The output of the decoder is course bearing modulation status (CBTS). The output of CBTS is a logic 0 (NO-GO) for input frequency counts of 1 through 11 Hz and a logic 1 (GO) for input frequency counts of 12 through 17 Hz. At an output count of 16 Hz from the binary counter, the counter control is clocked to a set condition and disables the control gate to inhibit the counting at a count of 1.

d. Main Reference Bursts (MRT) Monitoring Circuitry. The MRT input is normally a 15 Hz ECL logic level pulse with a duration of 250 microseconds. MRT is converted to a TTL level. The MRT monitoring circuitry functions in an identical manner as described for CBT in c above.

e. First Pulse Valid (FPV) Monitoring Circuitry. The $\overline{\text{FPV}}$ signal is normally a 1 microsecond negative pulse occurring at a repetition rate Of 27 Or 147 Hz in the A / A mode and 2700 Hz in the T/ R mode. FPV is buffered and converted from an ECL level to a TTL level. In the T / R mode, the converted FPV signals are divided by ten before clocking a binary counter. The output from the binary counter is monitored by a counter control and a decoder. The outputs of the binary counter are combined with the output From the control counter to obtain counts from 16 to 32. The control counter output will be a logic 0 during counts 1 to 16 and 11 logic 1 during counts of 16 to 32. The output of the decoder. first pulse valid status A / G (FPVS A / G) is a logic 0 (NO-GO) for counts 1 to 23 and at count 32. Therefore. the FPVS A / G is GO for FPV frequencies from 2400 to 3199 Hz. In the A / A mode. the converted FPV signal is fed through a control gate. gated by OSG. The output from the control gate is counted by a binary counter whose output is monitored by a counter control and a decoder. When the binary counter reaches an

input count of 20, its output state of four will be detected by the decoder and the decoder output will be low. Through an inverting action, the output of the decoder, first pulse valid status A / A (FPSV A / A) will go high for any count above 20 Hz.

4-12. Range and Bearing Zero Check Circuit Card A6

Circuit card A6 contains logic circuitry necessary to convert ECL range and bearing data to TTL and test the self-test range and bearing indicated by the navigational set. The navigational set self-test module generates a target at zero range and bearing, and this card examines the parallel words (digital computer outputs) and determines whether the computer outputs are within preset tolerances: Range = 0 + 0.4 nm, Bearing = 0 + 2 --4 degrees. Circuit card A6 also verifies the ID tone frequency. Another function of A6 is to convert the parallel ECL digital data logic to TTL logic used in the test set. Figure 4-3 is a functional block diagram of the circuit card.

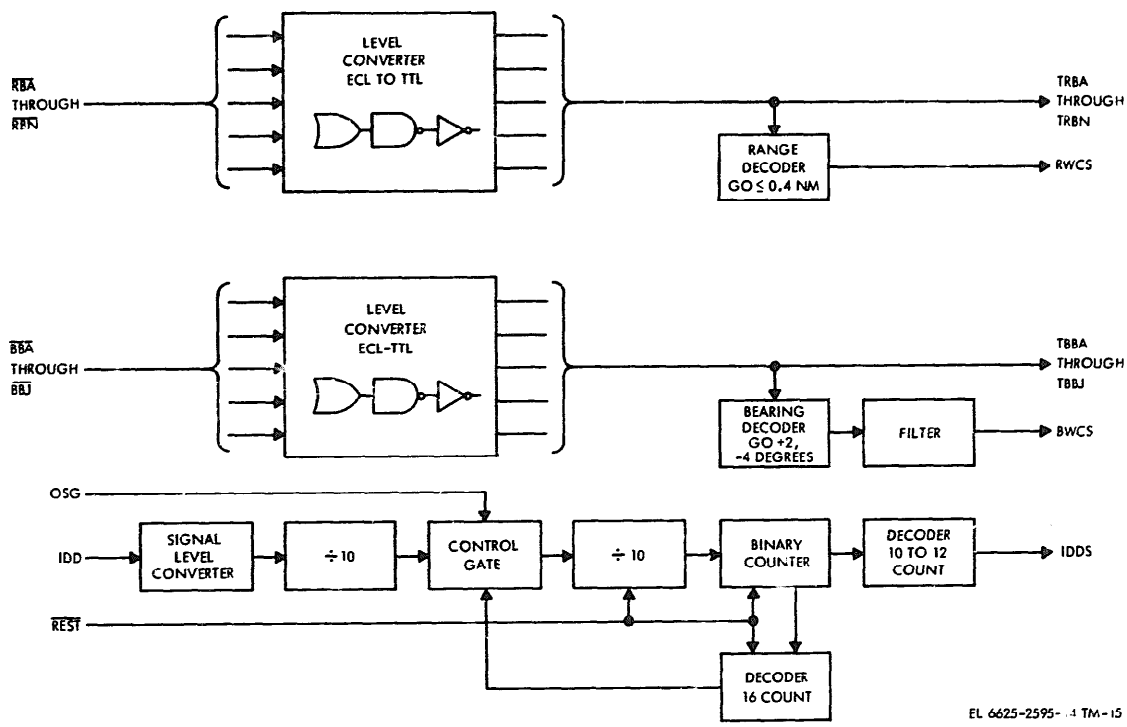

Figure 4-3. Range and bearingzero check circuit card functional block diagram.

a. Range Bits A through N (RBA-RBN) Verification Circuit. All input RBA through RBN are converted from ECL logic levels to TTL levels. The outputs of the level converter are the translated range bits A through N (TRBA-TRBN). The outputs are applied to a range decoder where the range bits are examined by a logic circuit to produce the range word computer status (RWCS) signal., The R WCS is a logic 1 in the GO condition (0 to + 0.4 nm).

b. Bearing Bits A through J (BRA-BRJ) Vertification Circuit. All input bits BBA through BBJ are handled in much the same manner as were the range bits. The only difference is that the bearing word computer status (BWCS) output signal is fed through a filter. The purpose of the filter is to eliminate for 100 microseconds any erroneous data transmitted during update of the bearing computer register. The B WCS is a logic 1 in the GO condition (0 + 2. -4 degrees).

c. ID Tone (IDD) Frequency Verification Circuit. The input 1350 Hz IDD is fed through a

signal level converter into a divide-by-ten counter whose output is applied to a control gate. The OSG gates the signal into another divide-by-ten counter whose output clocks a binary counter. Two outputs from the counter are fed into decoders. One decoder monitors counts 12 to 14 to produce the ID Tone status (IDD) signal. The other decoder monitors the count 16 and applies an output to the control gate to inhibit the counting. IDDS is in the GO condition if the frequency is greater than 1200 Hz and less than 1600 Hz.

4-13. Display Control Circuit Card A7

Circuit card A7 contains the logic circuitry required to control the display multiplexer card (A8) and process the serial data from the control unit, the TACAN serial data train from the navigational set digital interface module to the internal control module. and the range, bearing, and control word output of the digital interface module. This card also contains five stored programs and the serial data generator to simulate the interface data from the ANS-36 inertial navigational computer. The 4 MHz crystal oscillator, the source of all the clocks and the time bases used in the system, is located on this card. Figure FO-9 is a functional block diagram of the circuit card.

a. Master Clock Generator. A 4 MHz crystal oscillator generates the master timing for all the clocks used in the test set. One of the two oscillator outputs is applied to a divide-by-four counter to produce a 1 MHz signal. This signal is applied to a divide-by-two flip-flop (producing 500 kHz) and applied to a 25% duty cycle generator. The 25% duty cycle generator produces 500 nanosecond pulses at a 500 kHz rate. These pulses, CSC and CSC. are provided for use by the navigational set interface module. Another output of the divide-by-four counter is applied to a divide-by-1000 to produce the 1 kHz clock. The 100 Hz and 10 Hz clocks are produced in a similar manner from two additional divide-by-10 counters. The other 4 MHz oscillator output is used in the signal processor No. 2 card, 1A4.

b. Control Unit Word Display Circuitry. The serial data output (CUW) from the control unit is a 0 to + 28 vdc level pulse train that is changed to a TTL level by a buffer / inverter. When the control unit word is selected for display, the DCUW input line goes to a logic 0 to enable control gate one, which allows the CUW to be fed into the multiplexer. The translated CUW then appears on the translated serial data (TSDT) output from the multiplexer and is fed into the serial data register on the display multiplexer card. Whenever the control unit word is selected for display, a serial data clock (SDTC) is derived from the 26 vac 400 Hz iuput to the display control card. The 26 vac is buffered and inverted to provide a 400 Hz TTL pulse that is fed through control gate (2) to produce the serial data clock (SDTC) and the serial data register on multiplexer display card (A8). The DCUW signal is also fed to control gate (3) to provide the displayed serial word mode to the display multiplexer card.

c. Serial Data Train Display Circuitry. The serial data train (SDT) output from the navigational set interface module is a 0 to 28 vdc level pulse train that is changed to a TTL level by a buffer / inverter. When the serial data word is selected for display, the DSDT input line goes to a logic 0 to enable control gate four and SDT is fed in to a multiplexer and appears on the translated serial data (TSDT) output. The TSDT is then fed into the serial data register on display multiplexer card A8. The clock for the register is the same as described in b above. DSDT is also gated by control gate three to provide the display serial word mode (DSWM) signal to the display multiplexer card.

d. Display Memory Circuitry. When the control unit word or serial data train is being displayed, the memory display control card generates a display ($\overline{\text{DMRY}}$) parallel transfer signal by monitoring the position of the serial word in the serial to parallel register in the display multiplexer circuit card. The monitoring of the position is through SYNC A, B, and C (SYA-SYC) output signals from the register. These signals correspond to bits 1, 13 and 14. The bits are fed through the word location detector. When the 14th bit is detected, indicating that word is in the register. the 320 microsecond one-shot gate generator is fired enabling control gate five to provide the $\overline{\text{DMRY}}$ input to the register and allow the transfer of the data into the memory register in the display multiplexer card. When the display control card is operating in the digital interface mode, control gate six on the input to the 320 microsecond one-shot transfers the triggering of the one-shot to the output of the state 14 decoder so that $\overline{\text{DMRY}}$ occurs just after each shift of the computer word.

e. TACAN to Computer Data Circuitry. Under normal operating conditions, range. bearing, and control word data is requested from the navigational set by the computer. However. during testing of the navigational set, the test set generates the data request line signals. provides the clocks, and displays the received information. For example. if the range word is to be displayed on the test set. the DISPLAY SELECT switch is set in the DIGITAL INTERFACE position and the FUNCTION SELECT switch is set in the

RANGE position. For display of the digital interface bearing or control word, the FUNCTION SELECT switch would be set in the appropriate position.

f. Serial Data Request Line Circuitry. The serial data request lines SDRA and SDRB are initially at logic 0. To request the navigational set for computer data, one or both of the DRA or DRB lines is forced high and gated through control gate by a 10 Hz clock. The coding of the DRA and DRB lines is as fo1lows:

	DRA	DRB
Control	0	1
Bearing	1	0
Range	1	1

After the appropriate data is requested and is valid, the test set receives a logic 1 on DTV which causes the lamp driver for the DATA VALID lamp to illuminate the lamp. The DTV signal also enables control gate eight to allow the 4 MHz to pass through the two, divide-by-two counters and the sync duty cycle generator to produce the input shift clock (ISC). The ISC signal clocks the interface register in the navigational set. The ISC is also selected by control gate two and shifts the input data into the serial data register on the display multiplexer card. The ISC signal is counted and a reset signal is developed by the decoder after 14 ISC clock pulses. This reset signal resets the data word sync control logic and the data transfer cycle is complete. This cycle repeats itself ten times a second unless the display update hold (DUH) signal is low causing control gate nine to inhibit the 10 Hz clock from reaching the data word sync control logic. The output of the decoder also triggers the 320 microsecond gate generator which produced DMRY after the 14th pulse count. During the operation of the test set in the digital interface mode, the serial data output of the TACAN interface (TAD) is applied to the TSDT output of this card by the action of control gate ten and the multiplexer.

g. Programmed Control Word (PRGA Through PRGE). The programmed control word, which simulates computer control of the navigational set is stored in a register. The register is a parallel load, serial shift configuration with discrete input signals (PRGA through PRGE) controlling the parallel data. The inputs are a logic 0 when selected by the PROGRAM SELECT switch. Programs 1 through 4 contain valid addresses and position 5 contains an invalid address. The input to the register must be a logic 0 when parallel loading, and a logic 1 when serial shifting. The register will serial shift on the positive leading edge of the CLK input. The clock for the program register is either a 500 K Hz or 250 KHz, with a 25% duty cycle. The following is the program selection logic for the control word.

Program Select	Mode				Channel Select									Address				Program Summary
	S / T	A / A	R / T	REC	100	80	40	20	10	8	4	2	1					
PROGRAM 1	0	0	0	1	0	0	1	1	1	0	1	1	1	0	1	0	0	REC. CH 77
PROGRAM 2	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	R / T. CH 88
PROGRAM 3	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	A / A. CH 108
PROGRAM 4	1	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	R / T.S / T. CH 83
PROGRAM 5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	REC. CH 80 WRONG ADDRESS

‘IO enter a programmed control word into the navigational set from the test set, the control unit is set to the AUTO mode, PROGRAM SELECT is set in position 1 to 5, and the ENTER switch on the test set is pressed and then released. The AUTO mode is required because the digital interface module will reject all computer address words in all modes except AUTO. With the ENTER switch pressed. the switch enter (SENT) discrete input is logic 0. and SENT a logic 1. This condition sets the RS flip-flop. used as a bounceless switch, to apply a clock to the clock control and enable the program register. The clock control output allows the clock counter control to be clocked by a 1 MHz. 25% duty clock that enables the clocking of a decade counter at a rate of 500 KHz through clock control gate eleven. Transfer of the clock through the gates is from the set condition of the counter control and divide-by-two counter. The clock for the decade counter also clocks the program register which is now in the SHIFT state. At the count of four the divide-by-two is clocked and the count continues at a 2.50 kHz rate until at a second count of eight, the output of the counter control is activated and the count is stopped until the ENTER switch is pressed again. The output of the register is the input data

line (IDL). The clock generating circuitry has a dual function, one is to provide the clock frequency change and the other is to provide the data input command 4 (IDC) signal.

4-14. Display Multiplexer Circuit Card A8

Circuit card A8 contains the necessary circuitry to select and display the desired parallel digital data on the front panel of the test set. These include the range word, bearing word, and the parallel control word (output of the navigational set internal control module 1. This card also contains a 16 bit serial-to-parallel register which transfers all TACAN serial data into the 15 bit display memory register. This serial data includes interface module output data (range, bearing, and control word) to the AN / ASN-86, the interface output control word to the internal control module, and the output control word from the control unit. Figure 4-4 is a functional block diagram of the circuit card.

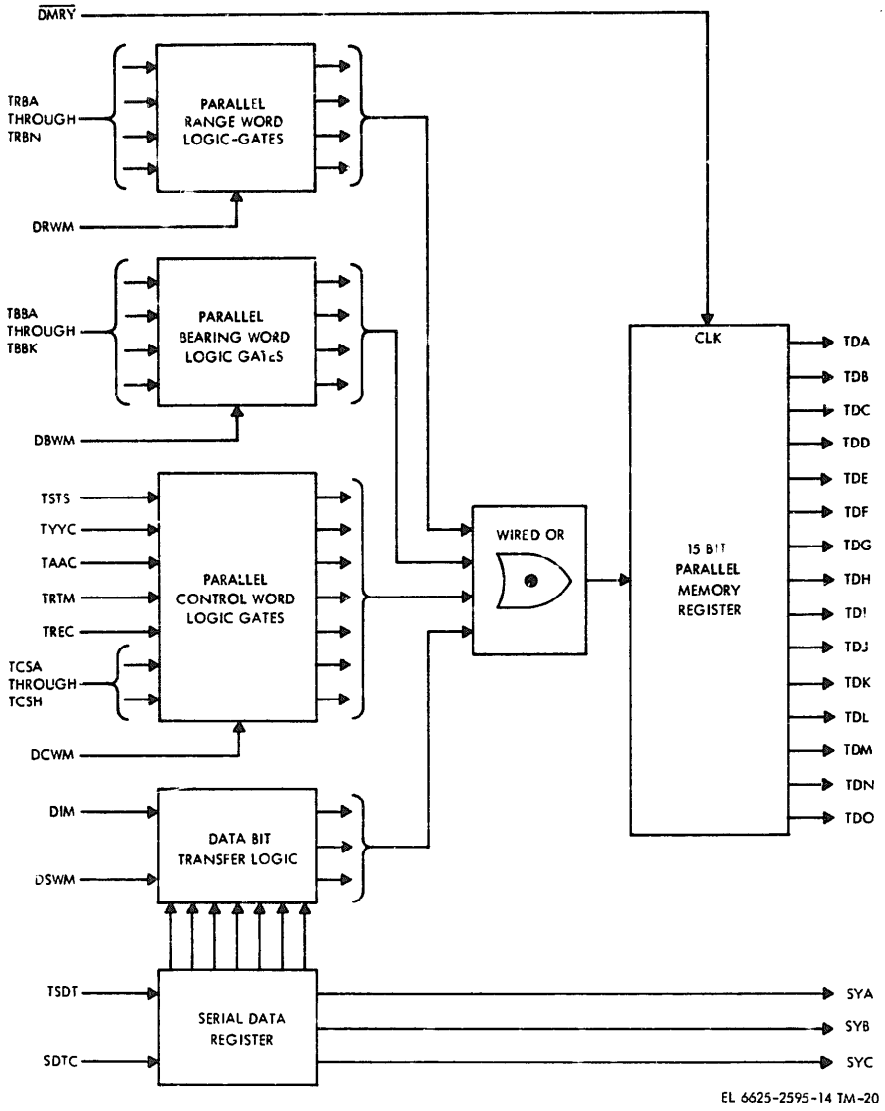

Figure 4-4. Display multiplexer circuit card functional block diagram.

a. Parallel Range Word. The logic gates for the 14 bits of parallel range word (TRBA-TRBN) form an OR configuration with the parallel bearing and control word logic gates. When the DISPLAY SELECT switch is set in the RANGE position, a logic 0 discrete signal (DRWM) loads the range data into the 15 bit memory register. The register is continuously clocked by a logic 0 on the DMRY line.

b. Parallel Bearing Word. The logic gates for the 11 bits of parallel bearing word (TBBA-TBBK) form an OR configuration with the range and control word logic gates. When the DISPLAY SELECT switch is set in the BEARING position, a logic 0 discrete signal (DBWM) loads the data into the 15 bit memory register. The register is continuously clocked by a logic 0 on the DMRY line.

c. Parallel Control Word. The logic gates for the 13 bits of parallel control word (TSTC, TAAC, TRTM, TREC, TYYC, and TCSA-TCSH) form an OR configuration with the parallel range and bearing logic dates. When the DISPLAY SELECT switch is set in the CONTROL WORD position, a logic 0 discrete signal (DCWM) loads the date into the 1.5 bit memory register. The register is continuously clocked by a logic 0 on the DMRY line.

d. Serial Control Word. The serial control word input (TSDT) and the serial data clock (SDTC). generated in and controlled by the display control circuit card, are transferred into the serial-to-parallel register at clock rates of 400 Hz and 1 MHz. The data consists of a control word used by the navigational set internally and the control word sent to the computer. The serial-to-parallel register is updated at a 10 Hz rate for the computer data and at 14.2 Hz rate for the internal navigational set data. The output of the register is fed into the data bit transfer logic gates that form an OP -on-figuration. Since the format and frequency of the serial word is different, two gate control signals are required to load the data into the 15 bit memory register. When the DISPLAY SELECT switch is set in the CONTROL UNIT or SERIAL DATA positions, a logic 0 on discrete signal (DSWM) loads the navigational set internal data into the memory register. When the DISPLAY SELECT switch is in the DIGITAL INTERFACE position, a logic 0 on discrete signal (DIM) loads the navigational set output to computer data into the memory register. The logic gate input from the serial-to-parallel register is arranged so that the data bit transfer location is consistent with the allocated bit position in the memory register. Three outputs, SYNC A, B, and C (SYA-SYC) from the serial-to-parallel register are fed back to the display control circuit card and generate the memory clock (DMRY) which is used to clock the SDT, control unit word (CUW), and computer word into the 15 bit memory register into the display driver circuits in the display drive No. 1 circuit card.

Q-IS. Display Drive No. 1 Circuit Card A9

Circuit card A9 provides lamp drivers for the 15 bit display lamps, DATA VALID and AUTO lamps, ANT SWITCH, and ANT DRIVE lamps. The circuit card also provides for a function test of all the lamp drivers and the lamps on the front panel driven by the card. Figure 4-5 is a function block diagram of circuit card A9.

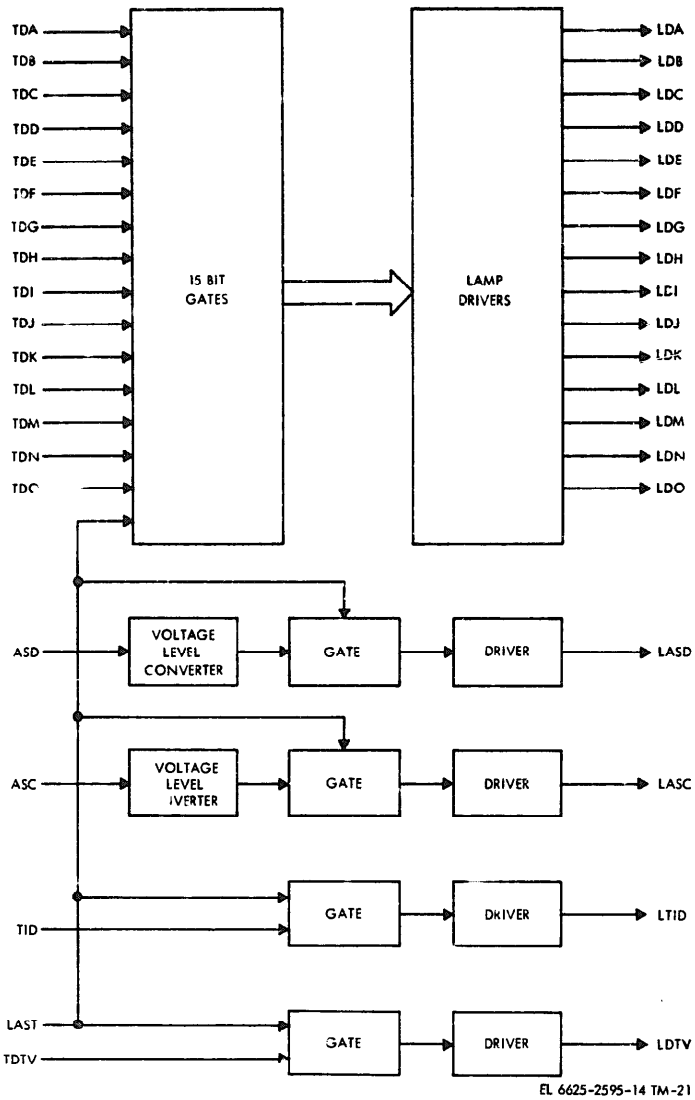

Figure 4-5. Display drive No. I circuit card functional block diagram.

a. 15 BIT Display Lamps. A 1 logic 0 input to any one of the 15 BIT display lamp circuits (TDA through TDO) provides a logic 1 output to the associated driver. The output driver transistor is saturated to provide the drive signal (LDA through LDO) to illuminate the display lamp on the front panel.

b. DATA VALID Lamp. The input data valid signal (TDTV) is a logic 0. The signal is processed in the same manner as described in a above. The output signal from the driver (LDTV) illuminates the DATA VALID lamp.

c. AUTO Lamp. When in the AUTO mode of operation. the input signal from the interfcce module (TID) is a logic 0. The signal is processed in the same manner as in a above. The output signal (LTID) illuminates the AUTO lamp.

d. ANT DRIVE Lamp. The input signal (ASD) is a 0 to + 28 vdc logic signal. When the input is 0 vdc, the signal is converted to a logic 0, the low level input is applied to a gate to produce a high level output to force the driver to saturation and illuminate the lamp. When the input signal is + 28 vdc. the driver is cut off and the lamp is turned off.

e. ANT SWITCH Lamp. The input signal (ASC) is either open or + 28 vdc. A high input (+ 28 vdc) is converted to a logic 0 and applied through a gate. The output is a logic 1 which forces

the driver to saturation and illuminates the lamp. When the input is low or open, the drivers are shut off and the lamp is turned off.

f. Lamp Test. When the TEST INITIATE switch is pressed and held, a ground is applied to the lamp A self-test (LAST) signal. A logic 0 input signal is then applied to all the gates. The high output of the gates drives the output driver transistors to saturation, therby illuminating all the lamps associated with circuit card A9.

g. Lamp Turn-On Current. A continuous 3 ma of current is applied to each of the display lamps to prevent damage to the lamps from suddent current surges when lamps are turned on.

4-16. Display Drive No. 2 Circuit Card A10

Circuit card A 10 provides lamp drivers for the 11 module fault lamps, TEST SET NO-GO lamp, TEST INITIATE lamp, RANGE VALID lamp, BEARING VALID lamp, RANGE FLAG DRIVE lamp, and the BEARING FLAG DRIVE lamp. A lamp test function is also provided for on the circuit card to test all the lamp drivers and the lamps. Figure 4-6 is a functional block diagram of the circuit card.

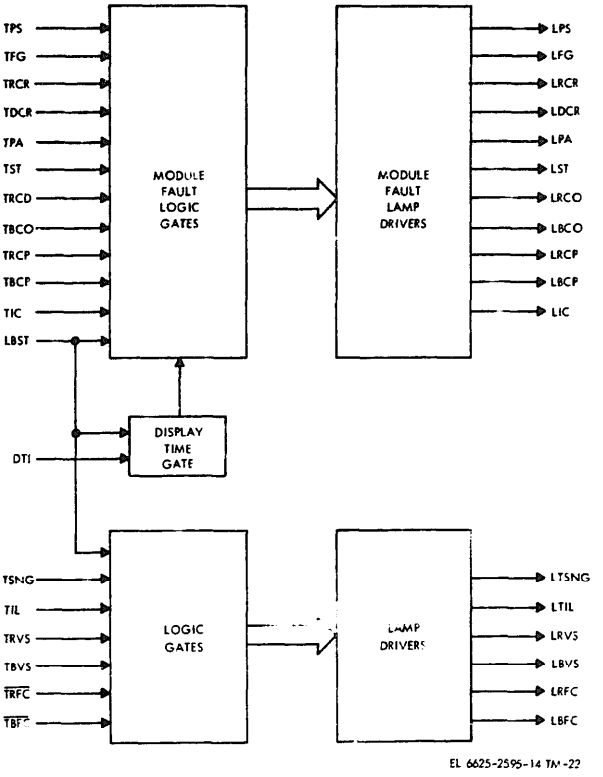

Figure 4-6. Display drive No. 2 circuit card A10 functional block diagram.

a. 11 BIT Module Fault Display Lamps. A logic 0 input to any one of the module fault display circuits is inverted and ANDed with a 10-second display time (DTI) gate, originating in the test sequence circuit card (A1) to provide an output logic 1 to the associated lamp driver. The output driver transistor is saturated to provide an output signal that illuminates the display lamp on the front panel.

b. TEST SET NO-GO. RANGE and BEARING VALID, and RANGE BEARING FLAG DRIVE Lamps. If any one of the input signals is a logic 0. the signal provides a logic 1 output that causes the associated driver to saturate to illuminate the lamp on the front panel.

c. TEST INITIATE Switch Lamp. When the TEST INITIATE is pressed, a logic 0 input to lamp B self test (LBST) provides a logic 1 input to all lamp drivers. The driver is saturated and all lamps in the switch are illuminated. As long as the switch is pressed, LBST input is grounded. When the TEST INITIATE switch is released, test initiate lamp (TIL) is a logic 1 for 32 seconds and the TEST INITIATE switch lamps are not illuminated for this period. A 3 ma of current is applied to the lamps to prevent sudden surges from damaging the lamps when they are illumineted.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

NOTE
No direct support maintenance is required for the test set.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. GENERAL SUPPORT TROUBLESHOOTING

6-1. Scope

This chapter contains instructions for troubleshooting, inspection, and performance verification of the test set. Removal and replacement of assemblies. plug-in circuit cards, and specific component parts are included. Maintenance functions beyond the scope of general support level maintenance shall be referred to depot level maintenance.

a. Voltage and Resistance Measurements.

(1) Voltage Measurements. This equipment is transistorized. When measuring voltages, use tape or sleeving (spaghetti) to insulate the entire test probe except for the extreme tip. A momentary short circuit can damage one or more transistors. Use the same or equivalent test equipment specified in the test procedure.

(2) Resistance Measurement. Make resistance measurements in this equipment as directed in the troubleshooting procedures. Use the ohmmeter range specified; otherwise the reading will be inaccurate.

CAUTION

Before using an ohmmeter to test transistors or transistor circuits, check the open-circuit voltage across the ohmmeter test leads. Do not use the ohmmeter if the open-circuit voltage exceeds 1.5 volts. Also since the Rx1 range normally connects the ohmmeter internal battery directly across the test leads, the comparatively high current (50 ma or morel may damage the transistor under test. As a general rule it is not recommended that the Rx1 range of an ohmmeter be used when testing low power transistors. Make resistance measurements in this equipment only as directed. otherwise indications obtained may be inaccurate.

b. Waveform Analysis. Many of the circuits in the test set use signals that are difficult or impossible to analyze with a voltmeter. For these circuits, the use of an oscilloscope or frequency counter is specified. The oscilloscope or frequency counter display is used as the indication of circuit operation. Resistance measurements may be required to support the waveform observed.

c. Test Points. Test points used on this equipment consist mainly of a test point board or connections on the test panel. Other test points are connector pins on the circuit cards and are identified on the schematics or parts location diagrams. Tables 6-1 through 6-3 list the signals available at test points on circuit cards, test point strips, and front panel connectors.

d. Intermittent Troubles. In all of the tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble often may be made to appear by tapping or jarring the equipment. Make a visual inspection of the wiring and connections to the units of the navigationat set. Minute cracks in printed circuit boards can cause intermittent operation. A magnifying glass is often helpful in locating defects in printed boards. Continuity measurements of printed conductors may be made using the same technique originally used on hidden conventional wiring; observe ohmmeter precautions discussed in a above.

e. Resistor and Capacitor Color Code Diagram. The resistor and capacitor color code diagram (fig.. FO-1) is provided to aid maintenance personnel in determining the value, voltage rating, and tolerance of resistors and capacitors.

Table 6-1. Navigational Set Signal Locations on Test Panel

TEST POINT SELECTORS Switches		*Navigational Set Signal Term*	*Navigational Set AGE Pin No. or J2*
A	*B*		
1	1	$\overline{\text{RBA}}$	46
1	2	$\overline{\text{RBB}}$	58
1	3	$\overline{\text{RBC}}$	23
1	4	$\overline{\text{RBD}}$	3
1	5	$\overline{\text{RBE}}$	40
1	6	$\overline{\text{RBF}}$	13
1	7	$\overline{\text{RBG}}$	70
1	8	$\overline{\text{RBH}}$	95
1	9	$\overline{\text{RBI}}$	2
1	10	$\overline{\text{RBJ}}$	28
1	11	$\overline{\text{RBK}}$	10
1	12	$\overline{\text{RBL}}$	81
2	1	$\overline{\text{RBM}}$	190

Table 6-1. Navigational Set Signal Locations on Test Panel-Continued

TEST POINT SELECTORS Switches A	B	Navigational Set Signal Term	Navigational Set AGE Pin No. or J2
2	2	$\overline{\text{RBN}}$	76
2	3	RVC	34
2	4	RSM	14
2	5	FPCR	64
2	6	SPC	88
2	7	ELT	111
2	8	$\overline{\text{PIT}}$	128
2	9	$\overline{\text{BBA}}$	20
2	10	$\overline{\text{BBB}}$	21
2	11	$\overline{\text{BBC}}$	44
2	12	$\overline{\text{BBD}}$	32
3	1	$\overline{\text{BBE}}$	5
3	2	$\overline{\text{BBF}}$	11
3	3	$\overline{\text{BBG}}$	17
3	4	$\overline{\text{BBH}}$	1
3	5	$\overline{\text{BBI}}$	114
3	6	$\overline{\text{BBJ}}$	80
3	7	BBK	68
3	8	BLT	56
3	9	BOT	92
3	10	AVT	12
3	11	BVS	104
3	12	$\overline{\text{BVC}}$	121
4	1	$\overline{\text{CSH}}$	113
4	2	$\overline{\text{CSG}}$	101
4	3	$\overline{\text{CSF}}$	89
4	4	$\overline{\text{CSE}}$	112
4	5	$\overline{\text{CSD}}$	90
4	6	$\overline{\text{CSC}}$	66
4	7	$\overline{\text{CSB}}$	78
4	8	$\overline{\text{CSA}}$	102
4	9	$\overline{\text{AAC}}$	6
4	10	$\overline{\text{RTM}}$	9
4	11	$\overline{\text{YYC}}$	7
4	12	STC	42
5	1	ASD	54
5	2	TSC	19
5	3	$\overline{\text{FSC}}$	18
5	4	$\overline{\text{PTT}}$	4
5	5	CUS	30
5	6	SDT	37
5	7	CVT	57
5	8	MRT	96
5	9	CBT	33
5	10	ART	24
5	11	FBT	93
5	12	SGT	69
6	1	$\overline{\text{FGT}}$	45
6	2	$\overline{\text{FPV}}$	106
6	3	FPCD	53
6	4	IDD	48
6	5	NC	
6	6	$\overline{\text{FST}}$	77
6	7	$\overline{\text{RST}}$	125
6	8	$\overline{\text{RZT}}$	79
6	9	$\overline{\text{BZT}}$	67
6	10	STS	103
6	11	STH	127
6	12	FPC	91
7	1	HFCA	15
7	2	$\overline{\text{HFCA}}$	25
7	3	$\overline{\text{PSS}}$	94
7	4	+5.2V	122
7	5	−5.2V	43
7	6	+12V	55
7	7	−12V	126
7	8	−10V	71
7	9	+30V	123
7	10	HVT	105
7	11	FHC	82
7	12	PHC	38

Table 6-2. Test Signal Locations on Test Panel

TEST POINT SELECTOR Switches A	B	Test Set Signal Term	Circuit Card Location or J2
8	1	OSG	XA1 P2-3
8	2	MRY	XA1 P2-1
8	3	RST	XA1 P2-5
8	4	OSR	XA1 P2-10
8	5	TPS	XA2 P1-34
8	6	TFG	XA2 P1-42
8	7	TST	XA2 P1-41
8	8	TIC	XA2 P1-40
8	9	TDCR	XA2 P1-33
8	10	TRCR	XA2 P1-32
8	11	TRCO	XA2 P1-31
8	12	TBCO	XA2 P1-9
9	1	TBCP	XA2 P1-10
9	2	TRCP	XA2 P1-13
9	3	TPA	XA2 P1-12
9	4	HFCS	XA2 P1-39
9	5	RVRS	XA3 P2-4
9	6	NC	
9	7	SGHS	XA3 P2-42
9	8	SGBS	XA3 P2-41
9	9	SGAS	XA3 P2-18
9	10	SGCS	XA3 P2-39
9	11	PTTS	XA3 P2-38
9	12	FGTS	XA3 P2-15
10	1	FSPS	XA4 P2-7
10	2	FSTS	XA4 P1-16
10	3	PAVS	XA4 P1-15
10	4	CBTS	XA5 P1-14
10	5	ARTS	XA5 P1-43
10	6	FBTS	XA5 P1-44
10	7	NC	
10	8	MRTS	XA5 P1-33
10	9	FPVS A / A	XA5 P2-19
10	10	FPVS A / G	XA5 P1-9
10	11	RWCS	XA6 P1-33
10	12	BWCS	XA6 P2-9
11	1	IDDS	XA6 P2-10
11	2	IDL	XA7 P1-10
11	3	DTV	XA7 P2-11
11	4	ISC	XA7 P2-10
11	5	CUW	XA7 P2-5

Table 6-2. Test Set Signal Locations on ions on Test Panel-Continued

TEST POINT SELECTOR Switches A	B	Test Set Signal Term	Circuit Card Location or J2
11	6	CSC	XA7 P1-41
11	7	TAP	XA7 P2-21
11	8	IDC	XA7 P1-20
11	9	TSDT	XA8 P1-39
11	10	SDTC	XA8 P2-24
11	11	DMRY	XA8 P1-12
11	12	DTI	XA10P1-11
12	1	BFC	XA3 P2-36
12	2	RFC	XA3 P2-37
12	3	TMG	XA4 P1-17
12	4	SENT	XA7 P1-40
12	5	ASC	XA9 P1-22
12	6	SMS	NC K1-2
12	7	NC	NC
12	8	NC	NC
12	9	NC	NC
12	10	NC	NC
12	11	NC	NC
12	12	NC	NC

TEST POINT SELECTORS Switches C	Test Set Signal Term	Circuit Card Location (or other source) or J3
1	SPO	J4-1
2	IDC	XA7P1-20
3	ISC	XA7P2-10
4	CSC	XA7P1-41
5	DRA	XA7P2-23
6	DRB	XA7P2-24
7	SYA	XA8P1-31
8	REST	XA6P2-11
9	OSG	XA6P1-11
10	MRY	XA2P1-43
11	FPC	S1L-6
12	SPC	XA4P2-9

Table 6-3. Test Set Signal Locations on Chassis Assembly

Circuit Card Test Point Strip	Test Set Signal Term	Circuit Card Test Point Strip	Test Set Signal Term
TPA— 1	TRBA	TPC— 1	TFPCR
— 2	TRBB	— 2	TSPC
— 3	TRBC	— 3	TSPO
— 4	TRBD	— 4	TPAV
— 5	TRBE	— 5	TCSA
— 6	TRBF	— 6	TCSB
— 7	TRBG	— 7	TCSC
— 8	TRBH	— 8	TCSD
— 9	TRBI	— 9	TCSE
—10	TRBJ	—10	TCSF
—11	TRBK	—11	TCSG
—12	TRBL	—12	TCSH
—13	TRBM	—13	TPSS
—14	TRBN	—14	TRVC
—15	TBBA	—15	TRSM
—16	TBBB	—16	TRST
—17	TBBC	—17	TBFC
—18	TBBD	—18	TRFC

Table 6-3. Test Set Signal Locations on Chassis Assembly -Continued

Circuit Card Test Point Strip	Test Set Signal Term	Circuit Card Test Point Strip	Test Set Signal Term
TPB— 1	TBBE	TPD— 1	TREC
— 2	TBBF	— 2	TRTM
— 3	TBBG	— 3	TAAC
— 4	TBBH	— 4	TYYC
— 5	TBBI	— 5	TSTC
— 6	TBBJ	— 6	TBFC
— 7	TBBK	— 7	TRFC
— 8	DRWM	— 8	TAVT
— 9	DBWM	— 9	TBVC
—10	DCWM	—10	TBVS
—11	DIM	—11	TPTA
—12	DSWM	—12	PTPB
—13	NC	—13	SGAS
—14	NC	—14	SGBS
—15	NC	—15	SGCS
—16	NC	—16	PTTS
—17	NC	—17	FGTS
—18	TFPV	—18	FSPS

6-2. Tools and Test Equipment Required

All the equipment required for general support maintenance of the test set, as authorized by the Maintenance Allocation Chart, Appendix B, is listed below :

a. Tools.

Nomenclature	Common Name
Tool Kit, Electronic Equipment TK-100/G	TK-100/G
Tool Kit, Electronic Equipment TK-101/G	TK-101/G

b. Test Equipment.

Nomenclature	Common name
Oscilloscope AN/USM-281A	Oscilloscope
Generator, Signal SG-321/U	Function generator
Multimeter ME-26D/U	Multimeter
Data Pulse, Pulse Generator 110B	Pulse generator
Connector, BNC "T" (2 each)	BNC T connector
Connector, BNC "T" with 50 ohm termination	BNC T-50 Ω connector
Connector, Adapter, BNC to CON HEX	Conhex BNC connector
Headset H-104/G	Headset
Counter, Electronic, Digital Readout AN/USM-207A	Counter

6-3. General

The general support troubleshooting procedures in this section supplement those procedures in the organizational level maintenance chapter in this manual, chapter 3. Systematic troubleshooting begins with the sectionalization checks where the fault is traced to a major unit of the test set; test panel, adapter, or test cable. Troubleshooting at the

general support level uses those procedures which localize and isolate the malfunction to an assembly, plug-in circuit card, or a specific component.

a. Sectionalization. The operational tests and associated preventive maintenance tables in chapter 3 provide tests for sectionalizing a fault to a major unit of the test set.

b. Localization. After the trouble has been sectionalized. the malfunction is then localized through visual inspection, continuity checks, or through the electrical tests provided in section V.

c. Isolation. The isolation of a malfunction in the adapter or a test cable consists of tracing the trouble to a faulty connector or a broken wire. Isolation of a malfunction in the test panel consists of checking input and output voltages and signals and isolating the problem to an assembly or plug-in circuit card.

6-4. Adapter Troubleshooting

The troubleshooting of the adapter consists of visual inspection and continuity checks. The following procedures are also performed as part of the semi-annual periodic check referred to the genera1 support maintenance level from organizational maintenance.

a. Visual Inspection. Visually inspect the adapter for broken connectors or bent pins. If any defects are found. refer the unit to depot level maintenance.

b. Continuity Checks. Refer to figure FO-10 and perform continuity checks on the adapter as follows :

(1) Set ohmmeter to Rx1 scale.

(2) Observe a reading of 2 ohms or less at each check.

(3) If correct readings are not obtained, refer adapter to depot level maintenance.

6-5. Test Set Cables Troubleshooting

The troubleshooting of the test set cable assemblies consists of visual inspections and continuity checks. The following procedures are also performed as part of the semiannual periodic check referred to general support maintenance from organizational maintenance.

a. Visual Inspection. Visually inspect the cables for broken connectors, pins, frayed wiring, or worn insulation. If any defects are found, refer the faulty cable to depot level maintenance.

b. Continuity Checks. Refer to table 6-4 and perform continuity checks on cables as follows:

(1) Set ohmmeter to Rx1 range.

(2) Observe a reading of less than 2 ohms or 1ess at each check.

(3) If correct readings are not obtained, refer cable to depot level maintenance.

Table 6-4. Test Set Cables Resistance Chart

RF Antenna Cable W-1

From Pin	To Pin	Resistance
J1-1	J1029-1	Less than 2 ohms

SPO Cable W-2

From Pin	To Pin	Resistance
P1-1	P2-1	Less than 2 ohms

TACAN AGE Cable W-3

From Pin	To Pin	Resistance
P1-1	P2-1	Less than 2 ohms at each check.
P1-2	P2-2	
P1-3	P2-3	
P1-4	P2-4	
P1-5	P2-5	
P1-6	P2-6	
P1-7	P2-7	
P1-8	P2-8	
P1-9	P2-9	
P1-10	P2-10	
P1-11	P2-11	
P1-12	P2-12	
P1-13	P2-13	
P1-14	P2-14	
P1-15	P2-15	
P1-16	P2-16	
P1-17	P2-17	
P1-18	P2-18	Less than 2 ohms at each check.
P1-19	P2-19	
P1-20	P2-20	
P1-21	P2-21	
P1-22	P2-22	
P1-23	P2-23	
P1-24	No Contact	
P1-25	P2-25	
P1-26	P2-26	
(Shield)	P2-25	
	P2-15	
P1-27	No Contact	
P1-28	P2-28	
P1-29	No Contact	
P1-30	P2-30	
P1-31	No Contact	
P1-32	P2-32	
P1-33	P2-33	

Table 6-4. Test Set Cables Resistance Chart-Continued

TACAN AGE Cable W-3—Continued

From Pin	To Pin	Resistance	From Pin	To Pin	Resistance
P1-34	P2-34	Less than 2 ohms at each check.	P1-80	P2-80	Less than 2 ohms at each check.
P1-35	No Contact		P1-81	P2-81	
P1-36	P2-36		P1-82	P2-82	
P1-37	P2-37		P1-83	No Contact	
P1-38	P2-38		P1-84	P2-84	
P1-39	No Contact		P1-85	No Contact	
P1-40	P2-40		P1-86	No Contact	
P1-41	No Contact		P1-87	No Contact	
P1-42	P2-42		P1-88	P2-88	
P1-43	P2-43		P1-89	P2-89	
P1-44	P2-44		P1-90	P2-90	
P1-45	P2-45		P1-91	P2-91	
P1-46	P2-46		P1-92	P2-92	
P1-47	No Contact		P1-93	P2-93	
P1-48	P2-48		P1-94	P2-94	
P1-49	P2-49		P1-95	P2-95	
(Shield)	P2-37		P1-96	P2-96	
P1-50	P2-50		P1-97	No Contact	
(Shield)	P2-38		P1-98	No Contact	
P1-51	No Contact		P1-99	No Contact	
P1-52	No Contact		P1-100	P2-100	
P1-53	P2-53		P1-101	P2-101	
P1-54	P2-54		P1-102	P2-102	
P1-55	P2-55		P1-103	P2-103	
P1-56	P2-56		P1-104	P2-104	
P1-57	P2-57		P1-105	P2-105	
P1-58	P2-58		P1-106	P2-106	
P1-59	P2-59		P1-107	No Contact	
(Shield)	P2-48		P1-108	No Contact	
P1-60	No Contact		P1-109	No Contact	
P1-61	No Contact		P1-110	No Contact	
P1-62	No Contact		P1-111	P2-111	
P1-63	No Contact		P1-112	P2-112	
P1-64	P2-64		P1-113	P2-113	
P1-65	P2-65		P1-114	P2-114	
P1-66	P2-66		P1-115	No Contact	
P1-67	P2-67		P1-116	No Contact	
P1-68	P2-68		P1-117	No Contact	
P1-69	P2-69		P1-118	No Contact	
P1-70	P2-70		P1-119	No Contact	
P1-71	P2-71		P1-120	No Contact	
P1-72	No Contact		P1-121	P2-121	
P1-73	No Contact		P1-122	P2-122	
P1-74	No Contact		P1-123	P2-123	
P1-75	No Contact		P1-124	P2-124	
P1-76	P2-76		P1-125	P2-125	
P1-77	P2-77		P1-126	P2-126	
P1-78	P2-78		P1-127	P2-127	
P1-79	P2-79		P1-128	P2-128	

Table 6-4. Teat Set Cables Resistance Chart-Continued

Computer Signal Cable W-4

From Pin	To Pin	Resistance	From Pin	To Pin	Resistance
P1-A	P2-A	Less than 2 ohms at each check.	P1-H	P2-H	Less than 2 ohms at each check.
P1-B	P2-B		P1-J	P2-J	
P1-C	P2-C		P1-K	P2-K	
P1-D	P2-D		P1-L	P2-L	
P1-E	P2-E		P1-M	P2-M	
P1-F	P2-F		P1-N	P2-N	
P1-G	P2-G		P1-P	P2-P	
P1-S	P2-S		P1-R	P2-R	

TACAN Power Cable W-5

From Pin	To Pin	Resistance	From Pin	To Pin	Resistance
P1-W	P2-A	Less than 2 ohms at each check.	P1-i	P4-D	Less than 2 ohms at each check.
P1-A	P2-B		P1-R	P4-E	
P1-X	P2-D		P1-BB	P4-F	
P1-B	P2-E		P1-g	P4-G	
P1-C	P2-F		P1-H	P4-H	
P1-q	P3-A		P1-x	P4-J	
P1-G	P3-B		P1-GG	P4-K	
P1-H	P3-C		P1-HH	P4-L	
P1-c	P3-D		P1-FF	P4-M	
P1-E	P3-E		P1-EE	P4-N	
P1-F	P3-F		P1-f	P4-P	
P1-J	P3-G		P1-v	P4-R	
P1-d	P3-H		P1-e	P4-S	
P1-CC	P3-J		P1-y	P4-T	
P1-b	P3-K		P1-w	P4-U	
P1-Z	P3-L		P1-V	P5-A	
P1-a	P3-M		P1-T	P5-B	
P1-s	P3-N		P1-U	P5-C	
P1-r	P3-P		P1-z	P5-D	
P1-DD	P3-R		P1-p	P5-E	
P1-t	P3-S		P1-AA	P5-G	
P1-u	P3-T		P1-m	P5-H	
P1-p	P4-A		P1-n	P5-I	
P1-j	P4-B		P1-k	P5-J	
P1-N	P4-C				

Main Power Cable W-6

From Pin	To Pin	Resistance	From Pin	To Pin	Resistance
P1-B	P2-B	Less than 2 ohms at each check.			
P1-C	P2-C				
P1-D	P2-D				

CDI ID-387 Cable W-7

From Pin	To Pin	Resistance	From Pin	To Pin	Resistance
P1-A	P2-B	Less than 2 ohms at each check, except where otherwise stated.	P1-L	P1-N	Less than 2 ohms at each check, except where otherwise stated.
P1-B	P2-A		P1-M	P2-L	
P1-E	P2-d		P1-P	P2-Z	
P1-F	P2-j		P1-R	P2-Y	
P1-J	P2-T		P1-S	P2-J	
P1-K	P2-S		P1-Z	P2-H	
P1-L	P2-G		P1-E	P2-W	100 ± 2K

6-6. Test Panel Troubleshooting

The troubleshooting procedures for the test panel are based on the results of the electrical tests performed in section V. The procedures listed in 6-6 c through 6-6 ae are in the same sequential order as the electrica! test procedures and provide step-by-step troubleshooting of each functional test not meeting performance standards. Where more than one test is necessary, the items are subdivided into substeps in order to isolate a malfunction to an assembly or circuit card. To facilitate the location of a malfunction, an interconnect wiring diagram (fig. FO-2), and parts location illustrations (figs. 6-1 through 63) are provided. Signal and voltage waveforms are included in the troubleshooting charts. If normal reading is obtained during first step of troubleshooting procedure and no fault is apparent, return to beginning of applicable electrical test procedure (para 6-12) and repeat electrical tests. If trouble cannot be located using troubleshooting procedures, refer test set to depot level maintenance. Removal and

replacement procedures are provided in section IV.

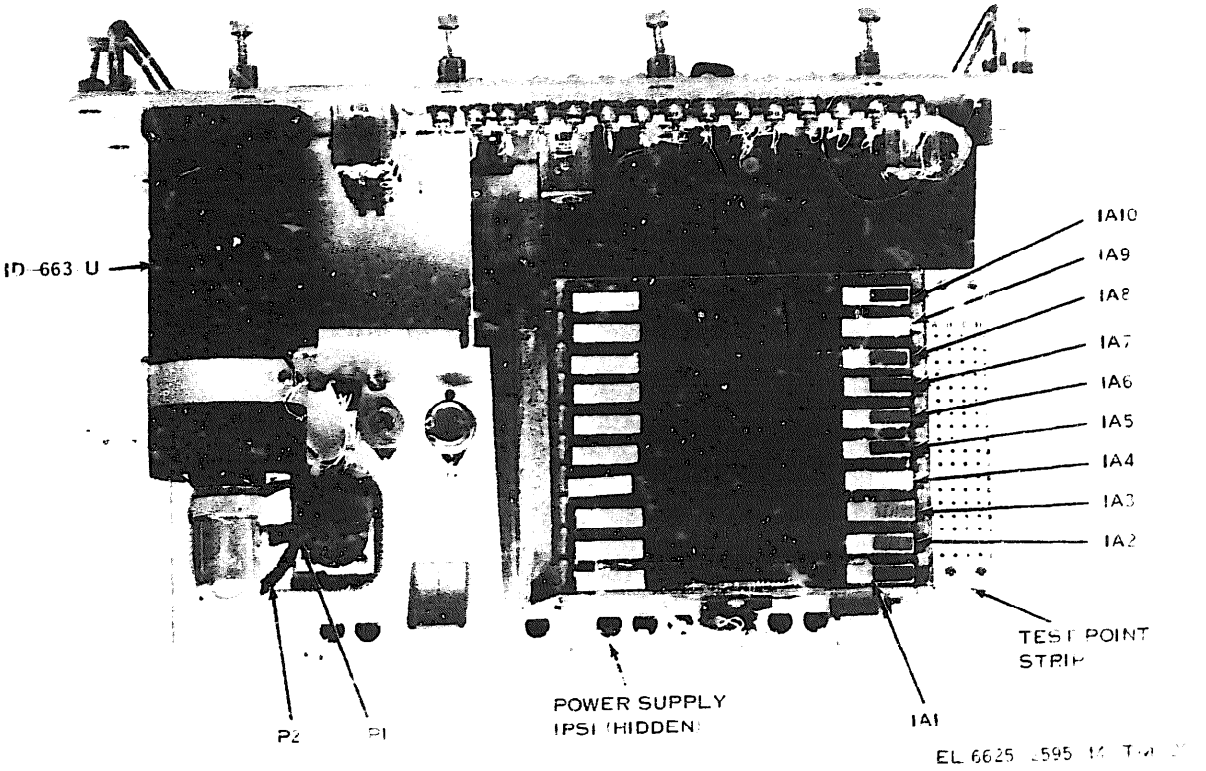

Figure 6-1. Test panel parts location (top view).

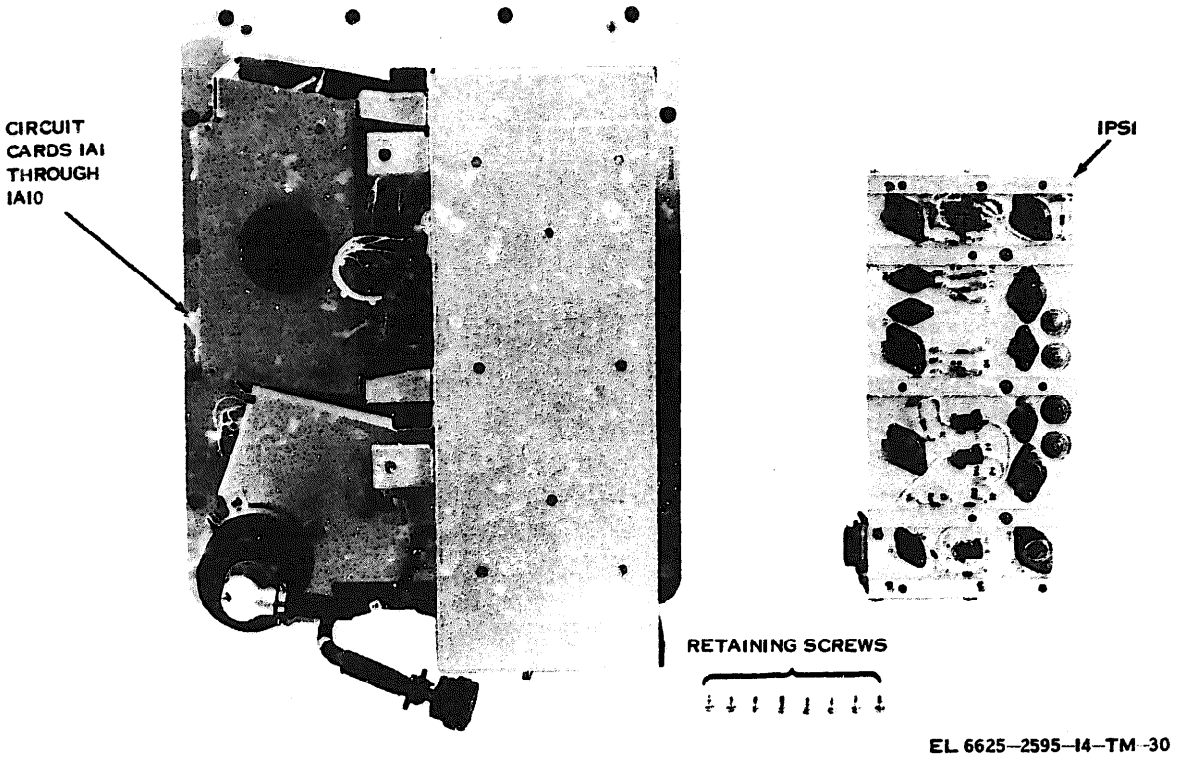

Figure 6-2. Test panel with power supply removed.

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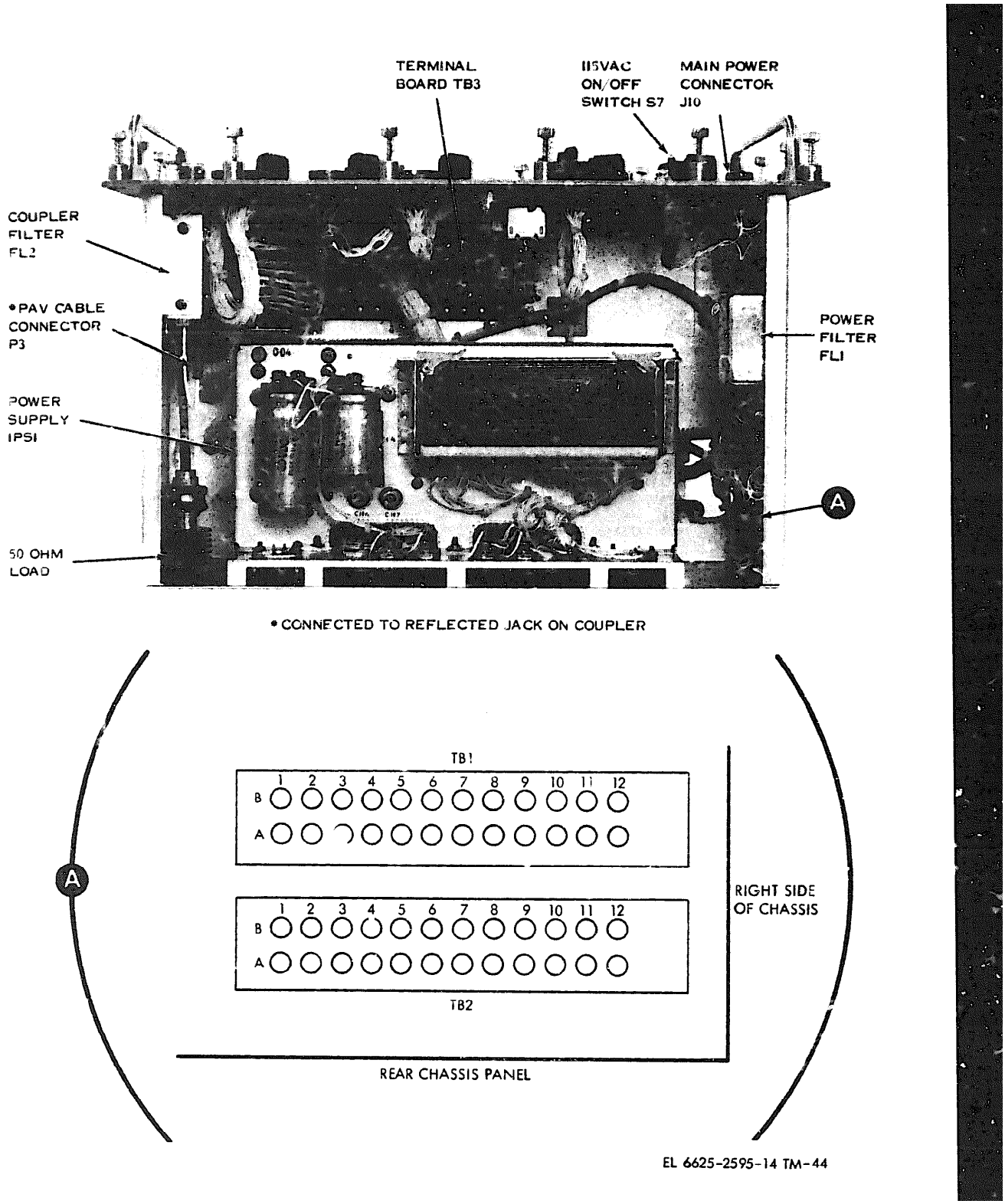


Figure 6-3. Test panel parts location (bottom view).

a. Bench Test Setup. The bench test setup of the test panel is shown in figure 6-4.

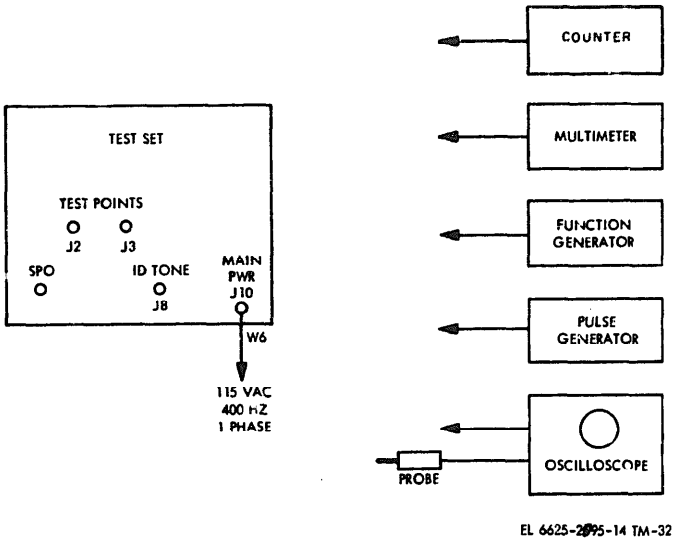


Figure 6-4. Test set bench test setup.

b. Initial Test Panel Control Settings. Prior to performing troubleshooting of the test panel set the controls on the test panel as follows:

(1) Front Panel :
115 VAC 400 HZ-ON
DISPLAY SELECT-DIGITAL INTERFACE
FUNCTION SELECT-CONTROL
PROGRAM SELECT-l
TEST POINT SELECTOR B-l C-l

(2) RADIO SET CONTROL
CAHN-1
MODE--X
Operation mode-AUTO

WARNING

Death or serious injury may result from electrical hazards when measuring the 115 VAC during troubleshooting, unless proper safety measures are observed. 115 VAC at 700 volt amps are present when the equipment is energized.

CAUTION

Whenever a circuit card is removed or a test cable disconnected, set the 115 VAC, 400 HZ switch to OFF. Damage to equipment can occur.

CAUTION

Remove input signals to TEST POINTS connectors after each test and before changing TEST POINT SELECTOR switches. Damage to equipment can occur.

c. Self Test Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	PWR ON lamp	*a. Front Panel* 115 VAC ON / OFF-ON DISPLAY SELECT-DIGITAL INTERFACE FUNCTION SELECT-RANGE PROGRAM SELECT-1 TEST POINT SELECTORS: A-1 B-1 C-1 *b. RADIO SET CONTROL* CHANNEL—1 X / Y MODE - X Operation Mode - AUTO		PWR ON lamp illuminated and TTM meter running.	*a.* If PWR ON lamp not illuminated and TTM is running, remove and replace lamp DS1. Repeat electrical checks, paragraph 6-12. *b.* If 115 Vac ON / OFF switch circuit breaker action does not hood, proceed to Item 1A. *c.* If PWR ON lamp not illuminated and TTM not running, check for 115 vac across MAIN POWER connector J10. (1) If voltage present, make a continuity check of 115 vac ON / OFF switch S7, power filter FL1, and TTM meter M2. Replace faulty component as required. Repeat electrical checks, paragraph 6-12. (2) If 115 vac not present, remove and replace J10. Repeat electrical checks, paragraph 6-12.
1A	Circuit Breaker	*1. Front Panel* 115 VAC ON / OFF-OFF *2. Test Panel* Disconnect power supply 1PS1 cable P1. *3. Front Panel* 115 VAC ON / OFF-ON	None	Circuit breaker set.	*a.* If circuit breaker trips, remove and replace 115 vac ON / OFF switch S-7. *b.* If circuit breaker does not trip, proceed to Item 1B.
1B	Circuit Card 1A7	*1. Front Panel* 115 VAC ON / OFF - OFF *2. Test Panel* Reconnect cable P1. Remove circuit card 1A7. *3. Front Panel* 115 VAC ON / OFF - ON	None	Circuit breaker Set.	*a.* If circuit breaker does not trip, replace faulty circuit card 1A7. Repeat electrical checks, paragraph 6-12. *b.* If circuit breaker does trip, proceed to Item 1C.
1C	Control Unit	*1. Front Panel* 115 VAC ON / OFF - OFF *2. Test Panel* Remove control unit. *3. Front Panel* 115 VAC ON / OFF - ON	None	Circuit breaker Set.	*a.* If circuit breaker does not trip, reinstall circuit card 1A7, replace faulty control unit. Repeat electrical checks, paragraph 6-12. *b.* If circuit breaker does trip, proceed to Item 1D.
1D	ID-663C / U	*1. Front Panel* 115 VAC ON / OFF - OFF	None	Circuit breaker set.	*a.* If circuit breaker does not trip, reinstall circuit card 1A7, control unit, and replace faulty ID-663 / C / U, repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1D (Cont'd)		*2. Test Panel* Disconnect cable from ID-663C/U. *3. Front Panel* 115 VAC ON/OFF - ON			*b.* If circuit breaker trips, remove and replace power supply 1PS1. Repeat electrical checks, paragraph 6-12. *c.* If trouble persists, refer test set to depot level.
2	TEST SET NO/GO - "GO"	Same as 1.	None	TEST SET NO/GO indicator not illuminated.	If indicator illuminated proceed to item 2A.
2A	Power Supply Status (TSPS)	Set OSCILLOSCOPE AN/USM-281A, to measure 2 to 5 Vdc.	Terminal Board TB2-A2	Less than 0.4 vdc.	*a.* If normal voltage present, proceed to step 2B. *b.* If normal voltage not present, proceed to step 2C.
2B	Circuit cards 1A1 and 1A10	*1. Front Panel* TEST POINT SELECTOR: C-5 (DRA) 2. Set oscilloscope to measure a 10 Hz 5V squarewave. 3. Monitor display at TEST POINTS connector J3.	TEST POINTS connector J3	10 Hz 5V squarewave, present and TEST SET NO/GO indicator not illuminated.	*a.* If display is present, remove and replace 1A10 and 1A1 circuit cards. Repeat electrical checks, paragraph 6-12. *b.* If display not present, remove and replace circuit card 1A7. If display still not present, check continuity of TEST POINTS connector J3. Replace J3 if necessary. Repeat electrical checks, paragraph 6-12. *c.* If trouble persists, refer test set to depot level.
2C	Power Supply 1PS1 and associated circuit cards.	1. Set Oscilloscope to measure 0 to 5 VDC. 2. Monitor voltage at terminal board TB2-A2 while lifting extractors on circuit cards 1A1 thru 1A10 in sequence until all cards are disconnected.	TB2-A2	Less than 0.4 vdc	*a.* If normal voltage is monitored, remove and replace last card disconnected. Reinstall all other cards and repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not monitored, reinstall all cards and proceed to step 2D.
2D	Power Supply 1PS1 and control unit	1. Set Oscilloscope to measure 0 to 5 VDC. 2. Monitor voltage at terminal board TB2-A2. *3. Front Panel* 115 VAC ON/OFF - OFF *4. Test Panel* Remove control unit. *5. Front Panel* 115 VAC ON/OFF - ON	TB2-A2	Less than 0.4 vdc	*a.* If normal voltage is monitored, replace faulty control unit. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not monitored, remove test set power, install control unit and proceed to step 2E.
2E	Power Supply 1PS1 and ID-663	1. Set Oscilloscope to measure 0 to 5 vdc. 2. Monitor voltage at terminal board TB2-A2.	TB2-A2	Less than 0.4 vdc	*a.* If normal voltage is monitored, replace faulty ID-663. Repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
2E (Cont'd)		*3. Test Panel* Disconnect ID-663 connector P2. *4. Front Panel* 115 VAC ON / OFF - ON			*b.* If a normal voltage is not monitored, remove and replace power supply 1PS1. Repeat electrical checks; paragraph 6-12. *c.* If trouble persists, refer test set to depot level.
3	TEST SET NO / GO NO / GO	*1. Front Panel* 115 VAC ON / OFF - OFF *2. Test Panel* Remove circuit card 1A7. *3. Front Panel* 115 VAC ON / OFF - ON	None	TEST SET NO / GO indicator illuminated (with 1A7 removed).	*a.* If TEST SET NO / GO indicator not illuminated, proceed to Item 3A.
3A	Circuit Card 1A1	*Front Panel* Depress TEST INITIATE switch.	None	TEST SET NO / GO indicator illuminated.	*a.* If indicator illuminated, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12. *b.* If indicator not illuminated, proceed to Item 3B.
3B	+28 Vdc supply	*Multimeter* DC-30V Scale	Terminal Board TB1A-6	+28 ± 3.0 vdc	*a.* If normal voltage present, proceed to Item 3C. *b.* If normal voltage not present, refer to Item 2C.
3C	+5 Vdc Supply	*Multimeter* DC-10V Scale	Terminal Board TB2A-3	+5 ± 0.5 vdc	*a.* If normal voltage present, remove and replace circuit card 1A10, reinstall circuit card 1A7. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage not present, refer to Item 2C.
4	Front Panel lamps and indicators.	*1. Front Panel* 115 VAC ON / OFF - OFF *2. Test Panel* Reinstall circuit card 1A7. *3. Front Panel* 115 VAC ON / OFF - ON Depress and hold TEST INITIATE switch.	None	All lamps and indicators illuminated except one half of: UPDATE / STOP and SELF TEST HOLD / SELF TEST RELEASE	If one or more lamps and indicators fail to illuminate check lamps, if trouble persists, proceed to Item 4A.
4A	TEST INITIATE Switch.	Same as 4.	None	Same as 4.	*a.* If spare lamps do not illuminate check spare lamp bulbs. If trouble persists, refer test set to depot level. *b.* If spare lamps illuminate, selectively remove and replace circuit cards 1A9 and 1A10. If trouble persists, refer test set to depot level.
5	Circuit Card 1A1	*Front Panel* Release TEST INITIATE switch.	None	Test initiate switch indicator goes out.	*a.* If TEST INITIATE indicator does not go out, replace circuit card 1A1.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5 (Cont'd)				After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	*b.* If INTL CONT NO GO lamp does not illuminate, proceed to Item 5A. *c.* If TEST INITIATE indicator does not illuminate, proceed to Item 5C. *d.* If any other NO GO lamps illuminate, proceed with electrical tests, paragraph 6-12c 6 Fault Isolation procedures are provided in later tests.
5A	Circuit Card 1A1 (DTI)	*1. Front Panel* TEST POINTS SELECTORS: A-11 B-12 2. Set oscilloscope to measure 6 vdc. *3. Front Panel* Press and release TEST INITIATE switch.	TEST POINTS connector J2	22 seconds after release of TEST INITIATE switch voltage drops from >2.4 to 0 vdc for a period of 10 seconds.	*a.* If normal voltage is present, proceed to Item 5B. *b.* If normal voltage is not present, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If voltage still not present, check continuity of TEST POINTS connector J2. Replace J2 if necessary. Repeat electrical checks, paragraph 6-12. *c.* If trouble persists, refer test set to depot level.
5B	Test Initiate Command (TIC) circuitry.	*1. Front Panel* TEST POINTS SELECTORS: A-8 B-8 2. Set oscilloscope to measure 0 vdc. *3. Front Panel* Press and release TEST INITIATE switch.	Test points connector J2.	0 vdc.	*a.* If normal voltage is present, remove and replace circuit card 1A10. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level. *b.* If normal voltage is not present, remove and replace circuit card 1A2. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level.
5C	Same as 5	*Front Panel* Press and release TEST INITIATE switch.	None	After 32 ± 1 seconds TEST INITIATE indicator illuminates.	If indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE TEST. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
6	SELF TEST HOLD / SELF TEST RELEASE switch.	*Front Panel* Depress SELF TEST HOLD / SELF TEST RELEASE switch several times.	None	Segments alternately illuminate	If either segment fails to illuminate, check lamps. If lamps good and trouble persists, refer test set to depot level.
7	UPDATE / STOP switch.	*Front Panel* Depress UPDATE / STOP switch several times.	None	Segments alternately illuminate.	Same as 6.

d. Power Supply Output Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	26 vac supply.	*1. Front Panel* 115 VAC ON / OFF - ON *2. Multimeter* ME-26 / U AC - 50 V Scale.	Terminal Board TB1A-1	26 ± 3 vac	If voltage not present, proceed to Item 1A.
1A	ID-663C / U	*1. Front Panel* 115 Vac ON / OFF - OFF *2. Test Panel* Disconnect ID-663 connector. *3. Front Panel* 115 Vac ON / OFF - ON *4. Multimeter* AC-50V Scale.	Same as 1	26 ± 3 vac	*a.* If voltage present, remove and replace faulty ID-663C / U. Repeat electrical checks, paragraph 6-12. *b.* If voltage not present, proceed to Item 1B.
1B	Control Unit	*1. Front Panel* 115 Vac ON / OFF - OFF *2. Test Panel* Remove control unit. *3. Front Panel* 115 Vac ON / OFF - ON *4. Multimeter* AC-50V Scale.	Same as 1	26 ± 2 vac	*a.* If voltage present, replace faulty control unit. Reconnect ID-663 connector. Repeat electrical checks, paragraph 6-12. *b.* If voltage not present, proceed to Item 1C.
1C	Circuit Card 1A7	*1. Front Panel* 115 Vac ON / OFF - OFF *2. Test Panel* Remove Circuit Card 1A7. *3. Front Panel* 115 Vac ON / OFF - ON *4. Multimeter* AC-50V Scale.	Same as 1	26 ± 2 vac	*a.* If voltage present, replace faulty circuit card 1A7, reconnect ID-663C / U connector and reinstall control unit, repeat electrical checks, paragraph 6-12. *b.* If voltage not present, remove and replace power supply 1PS1. Repeat electrical checks, paragraph 6-12. *c.* If trouble persists, refer test set to depot level
2	10 Vac supply	*Multimeter* AC-15V Scale.	Terminal Board TB1A-4.	10 ± 1.2 vac	If normal voltage not present proceed to Item 2A.
2A	ID-663C / U	*1. Front Panel* 115 Vac ON / OFF - OFF *2. Test Panel* Disconnect ID-663C / U connector. *3. Front Panel* 115 Vac ON / OFF - ON *4. Multimeter* AC-15V Scale.	Same as 2	Same as 2	*a.* If normal voltage present, replace faulty ID-663 C / U. *b.* If normal voltage not present, remove and replace power supply 1PS1. Repeat electrical checks, paragraph 6-12. *c.* If trouble persists, return test set to depot level.

e. Control Unit Circuitry Troubleshooting.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Display lamp indications	*1. Front Panel* 115 Vac ON / OFF - ON *2. Radio Set Control* CHAN - 125 X / Y MODE - X Operation Mode - AUTO	None	A / A, T / R, 80, 40, 4, and 1 control display lamps illuminated.	If one or more lamps not illuminated, proceed to Item 1A.
1A	Control Unit Word (CUW) Circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 5 2. Set OSCILLOSCOPE AN / USM-281A for a 2.5 to 5 msecs / CM HORIZONTAL Sweep and an amplitude of 30 volts / CM.	Test Points Connector J2.	See waveform F, fig. 6-8	*a.* If display present, proceed to Item 1C. *b.* If display not present, proceed to Item 1B.
1B	—5 Vdc supply	*Multimeter ME-26 / U* DC-10V Scale.	Terminal Board TB2B-7.	—5 ± 0.4 Vdc ..	*a.* If normal voltage present, remove and replace control unit. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not present, check continuity between contacts 7 and 8 or relay K1. Replace K1 if necessary. If K1 is not faulty, proceed to subparagraph 6-6*c*. 2H.
1C	Display control Word Display voltage.	Set Oscilloscope to measure less than 0.4 Vdc.	Test Point Strip TPB-10	Less than 0.4 Vdc ..	*a.* If normal voltage is present, proceed to Item 1D. *b.* If normal voltage is not present, refer test set to depot level.
1D	Transfer Serial Data Train (TSDT) Circuit.	*1.* Set Oscilloscope for a 2.5 to 5 msec / CM HORIZONTAL sweep and a 1 volt / CM amplitude. *2. Front Panel* TEST POINT SELECTORS: A-11 B-9	TEST POINTS Connector J2.	See waveform G, fig. 6-8	*a.* If display present, proceed to Item 1E. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
1E	Serial Data Train Clock (SDTC) Circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 10 2. Set oscilloscope for a 2.5 to 5 msec / CM HORIZONTAL sweep at a 1 volt / CM amplitude.	Same as 1E	See waveform H, fig. 6-8.	*a.* If display present, proceed to Item 1F. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
1F	*Display* Memory (DMRY complement) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 11	TEST POINTS jack J2.	See waveform K, fig. 6-8.	*a.* If Display present, remove and replace circuit card 1A8. Repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1F Cont'd)		2. Set Oscilloscope for a 50 sec / CM HORIZONTAL sweep at a 1 volt / CM amplitude.			*b.* If display not present, proceed to Item 1G.
1G	Sync Bit A (SYA) Circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B-11 C-7 2. Set Oscilloscope for 2.5 to 5 msec / CM HORIZONTAL sweep at a 1 volt / CM amplitude.	TEST POINTS jack J3.	See waveform G, fig. 6-8.	*a.* If display present, remove and replace circuit card 1A8. Repeat electrical checks, paragraph 6-12, *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
2	Display Lamp Indications	Radio Set Control CHAN - 87 X / Y MODE - Y Operation Mode Switch - REC	None	*a.* Y mode 80, 4, 2, and 1 control display lamps illuminated. *b.* A / A, T / R, REC lamps not illuminated.	*a.* Remove and replace control unit. *b.* Replace control unit. *c.* Refer control unit to depot level.
3	Display lamps indications	*Radio Set Control* CHAN - 47 Operation Mode Switch - T / R	None	T / R, Y, 40, 4, 2 and 1 control display lamps illuminated.	Replace control unit.
4	Display lamp indications	*Radio Set Control* CHAN - 38 X / Y MODE - X Operation Mode Switch - A / A	None	A / A. 20, 10, 8 Control Display lamps illuminated.	Replace control unit.
5	STATUS indicators	*Radio Set Control* Press and hold BIT pushbutton	None	*a.* NO / GO, GO STATUS and ECM WARN indicators illuminated. *b.* Control Display lamps S / T, A / A, 20, 10, 8 illuminated.	If one or more indicators not illuminated, remove and replace control unit. Refer control unit to depot level. Repeat electrical checks, paragraph 6-12.
6	Same as 5.	*Radio Set Control* Release BIT pushbutton.	None	All STATUS indicators not illuminated for two seconds.	If lamps remain illuminated, remove and replace the control unit and circuit card 1A1 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12.
7	NO / GO STATUS indicator circuit.	None.....	None	Two seconds after release of BIT pushbutton NO / GO STATUS indicator illuminated.	*a.* If indicator illuminates, proceed to Item 7B. *b.* If indicator not illuminated, proceed to Item 7A.
7A	System Monitor Status (SMS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 6	TEST POINTS connector J2.	+4 ± 1 Vdc two to four seconds after release of BIT pushbutton.	*a.* If normal voltage present, remove and replace control unit. Refer control unit to depot level. Repeat electrical checks paragraph 6-12.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
7A (Cont'd)		*2. Multimeter* DC-30V Scale *3. Radio Set Control* Depress and release BIT pushbutton.			*b.* If normal voltage is not present, remove and replace circuit cards 1A1 and 1A7 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12. *c.* If normal voltage still not present, remove power supply 1PS1 (paragraph 6-8*c*). Check continuity across contacts 1 and 2 of relay K1. Replace K1 if necessary. If trouble still persists, refer test set to depot level.
7B	GO Status indicator circuit	None	None	Four seconds after release of BIT pushbutton GO STATUS indicator illuminated.	*a.* If indicator illuminates, proceed to item 7D. *b.* If indicator does not illuminate, proceed to Item 7C.
7C	System Monitor Status (SMS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 6 *2. Multimeter* DC-30V Scale *3. Radio Set Control* Depress and Release BIT pushbutton.	TEST POINTS Connector J2	+11 ± 2 vdc four to six seconds after release of BIT pushbutton.	*a.* If normal voltage is present, remove and replace control unit. Refer control unit to depot level. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not present, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.
7D	ECM WARN indicator circuit	Same as 6.	None	6 seconds after release of BIT pushbutton ECM WARN indicator illuminated.	If indicator not illuminated proceed to Item 7E.
7E	System Monitor Status (SMS)	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 6 *2. Multimeter* DC-30V Scale. *3. Radio Set Control* Depress and release BIT pushbutton.	TEST POINTS Connector J2	−7 ± 2 vdc six to eight seconds after release of BIT	*a.* If normal voltage is present, remove and replace control unit. Refer control unit to depot level. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not present, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.
8	ECM WARN and Status indicators	Same as 6	None	ECM WARN and NO-GO and GO STATUS indicators not illuminated 8 seconds after release of BIT pushbutton.	If one or more indicator illuminated, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
9	Identity Tone circuit	*1. Front Panel* Headset inserted in ID TONE jack J8. *2. Radio Set Control* Volume—Centered.	ID Tone jack J8	1 KHz audio tone audible in headset.	*a.* If no tone audible in headset, remove and replace circuit cards 1A1 and 1A7 and control unit sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12. *b.* If tone still not audible perform the following: (1) Check continuity of ID TONE connector J8. Replace J8 if necessary. (2) Remove power supply 1PS1 (paragraph 6-8C). Check continuity of transformer T1 and across contacts 4 and 5 of relay K1. Replace T1 or K1 if necessary. (3) Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
10	Identity Tone control circuit	*Radio Set Control* Vary VOL control fully cw and ccw	ID TONE jack J8	1 KHz tone varies from loud to off.	*a.* If tone is audible but there is no variation, remove and replace control unit. Repeat electrical checks, paragraph 6-12. *b.* If tone varies but is low in volume, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.

f. Program Selection Circuitry Troubleshooting.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Input Line Data (IDC)	*1. Front Panel* DISPLAY SELECT-DIGITAL INTERFACE TEST POINT SELECTORS A - 11 B - 2 C - 2 PROGRAM SELECT-1 *2. Radio Set Control* Operation Mode - AUTO *3. Oscilloscope AN/USM-281A* VERTICAL DEFLECTION 1 volt/CM TIME BASE 5 μsecs/CM +INT SYNC *4. Front Panel* Depress and release ENTER switch.	Connect CHAN A input of Oscilloscope to TEST POINTS Connector J2.	See Figure 6-5 (PROG 1).	If display is not present, check continuity of J2 and PROGRAM SELECT switch S4. Replace if necessary. If J2 or S4 are not faulty, proceed to Item 1A.
1A	Input Data Command (IDC)	Same as 1	Connect Oscilloscope to TEST POINTS connector J3.	See figure 6-5 (IDC).	*a.* If display present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists refer test set to depot level. *b.* If display not present, proceed to item 1B.
1B	Switch ENTER (SENT) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 4 2. Set Oscilloscope to measure less than 0.4 vdc. *3. Front Panel* Depress and release ENTER switch.	TEST POINTS Connector J2.	Less than 0.4 vdc	*a.* If normal voltage is present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not present, refer tests to depot level.
2	Input Line Data (IDL) circuit	*1. Front Panel* DISPLAY SELECT DIGITAL INTERFACE TEST POINT SELECTORS: A - 11 B - 2 C - 2 PROGRAM SELECT-2 *2. Radio Set Control* Operation Mode - AUTO	Connect CHAN A input of Oscilloscope to TEST POINTS Connector J2.	See figure 6-5. (PROG. 2)	If display not present, remove and replace circuit card 1A7. If display still not present, check continuity of PROGRAM SELECT switch S4. Replace S4 if necessary. Repeat electrical checks. paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
2 (Cont'd)		*3. Oscilloscope AN/USM-281A* VERTICAL DEFLECTION-1 volt/CM TIME BASE - 5 μsecs/CM +INT SYNC *4. Front Panel* Depress and release ENTER switch.			
3	Input Line Data (IDL) circuit	*1. Front Panel* DISPLAY SELECT-DIGITAL INTERFACE TEST POINT SELECTORS: A - 11 B - 2 C - 2 PROGRAM SELECT-3 *2. Radio Set Control* Operation Mode - AUTO *3. Oscilloscope AN/USM-281A* VERTICAL DEFLECTION - 1 volt/CM TIME BASE - 5 μsecs/CM +INT SYNC *4. Front Panel* Depress and release ENTER switch.	Connect CHAN A input of Oscilloscope to TEST POINTS Connector J2.	See figure 6-5 (PROG 3).	If display not present, remove and replace circuit card 1A7. If display still not present check continuity of PROGRAM SELECT switch S4. Replace S4 if necessary. Repeat electrical checks, paragraph 6-12.
4	Input Line Data (IDL) circuit	*1. Front Panel* DISPLAY SELECT-DIGITAL INTERFACE TEST POINT SELECTORS: A - 11 B - 2 C - 2 PROGRAM SELECT-4 *2. Radio Set Control* Operation Mode - AUTO *3. Oscilloscope AN/USM-281A* VERTICAL DEFLECTION - 1 volt/CM TIME BASE - 5 μsecs/CM +INT SYNC *4. Front Panel* Depress and release ENTER switch.	Connect CHAN A input of Oscilloscope to TEST POINTS connector J2.	See figure 6-5 (PROG 4)	If display not present, remove and replace circuit card 1A7. If display still not present, check continuity of PROGRAM SELECT switch S4. Replace S4 if necessary. Repeat electrical checks, paragraph 6-12.
5	Input Line Data (IDL) circuit	*1. Front Panel* DISPLAY SELECT-DIGITAL INTERFACE TEST POINT SELECTORS: A - 11 B - 2 C - 2	Connect CHAN A input of oscilloscope to TEST POINTS Connector J2.	See figure 6-5 (PROG 5)	If display not present, remove and replace circuit card 1A7. If display still not present, check continuity of PROGRAM SELECT switch S4. Replace S4 if necessary. Repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5 Cont'd)		PROGRAM SELECT-5 *2. Radio Set Control* Operation Mode - AUTO *3. Oscilloscope AN / USM-281A* VERTICAL DEFLECTION 1 volt / CM TIME BASE - 5 μsecs / CM +INT SYNC *4. Front Panel* Depress and release ENTER switch.			

g. Multiplexer Display Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Range Bit Display (TAD)	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 7 FUNCTION SELECT RANGE	None	All control display lamps illuminated except Y Mode.	If one or more lamps not illuminated, check continuity of FUNCTION SELECT switch S3. Replace S3 if necessary. If trouble still persists, proceed to Item 1A.
1A	Translated Serial Data Train (TSDT) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 9 2. Set OSCILLOSCOPE AN / USM-281A to measure 6 Vdc.	TEST POINTS Connector J2	2.4 to 5.2 Vdc ..	*a.* If normal voltage is present, proceed to Item 1B. *b.* If normal voltage is not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
1B	Serial Data Train Command (SDTC)	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 10 2. Set Oscilloscope TIME BASE for 1 μsec / CM.	TEST POINTS Connector J2	See waveform I, fig. 6-8.	*a.* If display present, proceed to Item 1C. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
1C	Display Memory (DMRY) complement circuit.	*a. Front Panel* TEST POINT SELECTORS: A - 11 B - 11 *b.* Set oscilloscope for a 50 μsec / CM HORIZONTAL sweep at 1 volt / CM amplitude.	TEST POINTS Connector J2.	See waveform J, fig. 6-8.	*a.* If display present, remove and replace circuit cards 1A8 and 1A9 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
2	Range Bit Display (TAD)	*Front Panel* TEST POINT SELECTORS: A - 11 B - 7 FUNCTION SELECT-RANGE Apply chassis ground to TEST POINTS Connector J2.	None	All range display lamps not illuminated except 0.	If one or more display lamps remain illuminated, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
3	HOLD circuit	*Front Panel* UPDATE / STOP-STOP Remove ground from TEST POINTS connector J2.	None	All Range Display lamps not illuminated.	If one or more display lamps illuminated, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
4	UPDATE circuit	*Front Panel* UPDATE / STOP - UPDATE	None	All Range Display lamps illuminated except 0.	If one or more display lamps not illuminated, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.

Item No.	Item checked	Test procedures	Point of measurement	Normal readi	Corrective action
5	Data Request A (DRA) circuit	*1. Front Panel* TEST POINT SELECTOR: C-5 FUNCTION SELECT-CONTROL *2.* Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J3	Less than 0.4 vdc	*a.* If normal voltage is not present, remove and replace circuit card 1A7. If normal voltage is still not present, check continuity of FUNCTION SELECT switch S3. Replace S3 if necessary. Repeat electrical checks, paragraph 6-12. *b.* If trouble persists, refer test set to depot level.
6	Data Request B (DRB) circuit.	*1. Front Panel* TEST POINT SELECTOR: C - 6 2. Set Oscilloscope to measure a 10 Hz squarewave with an amplitude +6 vdc.	TEST POINTS Connector J3	10 ± 0.1 Hz squarewave 2.4 to 5.2 vdc amplitude.	If display not present, remove and replace circuit card 1A7. If display still is not present, check J3 for continuity or short. Replace J3 if necessary. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
7	Data Request B (DRB) circuit.	*1. Front Panel* FUNCTION SELECT-BEARING 2. Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J3	Less than 0.4 vdc.	*a.* If normal voltage is not present, remove and replace circuit card 1A7. If normal voltage still is not present, check continuity of FUNCTION SELECT switch S3. Replace S3 if necessary. Repeat electrical checks, paragraph 6-12. *b.* If trouble persists, refer test set to depot level.
8	Data Request A (DRA) circuit	*1. Front Panel* TEST POINT SELECTOR: C - 5 2. Set Oscilloscope to measure a 10 Hz squarewave with an amplitude of 6 vdc.	TEST POINTS Connector J3.	10 ± 0.1 Hz squarewave 2.4 to 5.2 vdc amplitude.	If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set depot level.
9	Data Request A (DRA) circuit.	*1. Front Panel* TEST POINT SELECTOR: C - 5 FUNCTION SELECT-RANGE 2. Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J3.	10 ± 0.1 Hz squarewave 2.4 to 5.2 vdc amplitude.	If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer set to depot level.
10	Data Request B (DRB) circuit.	*Front Panel* TEST POINT SELECTOR: C - 6	TEST POINTS Connector J3.	Same as 9	If normal voltage is not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
11	DATA VALID display (DVT)	*Front Panel* TEST POINT SELECTORS: A - 11 B - 3 Apply chassis ground to TEST POINTS Connector J2.	None	DATA VALID indicator not illuminated.	If indicator illuminated, remove and replace circuit card 1A7 and 1A9 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
12	Same as 11.	*Front Panel* Remove ground from TEST POINTS Connector J2.	None	DATA VALID indicator illuminated.	If indicator not illuminated, remove and replace circuit cards 1A7 and 1A9 sequentially following each removal and replacement repeat electrical checks, paragraph 6-12.

h. Range Display Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Range Bit Display	*Front Panel* TEST POINT SELECTORS: A - 1 B - 1 DISPLAY SELECT-RANGE	None	All RANGE Bits Display lamps illuminated except 0.	If one or more display lamps not illuminated. sequentially replace circuit cards 1A7 and 1A8. Repeat electrical checks, paragraph 6-12.
2	Same as 1.	*Front Panel* TEST POINT SELECTORS: A - 1 B - 1 Apply chassis ground to TEST POINTS Connector J2.	None	All RANGE Bit Display lamps illuminated except 204.8 miles and 0.	If any display lamps other than 204.8 and 0 are not illuminated. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.
3	Translated Range Bits TRBB thru TRBN circuits	*Front Panel* TEST POINT SELECTORS: A - 1 B - 2 through 12	None	One RANGE bit Display lamp not illuminated at each position.	If any Display lamps not illuminated, selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.
4	Translated Range Bit TRBM circuit	*1.* Remove ground from J2. *2. Front Panel* TEST POINTS SELECTORS: A - 2 B - 1 *3.* Apply chassis ground to TEST POINTS connector J2.	None	All RANGE bits Display lamps illuminated except 0 and 0.05 miles.	If any Display lamps other than 0 and 0.05 miles not illuminated. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.
5	Transfer Range Bit TBRN circuit.	*Front Panel* TEST POINTS SELECTORS: A - 2 B - 2 Ground removed from TEST POINTS connector J2.	None	All RANGE bits Display lamps illuminated except 0 and 0.025 miles.	If any Display lamps not illuminated except 0 and 0.025 miles. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks. paragraph 6-12.

i. Bearing Display Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Bearing Bit Display	*Front Panel* DISPLAY SELECT-BEARING TEST POINT SELECTORS: A - 2 B - 9	None	All BEARING Bit Display lamps illuminated except zeroes (0's).	If one or more display lamps not illuminated, selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*Front Panel* Apply Chassis ground to TEST POINTS Connector J2.	None	All BEARING Bit Display lamps illuminated except 256.0 degrees and zeroes (0's).	If any display lamps other than 256.0 degrees and zeroes (0's) are not illuminated. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.
3	Translated Bearing Bits B through D (TBBB—TBBD) circuits	*Front Panel* TEST POINT SELECTORS: A - 2 B - 10 through 12	None	One BEARING Bit Display lamp (128.0 to 32.0 degrees) not illuminated at each position.	If any display lamp other than required lamp for a position not illuminated, selectively replace circuit cards 1A6 and 1A8. Repeat electrical check, paragraph 6-12.
4	Translated Bearing Bit E (TBBE) circuit	*1.* Remove ground from J2. *2. Front Panel* TEST POINT SELECTORS: A - 3 B - 1 *3.* Apply chassis ground to TEST POINTS Connector J2.	None	All BEARING Bit display lamps illuminated except 16.0 degrees and 0.	If any display lamps other than the required lamp for a position not illuminated. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks paragraph 6-12.
5	Transfer Bearing Bits F through K (TBBF—TBBK)	*Front Panel* TEST POINT SELECTORS: A - 3 B - 2 through 7	None	One BEARING bit Display lamp 8.0 to 0.25 degrees not illuminated at each position.	If any display lamp other than the required lamp for a position not illuminated. Selectively replace circuit cards 1A6 and 1A8. Repeat electrical checks, paragraph 6-12.

j. Control Word Display Circuitry Troubleshooting.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Control Word Bit Display	*Front Panel* TEST POINT SELECTORS: A - 4 B - 1 DISPLAY SELECT-CONTROL WORD	None	All Control bit display lamps illuminated except ECCM, REC, T/R, and 100.	If one or more display lamps other than those indicated not illuminated, selectively replace circuit cards 1A3 and 1A8. Repeat electrical checks, paragraph 6-12.
2	Same as 1	Apply chassis ground to TEST POINTS Connector J2.	None	All Control Display lamps illuminated except ECCM, T/R, REC, 100, and 80.	If any display lamps other than those indicated not illuminated, selectively replace 1A3 and 1A8. Repeat electrical checks, paragraph 6-12.
3	Same a 1	*Front Panel* TEST POINT SELECTORS: A - 4 B - 2 through 12	None	The following CONTROL bit Display lamps not illuminated in the indicated selected positions. 2—ECCM, T/R, REC, 100, and 40 3—ECCM, T/R, REC, 100, and 20 4—ECCM, T/R, REC, 100, and 10 5—ECCM, T/R, REC, 100, and 8 6—ECCM, T/R, REC, 100, and 4 7—ECCM, T/R, REC, 100, and 2 8—ECCM, T/R, REC, 100, and 1 9—ECCM, REC, and 100 10—ECCM, REC, and 100 11—ECCM, T/R, REC, 100, and Y MODE 12—ECCM, T/R, REC, S/T, and 100	*a.* If any display lamps other than those indicated are not illuminated, selectively replace circuit cards 1A3 and 1A8. Repeat electrical checks, paragraph 6-12.

k. Digital Interface Word Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Serial Data Train (SDT) Display	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 6 FUNCTION SELECT CONTROL DISPLAY SELECT-SERIAL DATA *2.* Set FUNCTION GENERATOR SG-321/U for a +20V squarewave output and vary frequency from 1 to 10 Hz.	TEST POINTS Connector J2	All Control Display lamps blink except ECCM, REC, and 100.	If one or more display lamps other than ECCM, REC, and 100 not illuminated at a 1 Hz rate, proceed to Item 1A.
1A	Data Serial Word Mode (DSWM) circuit	*1. Front Panel* Same as 1. *2. Function Generator* Same as 1. *3.* Set oscilloscope AN/USM-281A measure less than 0.4 Vdc.	TEST POINTS Strip TPB-12	Less than 0.4 Vdc	*a.* If normal voltage is present, proceed to Item 1B. *b.* If normal voltage is not present, remove and replace, circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test set to depot level.
1B	*Display* Memory (DMRY) complement circuit.	*1.* Disconnect Function Generator from TEST POINTS connector J2. *2. Front Panel* TEST POINT SELECTORS: A - 11 B - 11 *3.* Set Oscilloscope to measure a 50 μsec/CM at 1 volt/CM pulse.	TEST POINTS Connector J2	See waveform K, fig. 6-8.	*a.* If display present, remove and replace circuit cards 1A7 and 1A8 sequentially following each removal and replacement, repeat electrical checks, paragraph 6-12. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12. If trouble persists, refer test to depot level.

l. Antenna Switch / Drive Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	ANT DRIVE (ASD) display	*Front Panel* TEST POINT SELECTORS: A - 5 B - 1	None	ANT DRIVE indicator not illuminated.	If indicator illuminated, remove and replace circuit card 1A9. Repeat electrical checks, paragraph 6-12.
2	Same as 1	Apply chassis ground to TEST POINTS Connector J2.	None	ANT DRIVE indicator illuminated.	If indicator not illuminated, remove and replace circuit card 1A9. Repeat electrical checks, paragraph 6-12.
3	ANT SWITCH (ASC) display	*1. Front Panel* Remove ground from TEST POINTS CONNECTOR J2. TEST POINTS SELECTORS: A - 12 B - 5 2. Set FUNCTION GENERATOR SG-321 / U for a 1 Hz (1 sec) + 10V squarewave.	TEST POINTS Connector J2	ANT SWITCH indicator illuminates at 1 Hz rate.	If indicator not illuminating at a 1 Hz rate, remove and replace circuit card 1A9. Repeat electrical checks, paragraph 6-12.

m. Bearing and Range Display Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	BEARING FLAG DRIVE (BFC) display	*Front Panel* TEST POINT SELECTORS: A - 12 B - 1	None	BEARING FLAG DRIVE indicator not illuminated.	If indicator illuminated, proceed to Item 1A.
1A	Translated Bearing Flag Command (TBFC) complement circuit.	*1. Front Panel* Same as 1. 2. Set OSCILLOSCOPE AN / USM-281A to measure 2 to 6 vdc.	TEST POINT Strip TPD-6	2.4 to 5.2 vdc	*a.* If normal voltage is present, remove and replace circuit card 1A10. Repeat electrical checks, paragraph 6-12. *b.* If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*Front Panel* Apply chassis ground to TEST POINTS Connector J2.	None	BEARING FLAG DRIVE indicator illuminated.	If indicator not illuminated, proceed to Item 2A.
2A	Same as 1A	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1A.	Less than 0.4 vdc.	Same as 1A.
3	RANGE FLAG DRIVE (RFC) display	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 2 *2. Test Panel* Disconnect P2 from ID-663C / U	None	RANGE FLAG DRIVE indicator not illuminated.	If indicator illuminated, proceed to Item 3A.
3A	Translated Range Flag Command (TRFC) complement circuit	*1. Front Panel* Same as 3. 2. Set Oscilloscope to measure 2 to 6 vdc.	Test Point Strip TDP-7	2.4 to 5.2 vdc	Same as 1A.
4	Same as 3	*Front Panel* Apply chassis ground to TEST POINTS Connector J2.	None	RANGE FLAG DRIVE indicator illuminated.	If indicator not illuminated, proceed to Item 4A.
4A	Same as 3A	*1.* Set Oscilloscope to measure less than 0.4 vdc. *2. Test Panel* Reconnect P2 to ID-663	Same as 3A	Less than 0.4 vdc.	Same as 1A.
5	RANGE VALID (RVC) display	*Front Panel* TEST POINT SELECTORS: A - 2 B - 3 Ground removed from TEST POINTS Connector J2.	None	RANGE VALID indictor not illuminated.	If indicator illuminated, remove and replace circuit cards 1A3 and 1A10 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12.
6	Same as 5	*Front Panel* Apply chassis ground to TEST POINTS Connector J2.	None	RANGE VALID indicator illuminated	If indicator not illuminated, remove and replace circuit cards 1A3 and 1A10 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
7	BEARING VALID (BVS) display	*Front Panel* Remove ground from TEST POINTS Connector J2. TEST POINTS SELECTORS: A - 3 B - 11	None	BEARING VALID indicator not illuminated.	Same as 5.
8	Same as 7	*Front Panel* Apply chassis ground to TEST POINTS Connector J2.	None	BEARING VALID INDICATOR illuminated.	Same as 6.

n. Identity Tone Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Identity Tone (IDD) Circuit	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 4 2. Set FUNCTION GENERATOR SG-321/U for a 1.1 KHz (909 μsecs) 15V squarewave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. 4. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1.	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
3	Identity Tone Status (IDDS) circuit	*1. Front Panel* Disconnect Function Generator from J2. TEST POINT SELECTORS: A - 11 B - 1 2. Set OSCILLOSCOPE AN/USM-281A to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc	If normal voltage is not present, proceed to Item 3A.
3A	Receiver Status (RST) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 8 B - 3 2. Set Oscilloscope to display an INT SYNC pulse with a TIME BASE of 0.5 sec/CM. *3. Front Panel* Connect Oscilloscope to TEST POINTS connector J2. Press and release TEST INITIATE switch.	None	Voltage switches from 4 to 0 vdc when TEST INITIATE switch is pressed and switches from 0 to 4 vdc when switch is released.	*a.* If display present, proceed to Item 3B. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
3B	One second gate (OSG) circuit	*a. Front Panel* TEST POINT SELECTORS: A - 8 B - 1 Connect Oscilloscope CHANNEL A to TEST POINTS Connector J2. Connect Oscilloscope EXT SYNC to TEST POINTS Connector J3.	TEST POINTS Connector J2.	See waveform L, fig. 6-8.	*a.* If display present, remove and replace circuit card 1A6. Repeat electrical checks, paragraph 6-12. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
3B (Cont'd)		*b.* Set Oscilloscope to sync with RST (ITEM 3A). *c. Front Panel* Depress and release TEST INITIATE switch.			
4	Identity Tone (IDD) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 4 2. Set Function Generator for a 1.3 KHz (733 μsec.) 15V squarewave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None Applicable.
5	Identity Tone (IDD) circuit	Same as 4	None	22 seconds after release of TEST INITIATE switch voltage drops from 5.2 to 0 vdc for a period of 10 seconds.	Refer to subparagraph 6-6c 5.
6	Identity Tone Status (IDDS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 1 2. Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2.	5.4 to 5.2 vdc	If normal voltage is not present, refer to Item 3A.
7	Identity Tone circuit (IDD)	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 4 2. Set Function Generator for a 1.7 KHz (588 μsecs) 15V squarewave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	Same as 1	Same as 1.
8	Same as 7	Same as 7	None	After 22 seconds, INTL CONT NG GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates	Refer to subparagraph 6-6c 5.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
9	Identity Tone Status (IDDS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 11 B - 1 2. Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc . .	If normal voltage is not present, remove and replace circuit card 1A6. Repeat electrical checks, paragraph 6-12.

o. Slow Gain Hunting Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Slow Gain Hunting Status (SGHS) circuit	*Front Panel* TEST POINT SELECTORS: A - 9 B - 7 Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds, INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
3	Same as 1	Set OSCILLOSCOPE AN/USM-281A to measure 2 to 6 vdc.	TEST POINTS Connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, proceed to Item 3A.
3A	One second Reset (OSR) complement circuit	*1. Front Panel* TEST POINT SELECTORS: A - 8 B - 4 Connector Oscilloscope CHANNEL A to TEST POINTS Connector J2. Connect Oscilloscope EXT SYNC to TEST POINTS Connector J3. *2.* Set Oscilloscope to display a 1 sec. pulse with / TIME BASE 0.5 sec / CM. *3. Front Panel* Depress and release TEST INITIATE switch.	TEST POINTS Connector J2. TEST POINTS Connector J2.	See waveform N, fig. 6-8.	*a.* If display present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12. *b.* If display not present, remove and replace circuit card 1A7. Repeat electrical checks, paragraph 6-12.
4	Same as 1	*1. Front Panel* TEST POINTS SELECTORS: A - 5 B - 12 *2.* Set FUNCTION GENERATOR SG-321/U A for a 0.3 Hz (3.33 secs) 0 to —8V sawtooth output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5	Same as 1	Same as 4.	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
6	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 9 B - 7 2. Set Oscilloscope to measure less than 0.4 vdc. *3. Front Panel* Connect Oscilloscope to TEST POINTS Connector J2.	TEST POINTS Connector J2.	Less than 0.4 Vdc ..	If normal voltage is not present, refer to Item 3A.
7	Slow Gain A Status (SGAS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 12 2. Set Function Generator for a 3.0 Hz (333 msecs) to 8.0V sawtooth output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. 4. Set Oscilloscope to measure from 0 to 6 Vdc.	Test point strip TPD-13	Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when the input to J2 reaches a threshold of —2 ± 0.5 volts. See waveform below.	*a.* If normal voltage is present, proceed to Item 7A. *b.* If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.
7A	Slow Gain B Status (SGBS) circuit.	Same as 7	Test Point Strip TPD-14	Switches from 5.2 vdc to less than 0.4 vdc when the input of J2 reaches a threshold of —4. ± 0.5 volts. See waveform B, fig. 6-8.	*a.* If normal voltage is present, proceed to Item 7B. *b.* If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks. paragraph 6-12.
7B	Slow Gain C Status (SGCS) Circuit.	Same as 7	Test Point Strip TPD-15	Switches from 5.2 vdc to less than 0.4 vdc when the input to J2 reaches a threshold —7 ± 0.5 volts. See waveform C, fig. 6-8.	If normal voltage is not present, remove and · place circuit card 1A3. Repeat electrical checks, paragraph 6-12.

p. YIG Tuning Current Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Preselector Tuning Test Status (PTT_1) circuit.	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 4 2. Set FUNCTION GENERATOR SG-321/U for a 3.0 Hz (333 msecs) 0 to + 3V sawtooth output. 3. Set OSCILLOSCOPE AN/USM-281A to measure 0 to 6 Vdc. *4. Front Panel* Connect Function Generator to TEST POINTS Connector J2.	Test Point Strip TPD-16	Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when input at J2 reaches threshold of 1.2 ± 0.5 volts and back to less than 0.4 vdc when the threshold reaches 1.8 ± 0.5 volts. See waveform D, fig. 6-8.	If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.

q. Fast Gain Control Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Fast Gain Test Status (FGTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 1 2. Set FUNCTION GENERATOR SG-321/U for a 3.0 Hz (333 msecs) 0 to —2V sawtooth wave output. 3. Set OSCILLOSCOPE AN/USM-281A to measure 0 to 6 vdc. *4. Front Panel* Connect Function Generator to TEST POINTS Connector J2.	Test Point Strip TPD-17	Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when input to J2 reaches threshold of —0.7 ± 0.3 volts and back to less than 0.4 vdc when input to J2 reaches threshold of —1.7 ± 0.3 volts. See waveform E, fig. 6-8.	If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.

r. Fine Bearing Modulation Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Fine Bearing Test Status (FBTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 11 2. Set FUNCTION GENERATOR SG-321/U for a 120 Hz (8.33 msecs) 3 VPP sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
3	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 6 2. Set OSCILLOSCOPE AN/USM-281A to measure less than 0.4 Vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12r.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 11 2. Set Function Generator for a 135 Hz (7.33 msecs) 3 VPP Sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
5	Same as 3	Same as 4	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
6	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 6 2. Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with electrical checks 6-12.
7	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 11 2. Set Function Generator for ± 140 Hz (7.14 msecs) 3 VPP Sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated	None applicable.
8	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
9	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 6 2. Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12r.

s. Course Bearing Modulation Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Course Bearing Test Status (CBTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 9 2. Set FUNCTION GENERATOR SG-321/U for a 11 Hz (90.9 msecs) 3 VPP Sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None Applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
3	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 4 2. Set OSCILLOSCOPE AN/USM-281A to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 9 2. Set Function Generator for a 15 Hz (66.6 msecs) 3 VPP sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
5	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
6	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 4 *2.* Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
7	Course Bearing Test Status (CBTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 9 *2.* Set Function Generator for a 18 Hz (55.5 msecs) 3 VPP Sine wave output. *3. Front Panel* Connect Function Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
8	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
9	Same as 1	*1. Front Panel* TEST POINTS SELECTORS: A - 10 B - 4 *2.* Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.

t. Main Reference Bursts Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Main Reference Bursts Test Status (MRTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 8 2. Set Data Pulse Type 110B for a 11 Hz (90.9 msec period) 5 msec positive ECL pulse output. (—1.5 to —0.75 vdc) *3. Front Panel* Connect pulse generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
3	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 8 2. Set OSCILLOSCOPE AN / USM-281A to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 8 2. Set pulse generator for 15 Hz (66.6 msec period) 5 msec positive ECL output pulse. (—1.5 to —0.75 vdc). *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO-GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c5.
6	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 8 *2.* Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
7	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 8 *2.* Set pulse generator for a 20 Hz (50 msec period) 5 msecs, positive ECL output pulse. (—1.5 to —0.75 vdc) *3. Front Panel* Connect pulse generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
8	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c. 5.
9	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 8 *2.* Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks paragraph 6-12*r*.

u. Auxiliary Reference Bursts Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Auxiliary Reference Bursts Test (ART) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 10 2. Set DATA PULSE TYPE 110B Pulse Generator for a 120 Hz (8.33 msec period) 0.5 msec, positive ECL output pulse (—1.5 to —0.75 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
3	Auxiliary Reference Bursts Test Status (ARTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 5 2. Set OSCILLOSCOPE AN / USM-281A to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 10 2. Set Pulse Generator for a 135 Hz (7.40 msec period) 0.5 msec, positive ECL output pulse (—1.5 to 0.75 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE SWITCH indicator not illuminated	None applicable.
5	Same as 1	Same as 4	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
6	Same as 3	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 5 2. Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks starting with paragraph 6-12*r*.
7	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 10 2. Set Pulse Generator for a 145 Hz (6.89 msec period) 0.5 msec, positive ECL output pulse (—1.5 to —0.75 vdc) *3. Front Panel* Connect pulse generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated	None applicable.
8	Same as 1	Same as 4	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
9	Same as 3	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 5 2. Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks starting with paragraph 6-12*r*.

v. First Pulse Valid Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	First Pulse Valid (FPV) A/A circuit	*1. Radio Set Control* Operation Mode-A/A *2. Front Panel* TEST POINT SELECTORS: A-6 B-2 *3.* Set DATA PULSE TYPE 110B Pulse Generator for a 19 Hz (52.6 msec period) 1 μsec, negative ECL output pulse. (—0.75 to —1.6 vdc) *4. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.		TEST INITIATE Switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
3	First Pulse Valid Status (FPVS) A/A circuit	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 9 *2.* Set OSCILLOSCOPE AN/USM-281A to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 2 *2.* Set Pulse Generator for a 22 Hz (45.5 msec period) 1 μsec negative ECL output pulse. (—0.75 to —1.6 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	TEST INITIATE switch indicator not illuminated	None applicable.
5	Same as 1	Same as 4	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the	*a.* If INT CONT NO GO lamp not illuminated, proceed to step 3. *b.* If TEST INITIATE indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5 (Cont'd)				TEST INITIATE indicator illuminates.	INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble not cleared, refer test set to depot level.
6	Same as 3	*1. Front Panel* TEST POINTS SELECTORS: A - 10 B - 9 2. Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks starting with paragraph 6-12*r*.
7	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 2 2. Set Pulse Generator for a 2.3 kHz (435 μsec period) 1 μsec, negative ECL output pulse. (—0.75 to —1.6 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
8	Same as 1	Same as 4	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
9	First Pulse Valid Status (FPVS) A/G	*1. Front Panel.* TEST POINT SELECTORS: A - 10 B - 10	TEST POINTS Connector J2.	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks starting with paragraph 6-12*r*.
10	Same as 9	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 2 2. Set Pulse Generator for a 2.5 kHz (400 μsec period) 1 μsec, negative ECL output pulse. (—0.75 to —1.6 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	TEST INITIATE switch indicator not illuminated	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
11	Same as 9	Same as 10	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
12	Same as 9	*1. Front Panel* TEST POINT SELECTORS A - 10 B - 10 *2.* Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS connector J2.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.
13	Same as 9	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 2 *2.* Set Pulse Generator for a 3.3 kHz (303 μsec period) 1 μsec, negative ECL output pulse. (—0.75 to —1.6 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated	None applicable.
14	Same as 9	Same as 13	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates	Refer to subparagraph 6-6*c* 5.
15	Same as 9	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 10 *2.* Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2.	Less than 0.4 vdc.	If normal voltage is not present, remove and replace circuit card 1A5. Repeat electrical checks, starting with paragraph 6-12*r*.

w. Composite Video Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Composite Video Test (CVT) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 7 2. Set DATA PULSE TYPE 110B Pulse Generator for a 450 Hz (2.22 msec) negative going pulse, —8V Peak (Reference = 0V), 2.5 μsec Negative pulse output. *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates	Refer to subparagraph 6-6c 5.
3	Receiver Video Rate Status (RVRS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 9 B - 5 2. Set OSCILLOSCOPE AN / USM-281A to measure less than 0.4 vdc.		Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 5 B - 7 2. Set Pulse Generator for a 500 Hz (2 msec) —8V peak (Reference = 0V), 2.5 μsec Negative pulse output.	None	TEST INITIATE switch indicator not illuminated	None applicable.
5	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6c 5.
6	Same as 3	*1. Front Panel* TEST POINT SELECTORS: A - 9 B - 5 2. Set Oscilloscope to measure 2 to 6 vdc.		2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.

x. Frequency Synthesizer Status Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Frequency Synthesizer Status Test (FST) complement circuit.	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 6 2. Set DATA PULSE TYPE 110B Pulse Generator for a 800 Hz (1.25 msec period) 20 μsec pulse width Positive ECL pulse output (—1.5 to —0.75 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds INTL CONT NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
3	Frequency Synthesizer Test Status (FGTS) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 2 2. Set OSCILLOSCOPE AN / USM-281A to measure 2 to 6 vdc.	TEST POINTS Connector J2	2.4 to 5.2 vdc	If normal voltage is not present, proceed to Item 3A.
3A	The Millisecond Gate (TMG) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 3 2. Set Oscilloscope for a 0.01 sec pulse with a TIME BASE 2 msecs / CM. Set trigger to + INT. *3. Front Panel* Connect CHAN A of Oscilloscope to TEST POINTS Connector J2. Depress and release TEST INITIATE switch.	TEST POINTS Connector J2	19 seconds after release of TEST INITIATE switch, observe display on oscilloscope. See waveform M, fig. 6-8.	*a.* If display is present remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*x*. *b.* If display not present, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.
4	Same as 1	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 6	None	TEST INITIATE switch indicator not illuminated.	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
4 (Cont'd)		2. Set Pulse Generator for a 1.1 kHz (909 μsec period) 20 μsec pulse width, positive ECL pulse output. (—1.5 to —0.75 vdc) *3. Front Panel* Connect Pulse Generator to TEST POINTS Connector J2.			
5	Circuit Card 1A1 and 1A2	*Front Panel* Release TEST INITIATE switch	None	After 22 seconds FREQ SYN NO GO INDICATIONS lamp illuminated. *b.* After 32 ± 1 seconds TEST INITIATE indicatior illuminated.	FREQ SYNTH NO GO lamp not illuminated, proceed to step 6. *b.* If indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble not cleared, refer test set to depot level.
6	Same as 3	*1. Front Panel* TEST POINT SELECTORS: A - 10 B - 2 2. Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0.4 vdc	*a.* If normal voltage is not present, proceed to Item 6A. *b.* If normal voltage is present, selectively replace circuit cards 1A2 and 1A10. Repeat electrical checks, paragraph 6-12.
6A	Ten millisecond Gate (TMG) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 12 B - 3 2. Set Oscilloscope for a 10 msec pulse with a TIME BASE 2 msecs/CM. Set trigger to + INT. *3. Front Panel* Connect CHAN A of Oscilloscope to TEST POINTS Connector J2. Press and release TEST INITIATE switch.	TEST POINTS Connector J2	19 seconds after release of TEST INITIATE switch, observe display on Oscilloscope. See wave form M, fig. 6-8.	*a.* If display is present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*x*. *b.* If display not present, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.

y. First and Second Pulse Command Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	First Pulse Command Range (FPCR) circuit	*1. Front Panel* 115 VAC OFF / ON-OFF. *2. Test Panel* Remove circuit card 1A3. Apply chassis ground to Test Point Strip TPD-4 and TPD-2. *3. Front Panel* TEST POINT SELECTORS: A - 2 C - 5 C - 12 4. Set DATA PULSE TYPE 110B Pulse Generator for a 1 μsec positive ECL (—1.5 to —0.75 vdc) double pulse at 20 Hz (50 msecs) with a 20 μsecs spacing. *5. Front Panel* Connect Pulse Generator to TEST POINTS Connectors J2 to J3. 115 VAC OFF / ON-ON Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
2	Circuit Card 1A1 and 1A2	*Front Panel* Release TEST INITIATE switch	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated	*a.* If RNG CMPTR NO GO lamp not illuminated, proceed to step 3. *b.* If TEST INITIATE indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble not cleared, refer test set to depot level.
3	First and Second Pulse Status (FSPS) circuit	Set OSCILLOSCOPE AN / USM-281A to measure less than 0.4 vdc.	Test Point Strip TPD-18	Less than 0.4 vdc ..	*a.* If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*x*. *b.* If normal voltage is present, selectively replace circuit cards 1A2 and 1A10. Repeat electrical checks, starting at paragraph 6-12*x*.
4	First Pulse Command Range (FPCR) circuit	*1.* Set the Pulse generator a 23 Hz (43.4 msec) output. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
5	Same as 4	Same as 4	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	Same as 2.
6	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure less than 0.4 vdc.	Test Point Strip TPD-18	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks paragraph 6-12*x*.
7	First Pulse Command Reset (FPCR) circuit	*1.* Set the Pulse Generator input pulse spacing to 12 μsecs. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
8	Circuit Card 1A1 and 1A2	*Front Panel* Release TEST INITIATE switch	None	After 22 seconds RNG CMPTR and PWR AMP NO GO INDICATIONS lamps illuminate and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	*a.* If RNG CMPTR or PWR AMP NO GO lamps not illuminated, remove and replace circuit card 1A2. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level. *b.* If TEST INITIATE indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble not cleared, refer test set to depot level.
9	First and Second Pulse Status (FSPS) circuit.	Set Oscilloscope to measure 2 to 6 vdc.	Test point strip TPD-18.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*x*.
10	First Pulse Command Range (FPCR) circuit	*1. Test Panel* Remove ground from Test Point Strip TPD-4. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
11	Same as 10	Same as 10	None	Same as 2	Same as 2.
12	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure less than 0.4 vdc	Test Point Strip TPD-18	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*k*.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
13	First Pulse Command Range (FPCR) circuit	*1.* Set the Pulse generator for 24 μsec pulse spacing output. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
14	Same as 13	Same as 13	None	Same as 8	Same as 8.
15	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure 2 to 6 vdc	Test Point Strip TPC-18.	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, paragraph 6-12*x*.
16	First Pulse Command Range (FPCR) circuit	*1. Test Panel* Remove the ground from Test Point Strip TPD-2 and apply chassis' ground to Test Point Strip TPD-3. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
17	Same as 16	Same as 16	None	Same as 2	Same as 2.
18	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure less than 0.4 vdc.	Test Point Strip TPD-18	Less than 0.4 vdc	If normal voltage is not presen remove and replace circuit card 1A4. Repeat electrical checks, paragraph 6-12*x*.
19	First Pulse Command Range (FPCR) circuit	*1.* Set the Pulse Generator input pulse spacing to 36 μsecs. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated	None applicable.
20	Same as 19	Same as 19	None	After 22 seconds RNG CMPTR and PWR AMP NO GO INDICATIONS lamps illuminate and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	*a.* If RNG CMPTR or PWR AMP NO GO lamps not illuminated, remove and replace circuit card 1A2. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level. *b.* If TEST INITIATE indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble not cleared, refer test set to depot level.
21	First and Second Pulse Status (FSPS) circuit	*1.* Set Oscilloscope to measure 2 to 6 vdc *2. Test Panel* Apply chassis ground to Test Point Strip TPC-18	Test Point Strip TPD-18	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, paragraph 6-12*x*.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
22	First Pulse Command Reset (RPCR) circuit	*Front Panel* Depress and release TEST INITIATE switch	None	TEST INITIATE switch indicator not illuminated.	None applicable.
23	Same as 22	Same as 22	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	*a.* If RNG CMPTR NO GO lamp not illuminated, proceed to step 3. *b.* If TEST INITIATE indicator not illuminated, remove and replace circuit card 1A1. Repeat TEST INITIATE test. If trouble is cleared, repeat electrical checks, paragraph 6-12. If trouble is not cleared, refer test set to depot level.
24	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure less than 0.4 vdc.	Test Point Strip TPD-18	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, paragraph 6-12*x*.
25	First Pulse Command Range (FPCR) circuit	*1.* Set the Pulse Generator for a 150 HZ (6.66 msec) output. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
26	Same as 25	Same as 25	None	Same as 8	Same as 20.
27	First and Second Pulse Status (FSPS) circuit	Set Oscilloscope to measure 2 to 6 vdc	Test Point Strip TPD-18	2.5 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, paragraph 6-12*x*.

z. Power Amplifier and Suppression Pulse Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Power Amplifier Video Status (PAVS) circuit	*1. Front Panel* 115 VAC OFF / ON-OFF *2. Test Panel* Remove circuit card 1A3. Remove connector P3 from Monitor Coupler (figure 6-3) Apply chassis ground to Test Point Strip TPD-2 and TPD-4. *3.* Using OSCILLOSCOPE AN / USM-281A set FUNCTION GENERATOR SG-321 / U for a 13 ± 2V squarewave in sync with the output of DATA PULSE TYPE 110B Pulse Generator. *4.* Using the Oscilloscope set the Pulse Generator for a 27 Hz (37 msec period) 4.7 vdc, 3 μsec pulse pair spaced 12 μsecs. *5. Test Panel* Connect Pulse Generator via adapter (BNC to CONHEX) to P3 (figure 6-3) *6. Front Panel* Connect Function Generator to SPO Connector J4 TEST POINT SELECTORS: A - 10 B - 3 115 VAC OFF / ON-ON Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
2	Same as 1	Same as 1	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	Refer to subparagraph 6-6y 2.
3	Same as 1	Set OSCILLOSCOPE AN / USM-281A to measure 2 to 6 vdc.	TEST POINTS Connector J2	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. If normal voltage still is not present, verify continuity of J4. Remove and replace J4 if necessary. Repeat electrical checks starting at paragraph 6-12*w*.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
4	Same as 1	*1. Test Panel* Remove ground from Test Point Strip TPD-4. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
5	Same as 1	Same as 4	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	Refer to subparagraph 6-6y 2 if either lamp is not illuminated.
6	Same as 1	Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, starting with paragraph 6-12*w*.
7	Same as 1	*1.* Set Pulse Generator pulse spacing for 24 μsecs. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE Switch indicator not illuminated.	None applicable.
8	Same as 1	Same as 7	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	Refer to subparagraph 6-6y 2.
9	Same as 1	Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS Connector J2	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*w*.
10	Same as 1	*1. Test Panel* Remove ground from Test Point Strip TPD-2. Apply chassis ground to Test Point Strip TPD-3. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
11	Same as 1	Same as 10	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6y 2.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
12	Same as 1	Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12*w*.
13	Same as 1	*1.* Set Pulse Generator pulse spacing for 36 μ secs. *2. Front Panel* Depress and release TEST INITIATE switch	None	TEST INITIATE switch indicator not illuminated.	None applicable.
14	Same as 1	Same as 13	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
15	Same as 1	Set Oscilloscope to measure 2 to 6 vdc.	TEST POINTS connector J2	2.4 to 5.2 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, starting at paragraph 6-12*w*.
16	Same as 1	*1.* Using the oscilloscope set Pulse Generator for a pulse amplitude of 4.2 volts. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.
17	Same as 1	Same as 16	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminates and after 32 ± 1 seconds the TEST INITIATE indicator illuminates.	Refer to subparagraph 6-6*c* 5.
18	Same as 1	Set Oscillosope to measure less than 0.4 vdc.	TEST POINTS connector J2	Less than 0.4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks, starting at paragraph 6-12*w*.
19	Same as 1	*1.* Set Pulse Generator frequency to 18 Hz (55.5 msecs) and a pulse amplitude of 4.7 volts. *2. Front Panel* Depress and release TEST INITIATE switch.	None	TEST INITIATE switch indicator not illuminated.	None applicable.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
20	Same as 1	Same as 19	None	After 22 seconds RNG CMPTR NO GO INDICATIONS lamp illuminated and after 32 ± 1 seconds TEST INITIATE indicator illuminated.	Refer to subparagraph 6-6c 5.
21	Same as 1	Set Oscilloscope to measure less than 0.4 vdc.	TEST POINTS Connector J2	Less than 0 4 vdc	If normal voltage is not present, remove and replace circuit card 1A4. Repeat electrical checks starting at paragraph 6-12w.

aa. Fault Precedence Logic Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Power Supply Status (PSS) complement circuit	*Front Panel* TEST POINTS SELECTORS: A - 7 B - 3 Apply chassis ground to TEST POINTS Connector J2. 115 VAC ON / OFF-ON Depress and release TEST INITIATE switch	None	From 22 to 32 seconds after release of TEST INITIATE switch PWR SPLY NO GO INDICATIONS lamp illuminated.	If lamp not illuminated proceed to Item 1A.
1A	Test Power Supply Status (TPSS) circuit	Set OSCILLOSCOPE AN / USM-281A to measure less than 0.4 vdc.	Test Point Strip TPC-13	Less than 0.4 vdc.	*a.* If normal voltage is present proceed to Item 1B. *b.* If normal voltage is not present, remove and replace circuit card 1A3. Repeat electrical checks, paragraph 6-12.
1B	Memory (MRY) complement circuit	*1. Front Panel* TEST POINT SELECTORS: A - 7 B - 3 C - 10 2. Set Oscilloscope to display a 18 μsecs negative pulse with a TIME BASE of 0.5 msec / CM and trigger to —INT. *3. Front Panel* Connect CHAN A of Oscilloscope to TEST POINTS Connector J3. Depress and release TEST INITIATE switch.	None	21 seconds after release of TEST INITIATE switch observe display on Oscilloscope See wave form O, fig. 6-8.	*a.* If display is present, remove and replace circuit card 1A2 and 1A10 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12. *b.* If display is not present, remove and replace circuit card 1A1. Repeat electrical checks, paragraph 6-12.
2	Same as 1	Same as 1	None	32 ± 1 seconds after release of TEST INITIATE switch. PWR SUPPLY NO GO INDICATIONS lamp not illuminated.	If lamp remains illuminated, refer to Item 1B.
3	Same as 1	*Front Panel* 1. Remove ground from TEST POINTS Connector J2. *2. Front Panel* TEST POINTS SELECTOR: A - 6 B - 6 3. Apply ground to TEST POINTS Connector J2. 4. Depress and release TEST INITIATE switch.	None	From 22 to 32 seconds after release of TEST INITIATE switch FREQ GEN NO GO INDICATIONS lamp illuminated.	If lamp not illuminated, remove and replace circuit card 1A2 or 1A10 sequentially. Following each removal and replacement, repeat electrical checks paragraph 6-12 as required.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
4	Preselector Tuning Test Status (PTTS) circuit	*1.* 115 VAC ON / OFF-OFF *2. Front Panel* TEST POINT SELECTOR: A - 9 B - 11 *3.* Apply ground to TEST POINTS Connector J2. *4. Test Panel* Remove circuit cards 1A3 and 1A4. 5. 115 VAC ON / OFF-ON 6. Depress and release TEST INITIATE switch	None	From 22 to 32 seconds after release of TEST INITIATE switch INTL CONT NO GO INDICATIONS lamp illuminated.	Same as 3.
5	Power Amplifier Video Status (PAVS) circuit	*Front Panel* Remove ground from TEST POINTS Connector J2. TEST POINT SELECTOR: A - 10 B - 3 Apply chassis ground to TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	From 22 to 32 seconds after release of TEST INITIATE switch PWR AMP and RNG CMPTR NO GO INDICATIONS lamps illuminated	If lamp not illuminated, remove and replace circuit card 1A2 or 1A10 sequentially. Following each removal and replacement, repeat electrical checks, paragraph 6-12 as required.
6	Same as 5	*Front Panel* Remove ground from TEST POINTS Connector J2. Depress and release TEST INITIATE switch	None	From 22 to 32 seconds after release of TEST INITIATE switch RNG CMPTR NO GO INDICATIONS lamp illuminated.	Same as 5.

ab. Receiver Status Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Receiver Status (RST) complement circuit	*1. Front Panel* TEST POINT SELECTORS: A - 6 B - 7 Apply chassis ground to TEST POINTS Connector J2. *2.* Set OSCILLOSCOPE AN / USM-281A using X10 probe to measure less than 0.4 vdc.	Test Point Strip TPC-16	Less than 0.4 vdc ..	If normal voltage is not present, remove and replace circuit card 1A2. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*1. Front Panel* Remove ground from TEST POINTS Connector J2. *2.* Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	2.4 to 5.2 vdc ..	Same as 1.

ac. Bearing Valid Command Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Bearing Valid Command (BVC) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 3 B - 12 Apply chassis ground to TEST POINTS Connector J2.	Test Point Strip TPD-9	2.4 to 5.2 vdc ..	If normal voltage is not present, remove and replace circuit card 1A2. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*2.* Set OSCILLOSCOPE AN / USM-281A using X10 probe 2 to 6 vdc.	Same as 1	Less than 0.4 vdc ..	Same as 1.
		1. Front Panel Remove ground from TEST POINTS Connector J2. *2.* Set Oscilloscope to measure less than 0.4 vdc.			

ad. Range Short Memory Circuitry Troubleshooting.

Item No.	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Range Short Memory (RSM) circuit	*1. Front Panel* TEST POINTS SELECTORS: A - 2 B - 4 Apply chassis ground to TEST POINTS Connector J2. 2. Set OSCILLOSCOPE AN / USM-281A using X10 probe to measure 2 to 6 vdc.	Test Point Strip TPC-15	2.4 to 5.2 vdc ..	If normal voltage is not present, remove and replace circuit card 1A2. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*1. Front Panel* Remove ground from TEST POINTS Connector J2. 2. Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Less than 0.4 vdc ..	Same as 1.

ae. Auxiliary Bearing Valid Circuitry Troubleshooting.

Item No	Item checked	Test procedures	Point of measurement	Normal reading	Corrective action
1	Auxiliary Bearing Valid Test (AVT) circuit	*1. Front Panel* TEST POINT SELECTORS: A - 3 B - 10 Apply chassis ground to TEST POINTS Connector J2. 2. Set OSCILLOSCOPE AN / USM-281A using X10 probe to measure 2 to 6 vdc.	Test Point Strip TPD-8	2.4 to 5.2 vdc ..	If normal voltage is not present, remove and replace circuit card 1A2. Repeat electrical checks, paragraph 6-12.
2	Same as 1	*1. Front Panel* Remove ground from TEST POINTS Connector J2. 2. Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Less than 0.4 vdc ..	Same as 1.

Section II. MAINTENANCE OF TEST PANEL

6-7. General

This section covers the repair procedures of the test panel at the general support level of maintenance. The repairs consist of the removal and replacement of assemblies and plug-in circuit cards as authorized by the Maintenance Allocation Chart.

6-8. Removal Procedures

The following procedures apply to the removal of assemblies and plug-in circuit cards in the tent set. For location of components refer to figures 6-1 and 6-2.

a. Test Panel. For removal of the test panel from the combination case, refer to paragraph 2-3 b (1) through (4).

b. Plug-In Circuit Cards 1A1 Through 1A10.

(1) Remove test panel from combination case.

(2) Lift extractors on circuit card.

(3) Pull circuit card up and out from test panel.

b. Power Supply 1PS1.

(1) Set test panel on its side with power supply facing away from operator.

(2) Disconnect connector P1 (fig. 6-1).

(3) Remove eight screws and attaching hardware securing power supply to chassis.

(4) Lift power supply out from the test panel.

d. Coupler Filter 1FL2.

(1) Set test panel on its side with coupler filter facing away from bench.

(2) Disconnect two cables.

(3) Remove four screws securing coupler f filter to mounting bracket.

(4) Pull coupler out from front panel and up out from test panel.

e. Bearing Distance Heading Indicator ID-663C/U.

(1) Disconnect connector P2 (fig. 6-1).

(2) Remove four screws and attaching hardware securing indicator to front panel.

(3) Remove three screws and attaching hard ware securing indicator mounting bracket to chassis.

(4) Lift indicator and bracket out from test panel.

(5) Loosen bracket screw securing bracket around indicator.

(6) Slide indicator out from bracket.

f. Control Unit.

(1) Loosen four captive screws securing RADIO SET CONTROL to front panel.

(2) Pull control unit out from front panel.

6-9. Replacement Procedures

The following procedures apply to the replacement of assemblies and plug-in circuit cards removed from the test set.

a. Control Unit.

(1) Insert control unit in aperture on front panel.

(2) Secure RADIO SET CONTROL by tightening four captive screws.

b. Bearing Distance Heading Indicator ID-663C/U.

(1) Slide bracket assembly over indicator.

(2) Secure indicator to front pane! with four screws and attaching hardware.

(3) Secure indicator bracket to chassis with three screws and attaching hardware.

(4) Tighten screw securing bracket around indicator.

(5) Reconnect connector P2.

c. Coupler Filter 1FL2.

(1) Install coupler filter in position with TACAN RF connector J1 inserted through front panel.

(2) Secure coupler filter to mounting bracket with four screws.

(3) Reconnect two cables.

d. Power Supply 1PS1.

(1) Place power supply in position and secure to chassis with eight screws.

(2) Reconnect connector P1.

e. Plug-In Circuit Cards 1A1 Through 1A10.

(1) Insert circuit card in position in card rack.

(2) Secure by closing extractors.

(3) Replace test panel in combination case.

f. Test Panel. For replacement of test panel in combination case, refer to paragraph 2-6.

Section III. GENERAL SUPPORT TESTING PROCEDURES

6-10. General

a. Testing procedures are prepared for use by Signal Field Maintenance Shops and Signal Service. Organizations responsible for general support maintenance of electronic equipment to determine acceptability of the repaired equipment, These procedures establish specific requirements that repaired equipment must meet before it is returned to the using organization.

b. Comply with the instructions preceding each chart before proceeding to the chart. Perform each step in sequence. Do not vary the sequence. For each step, perform all the actions required in the Control settings columns; then perform each specific test procedure and verify it against its performance standard.

c. If any defects are noted during physical inspections, repairs will be made within the capabilities of general support level maintenance. Any defects beyond the scope of general support maintenance will be referred to depot maintenance.

d. If any of the functional tests fail to meet performance standard requirements. refer to the troubleshooting procedures in section II. The troubleshooting procedures are listed in the same sequential order as the electrical tests in this section.

e. Test equipment required is listed preceding the electrical test procedures.

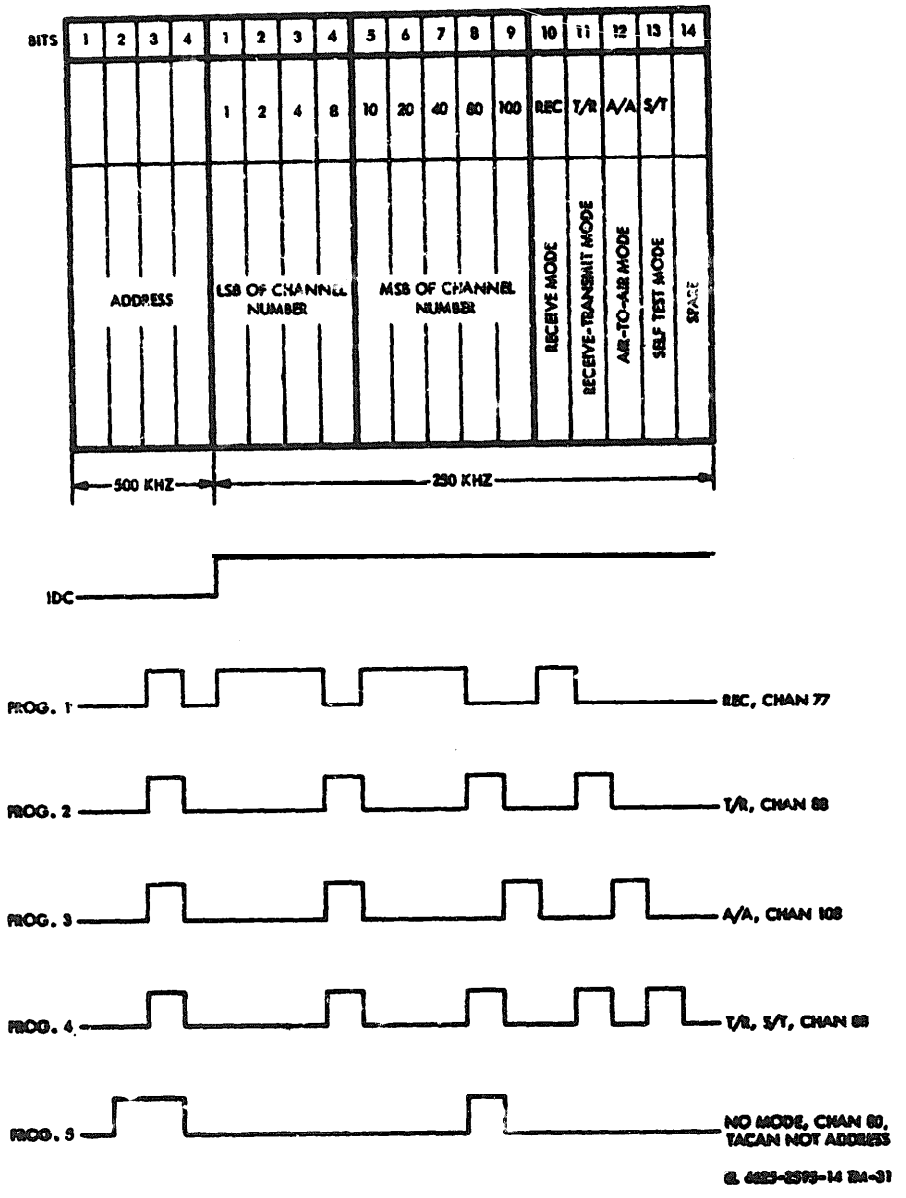


Figure 6-5. Program selector control word output.

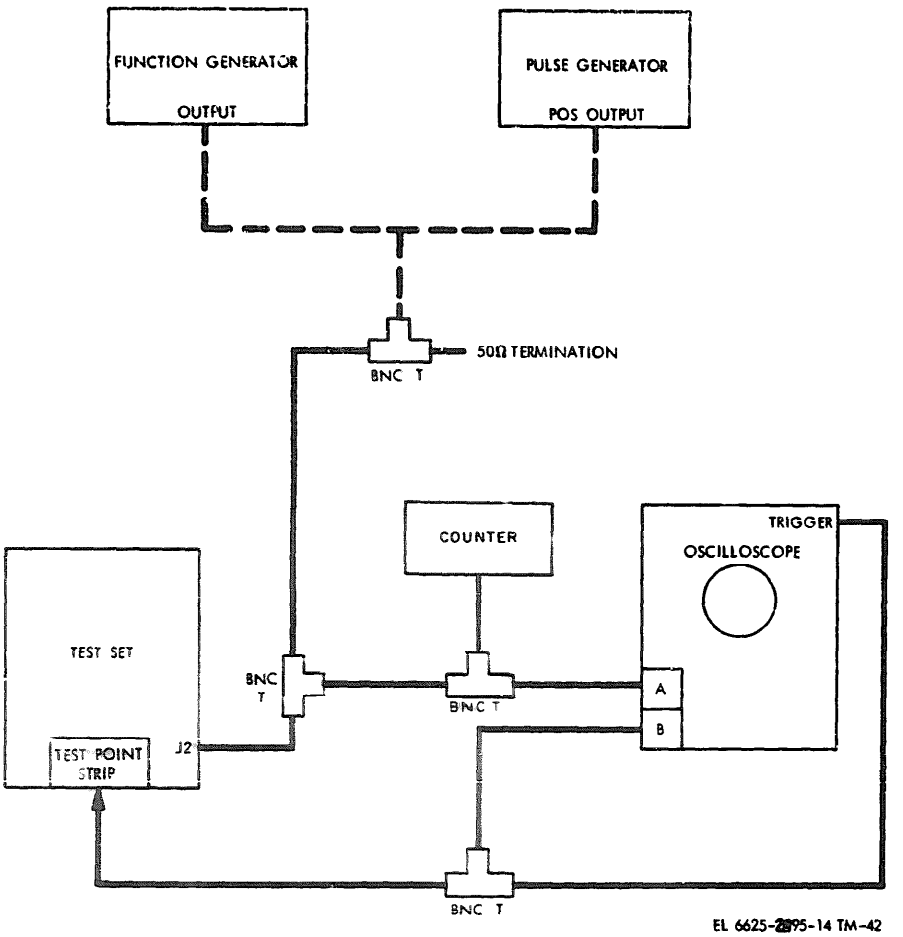


Figure 6-6. Test Setup with function generator or pulse generator.

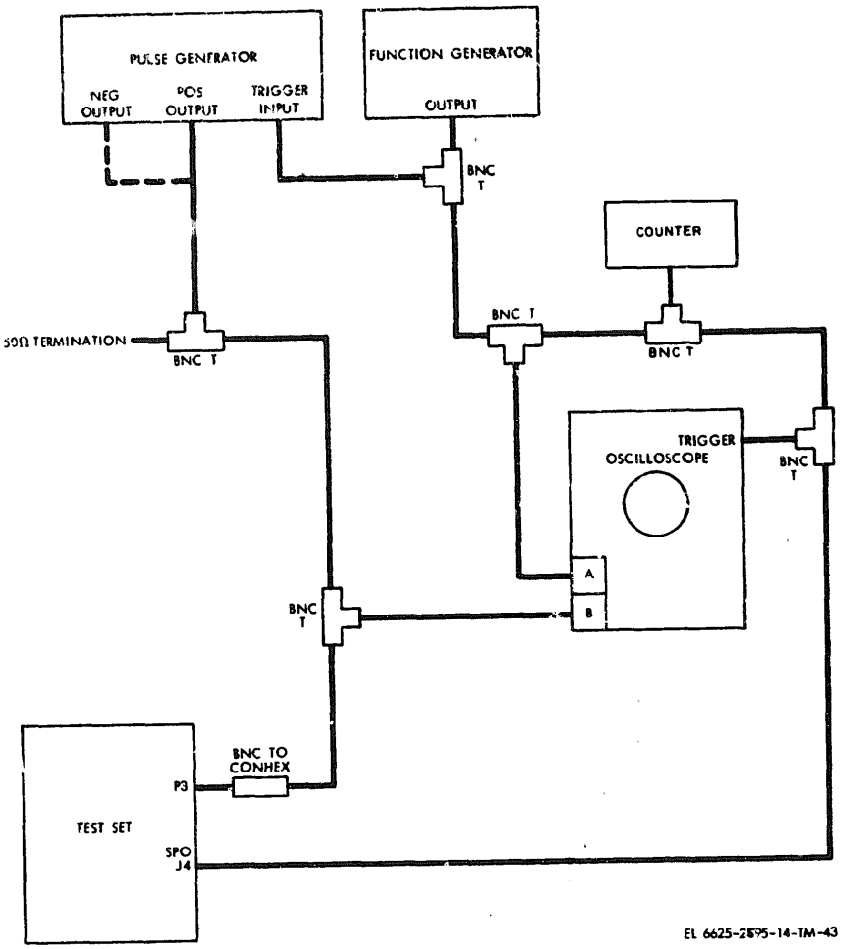


Figure 6-7. Test Setup for power amplifier and suppression pulse test.

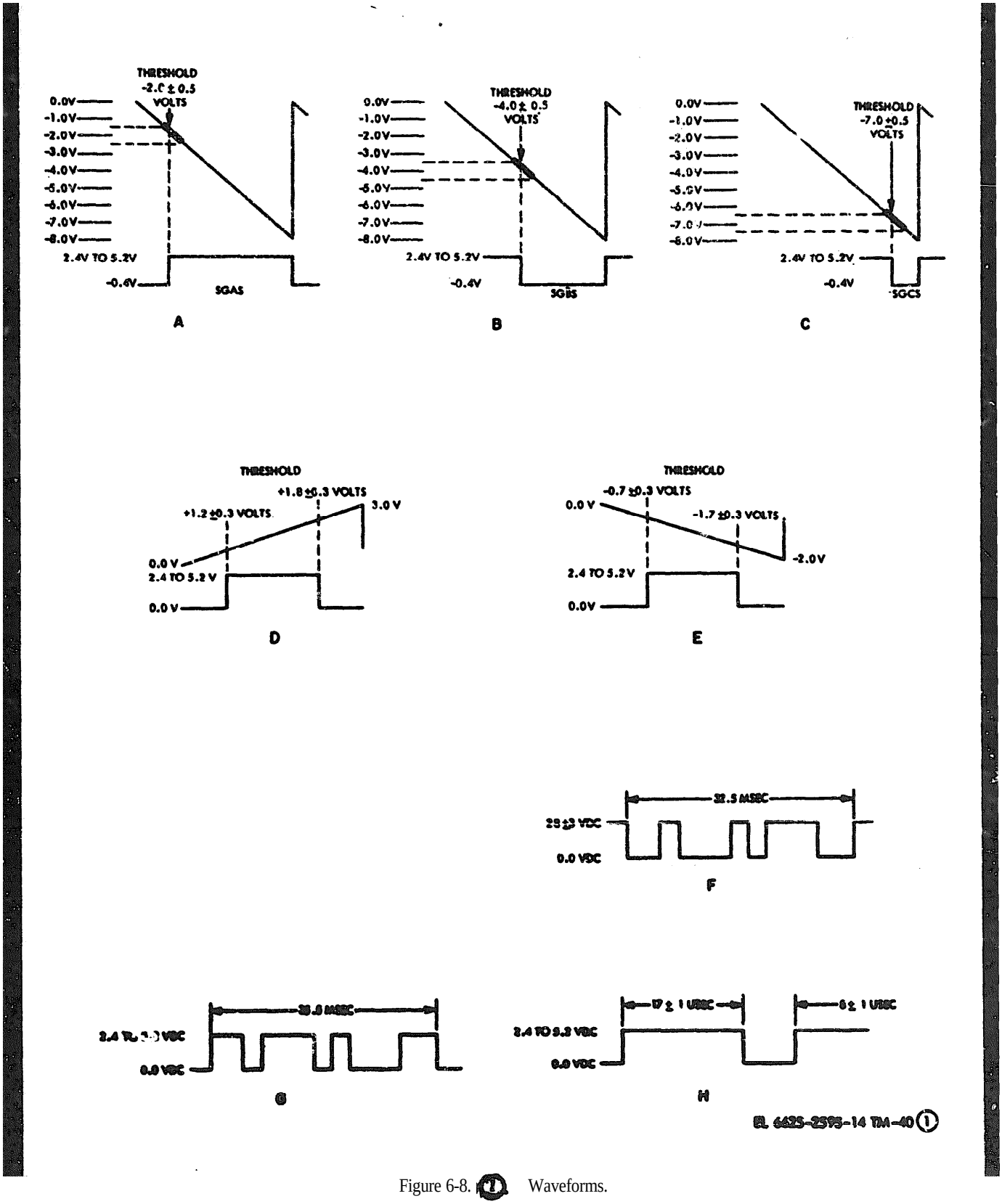


Figure 6-8. (1) Waveforms.

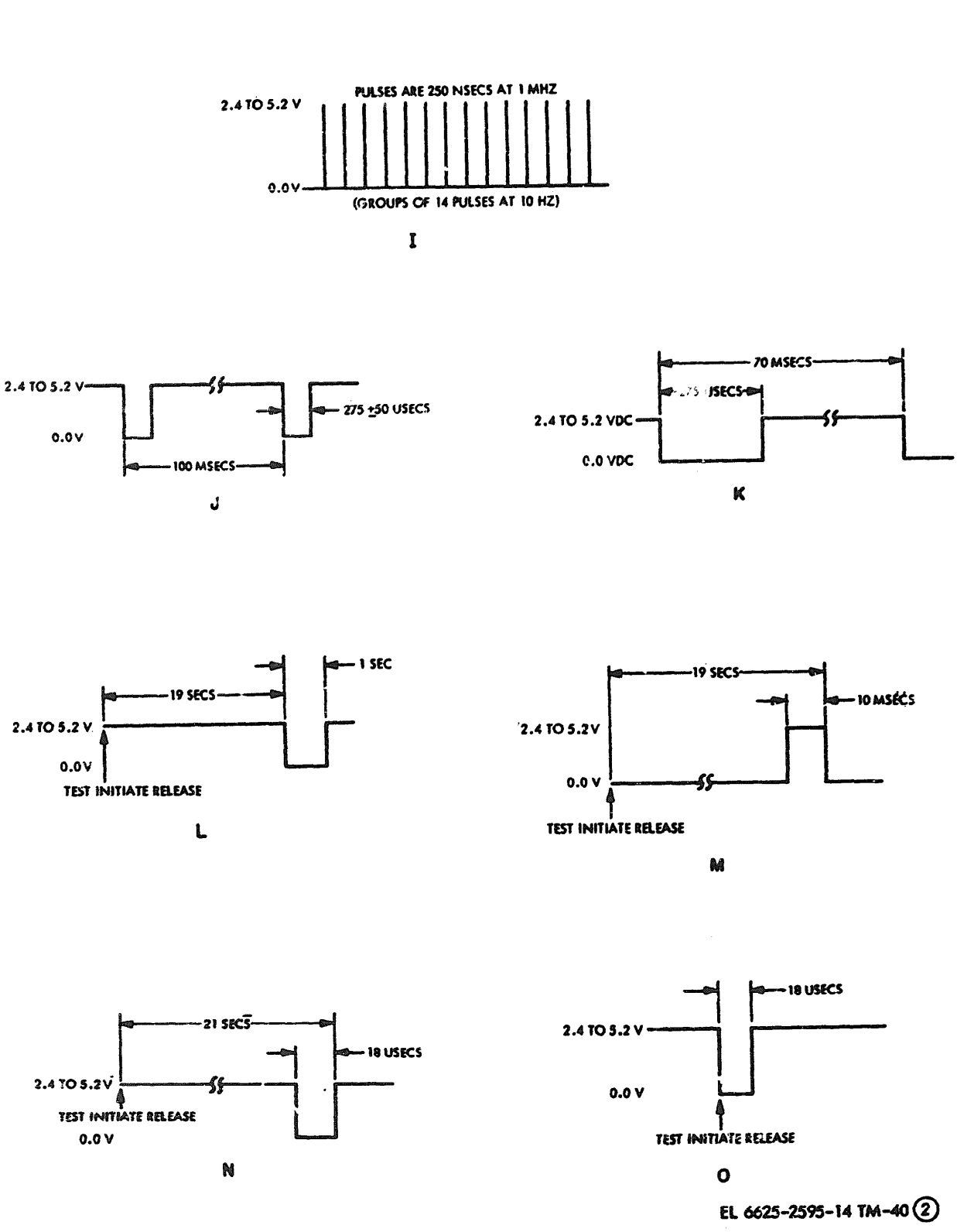


Figure 6-3 (2) Waveforms.

f. The performance standards listed in the tests are based on the assumption that the applicable modification work orders listed in DA Pam 310-7 have been performed.

6-11. Test Panel Physical Tests and Inspection

a. Test Equipment Required. None required.

b. Test Connections and Conditions. None.

c. Test Panel Physical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	N/A	*a.* Inspect for attached maintenance tags.	*a.* No maintenance tags attached.
			b. Inspect front panel for damage or missing parts.	*b.* No damage evident or missing parts.
			c. Inspect front panel surfaces for condition of paint.	*c.* No bare metal showing.
			d. Inspect legibility of name plate.	*d.* Lettering on name plate will be legible.
			e. Inspect front panel for loose or missing screws, washers, or nuts.	*e.* Screws, washers, and nuts must be secure, none missing.
2	N/A	N/A	*a.* Remove test panel from case or rack (para 2-3b(1) through (4)) and check that all plugs are securely connected to the proper connector.	*a.* Plugs connected properly.
			b. Check that all the plug-in cards are seated properly.	*b.* Plug-in cards are seated properly.
			c. Rotate all switches through their limits of travel.	*c.* Switches operate freely without binding or excessive looseness.
			d. Rotate all controls through their limits of travel.	*d.* Controls operate freely without binding or excessive looseness.
			e. Replace front panel in rack or case and secure the captive screws.	*e.* All captive screws secured.

6-12. Test Panel Electrical Tests

a. *Test Equipment and Materials Required.*

Oscilloscope.
Function generator.
Multimeter.
Pulse generator.
BNC T connector.
BNC T-50 0 connector.
Conhex BNC connector.
Headset.
Counter.

b. Teat Connections and Conditions. Remove the test panel from the combination case (para 2-3 b (1) through (4)). Connect the equipment as shown in figures 6-6 and 6-7.

CAUTION

Remove TEST POINTS input signal after each test and before moving TEST POINTS selector switch or damage to the Test Set will result.

c. Self-Test Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*a. Front Panel* 115 VAC ON/OFF—OFF DISPLAY SELECT-DIGITAL INTERFACE FUNCTION SELECT-RANGE PROGRAM SELECT - 1 TEST POINT SELECTORS: A - 1 B - 1 C - 1 *b. RADIO SET CONTROL* CHAN - 1 X/Y MODE - X Operation Mode Switch - AUTO	*a.* None *b.* Set 115 VAC ON/OFF switch to ON and observe PWR ON lamp and TTM meter.	*a.* None *b.* PWR ON lamp illuminated and TTM meter running.
2	N/A	Same as 1	Observe TEST SET NO/GO indicator.	TEST SET NO/GO indicator not illuminated.
3	N/A	*Front Panel* 115 VAC ON/OFF - OFF	*a.* Remove circuit card 1A7. *b.* Set 115 VAC ON/OFF switch to ON and observe TEST SET NO/GO indicator.	*a.* None *b.* TEST SET NO/GO indicator illuminated.
4	N/A	*Front Panel* 115 VAC ON/OFF - OFF	*a.* Reinstall circuit card 1A7. Set 115 VAC ON/OFF switch to ON. *b.* Depress and hold TEST INITIATE switch and observe front panel lamps and indicators.	*a.* TEST SET NO GO indicator not illuminated. *b.* All lamps and indicators illuminated except one half of UPDATE/STOP and SELF TEST HOLD/SELF TEST RELEASE indicators.
5	N/A	*Front Panel* 115 VAC ON/OFF - ON	Release TEST INITIATE switch and: *1.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *2.* After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*a.* TEST INITIATE switch indicator goes out after switch is released. *b.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *c.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
6	N/A	Same as 5	Depress SELF TEST HOLD/-SELF TEST RELEASE switch several times and observe indicator lamps.	Both segments alternately illuminate.
7	N/A	Same as 5	Depress UPDATE/STOP switch several times and observe indicator lamps.	Both segments alternately illuminate.

d. Power Supply Output Electrical Test Procedures.

NOTE

The following electrical tests of the power supply are not covered in self-test checks in paragraph 6-*b. c.*

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Set multimeter ME-26/U to 30 VAC scale.	*Front Panel:* 115 VAC ON/OFF - ON	Measure AC voltage at Terminal Board TB1A-4 (figure 6-3)	Voltage should read 10.2 ± 2 vac.

e. Control Unit Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*a. RADIO SET CONTROL* CHAN - 125 *b. Front Panel* DISPLAY SELECT--CONTROL UNIT	Observe CONTROL Display lamps.	CONTROL Display lamps A/A, T/R, 80, 40, 4, and 1 illuminated.
2	N/A	*RADIO SET CONTROL:* CHAN - 87 X/Y MODE - Y Operation Mode Switch - REC	Observe CONTROL Display lamps.	*a.* CONTROL Display lamps Y MODE 80, 4, 2, and 1 illuminated. *b.* A/A, T/R and REC not illuminated.
3	N/A	*RADIO SET CONTROL* CHAN - 47 Operation Mode Switch - T/R	Observe CONTROL Display lamps.	CONTROL Display lamps T/R, Y MODE, 40, 4, 2, and 1 illuminated.
4	N/A	*RADIO SET CONTROL* CHAN - 38 X/Y MODE - X Operation Mode Switch - A/A	Observe CONTROL Display lamps.	Display lamps A/A, 20, 10, and 8 illuminated. Y MODE lamp is not illuminated.
5	N/A	Same as 4	Depress and hold BIT pushbutton. Observe ECM WARN indicator and the NO GO and GO STATUS indicators and CONTROL Display lamps.	*a.* ECM WARN, NO GO, and GO STATUS indicators illuminated. *b.* CONTROL Display lamps S/T, A/A, 20, 10, and 8, illuminated.
6	N/A	Same as 4	Release BIT pushbutton and observe ECM WARN, NO GO, and GO STATUS indicators.	ECM WARN, NO GO, and GO STATUS indicators not illuminated for two seconds.
7	N/A	Same as 6	2 seconds after release of BIT pushbutton observe the following indicators on the RADIO SET CONTROL. NO-GO STATUS	Indicator lamps should illuminate as follows: Illuminates for two seconds, two seconds after release of BIT pushbutton.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
7 (Cont'd)			GO STATUS	Illuminates for two seconds, four seconds after release of BIT push-button.
			ECM WARN	Illuminates for two seconds, six seconds after release of BIT push-button.
8	N / A	Same as 6	3 seconds after the release of the BIT pushbutton, observe ECM WARN, NO GO, and GO STATUS indicators.	ECM indicator and the NO GO STATUS indicators not illuminated.
9	N / A	*RADIO SET CONTROL:* VOL - Centered	Insert headset jack in ID TONE test panel jack J8.	1 KHz tone audible in headset.
10	N / A	Same as 9	Vary VOL control fully cw then and ccw and listen to 1 KHz tone in headset.	1 KHz tone loud at full cw position to off at full ccw position.

f. Program Selection Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	OSCILLOSCOPE AN / USM-281A VERTICAL DEFLECTION: 1 Volt / CM TIME BASE: 5 μsecs / CM +EXT Sync.	*a. Front Panel* DISPLAY SELECT - DIGITAL INTERFACE TEST POINT SELECTORS: A - 11 B - 2 C - 2 PROGRAM SELECT - 1 *b.* RADIO SET CONTROL Operation Mode - AUTO	*a.* Connect Oscilloscope Channel A to TEST POINT connector J2.	*a.* None
			b. Depress and release ENTER switch and verify CONTROL WORD on Oscilloscope (Adjust external sync for sweep as necessary).	*b.* Refer to figure 6-5 (Prog. 1)
2	Same as 1	*Front Panel:* PROGRAM SELECT - 2	Same as 1	Refer to figure 6-5 (Prog. 2)
3	Same as 1	*Front Panel:* PROGRAM SELECT - 3	Same as 1	Refer to figure 6-5 (Prog. 3)
4	Same as 1	*Front Panel:* PROGRAM SELECT - 4	Same as 1	Refer to figure 6-5 (Prog. 4)
5	Same as 1	*Front Panel:* PROGRAM SELECT - 5	*a.* Same as 1 ..... *b.* Same as 1 ..... *c.* Disconnect oscilloscope from TEST POINT connector J2.	*a.* Refer to figure 6-5 (Prog. 5)

g. Multiplexer Display Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel* FUNCTION SELECT - RANGE TEST POINT SELECTORS: A-11 B-7 DISPLAY SELECT - DIGITAL INTERFACE UPDATE/STOP - UPDATE	Observe CONTROL Display lamps.	All CONTROL Display lamps illuminated except Y MODE.
2	N/A	Same as 1	Apply chassis ground to TEST POINTS connector J2 and observe RANGE Display lamps.	All RANGE Display lamps not illuminated.
3	N/A	*Front Panel* UPDATE/STOP - STOP	Remove ground from TEST POINTS connector J2 and observe RANGE Display lamps.	None - All RANGE Display lamps not illuminated.
4	N/A	*Front Panel* UPDATE/STOP - UPDATE	Observe RANGE Display lamps.	All RANGE Display lamps illuminated except 0.
5	Set Oscilloscope for a 10 Hz squarewave 2.4 to 5.2V amplitude. OSCILLOSCOPE AN/USM-28/A VERTICAL DEFLECTION: 1 Volt/CM TIME BASE: 10ms/CM	*Front Panel* TEST POINT SELECTORS: C-5 FUNCTION SELECT - CONTROL	Using the Oscilloscope, measure the voltage at TEST POINTS connector J3.	Less than 0.4 vdc.
6	Same as 5	*Front Panel:* TEST POINT SELECTORS: C-6	Same as 5	10 ±0.1 Hz square wave with amplitude 2.4 to 5.2 vdc.
7	Same as 5	*Front Panel:* FUNCTION SELECT - BEARING	Same as 5	Less than 0.4 vdc.
8	Same as 5	*Front Panel:* TEST POINT SELECTORS: C-5	Same as 5	10 ±0.1 Hz square wave with amplitude 2.4 to 5.2 vdc.
9	Same as 5	*Front Panel:* FUNCTION SELECT - RANGE	Same as 5	Same as 8
10	Same as 5	*Front Panel:* TEST POINT SELECTORS: C-6	*a.* Same as 5 ..... *b.* Remove Oscilloscope from TEST POINTS connector J3.	*a.* Same as 8 *b.* None
11	N/A	*Front Panel:* TEST POINT SELECTORS: A - 11 B - 3	Apply chassis ground to TEST POINTS connector J2 and observe DATA VALID indicator.	DATA VALID indicator not illuminated.
12	N/A	Same as 11	Remove ground from TEST POINTS connector J2 and observe DATA VALID indicator.	DATA VALID indicator illuminated.

h. Range Display Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel:* DISPLAY SELECT - RANGE TEST POINT SELECTORS: A - 1 B - 1	Observe RANGE Display lamps.	All RANGE Display lamps illuminated except 0.
2	N/A	Same as 1	Apply chassis ground to TEST POINTS, connector J2 and observe RANGE Display lamps.	All RANGE Display lamps illuminated except 0 and 204.8 miles (MSB).
3	N/A	*Front Panel* TEST POINT SELECTORS: A-1 B-2 thru 12	*a.* Observe RANGE Display lamps (102.4 through 0.1 miles) while rotating TEST POINT SELECTOR B. *b.* Remove ground from TEST POINTS connector J2.	*a.* One RANGE Display lamp not illuminated at each position. *b.* All RANGE Display lamps (102.4 through 0.1 miles) are illuminated.
4	N/A	*Front Panel* TEST POINT SELECTORS: A - 2 B - 1	Apply chassis ground to TEST POINTS connector J2 and observe RANGE Display lamps.	All RANGE Display lamps illuminated except 0 and 0.05 miles.
5	N/A	*Front Panel* TEST POINT SELECTORS: A-2 B-2	*a.* Observe RANGE Display lamps. *b.* Remove ground from TEST POINTS connector J2.	*a.* All RANGE Display lamps except 0 and 0.025 miles are illuminated. *b.* None

i. Bearing Display Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel* TEST POINT SELECTORS: A-2 B-9 DISPLAY SELECT - BEARING	Observe BEARING Display lamps.	All BEARING Display lamps illuminated except zeros (0's)
2	N/A	Same as 1	Apply chassis ground to TEST POINTS connector J2 and observe BEARING Display lamps.	All BEARING Display lamps illuminated except 256.0 degrees (MSB) and zeros (0's)
3	N/A	*Front Panel* TEST POINT SELECTORS: A-2 B-9 through 12	*a.* Observe BEARING Display lamps (256.0 through 32.0 degrees) while rotating TEST POINT SELECTOR B. *b.* Remove ground from TEST	*a.* One BEARING Display lamp not illuminated at each position. *b.* All BEARING Display lamps, except zeros (0's), are illuminated.
4	N/A	*Front Panel* TEST POINT SELECTORS: A-3 B-1	Apply chassis ground to TEST POINTS connector J2 and observe BEARING Display lamps.	All BEARING Display lamps illuminated except 16.0 and 0.
5	N/A	*Front Panel:* TEST POINT SELECTORS: A-3 B-2 through 7	*a.* Observe BEARING Display lamps (8.0 through 0.25 degrees) while rotating TEST POINT SELECTOR B. *b.* Remove ground from TEST POINTS connector J2.	*a.* One BEARING Display lamp not illuminated at each position. *b.* None

j. Control Word Display Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel:* DISPLAY SELECT—CONTROL WORD TEST POINT SELECTORS: A-4 B-1	Observe CONTROL Display lamps.	All CONTROL Display lamps illuminated except ECCM, REC, T/R, and 100.
2	N/A	Same as 1	Apply chassis ground to TEST POINTS connector J2 and observe CONTROL Display lamps.	All CONTROL Display lamps illuminated except ECCM, T/R, REC, 100, and 80.
3	N/A	*Front Panel:* TEST POINT SELECTORS: A-4 B-2 through 12	*a.* Observe CONTROL Display lamps (40 through S/T) while rotating TEST POINT SELECTOR B.	*a.* The following CONTROL Display lamps not illuminated in the indicated selected positions: 2—ECCM, T/R, REC, 100, and 40 3—ECCM, T/R, REC, 100, and 20 4—ECCM, T/R, REC, 100, and 10 5—ECCM, T/R, REC, 100, and 8 6—ECCM, T/R, REC, 100, and 4 7—ECCM, T/R, REC, 100, and 2 8—ECCM, T/R, REC, 100, and 1 9—ECCM, T/R, A/A, and 100 10—ECCM, REC, and 100 11—ECCM, T/R, REC, 100, and Y MODE 12—ECCM, T/R, REC, S/T, and 100
			b. Remove ground from TEST POINTS Connector J2.	*b.* None

k. Digital Interface Word Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using Oscilloscope AN / USM-281A. Set Function Generator SG-321 / U for a + 20V square wave output Set 3304A - Sweep Width - 5 Frequency - 4 HZ Range - X1 Set 3300A Range X100 Channel PLUG-IN	*Front Panel:* DISPLAY SELECT—SERIAL DATA FUNCTION SELECT - CONTROL TEST POINT SELECTORS: A-5 B-6	*a.* Connect equipment as shown in figure 6-6. *b.* Vary frequency on 3304A from 1 to 10 Hz and observe CONTROL Display lamps. *c.* Disconnect Function Generator from Test Points connector J2.	*a.* None *b.* All CONTROL Display lamps will blink except: ECCM, REC, 100. *c.* None

l. Antenna Switch / Drive Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N / A	*Front Panel* TEST POINT SELECTORS: A-5 B-1	Observe ANT DRIVE indicator.	ANT DRIVE indicator not illuminated.
2	N / A	Same as 1	*a.* Apply chassis ground to TEST POINTS Connector J2 and observe ANT DRIVE indicator. *b.* Remove ground from TEST POINTS connector J2.	*a.* ANT DRIVE indicator illuminated. *b.* ANT DRIVE indicator not illuminated.
3	Using OSCILLOSCOPE AN / USM-381A, set FUNCTION GENERATOR SG-321 / U for a 1 Hz (1 sec) +10V squarewave output. Set 3304A: Sweep width - OFF Set 3300A: Channel: PLUG-IN	*Front Panel* TEST POINT SELECTORS: A-12 B-5	*a.* Connect Function Generator to TEST POINTS Connector J2 (figure 6-6) and observe ANT SWITCH indicator. *b.* Disconnect Function Generator TEST POINTS connector J2.	*a.* ANT SWITCH indicator illuminates at a 1 Hz rate. *b.* ANT SWITCH indicator stops illuminating at 1 Hz rate.

m. Bearing and Range Display Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel:* TEST POINT SELECTORS: A - 12 B - 1	Observe BEARING FLAG DRIVE indicator.	BEARING FLAG DRIVE indicator not illuminated.
2	N/A	Same as 1	*a.* Apply chassis ground to TEST POINTS connector J2 and observe BEARING FLAG DRIVE indicator. *b.* Remove ground from TEST POINTS connector J2.	*a.* BEARING FLAG DRIVE indicator illuminated. *b.* None.
3	N/A	*a. Front Panel* 115 VAC ON/OFF - OFF *b. Test Panel:* Disconnect P2 from ID-663 C/U. *c. Front Panel:* 115 VAC ON/OFF - ON TEST POINT SELECTORS A - 12 B - 2	Observe RANGE FLAG DRIVE indicator.	RANGE FLAG DRIVE indicator not illuminated.
4	N/A	Same as 3	*a.* Apply chassis ground to TEST POINTS connector J2 and observe RANGE FLAG DRIVE indicator. *b.* Remove ground from TEST POINTS connector J2. *c.* Set 115 VAC ON/OFF switch to OFF. *d.* Reconnect P2 to ID-663C/U. *e.* Set 115 VAC ON/OFF switch to ON.	*a.* RANGE FLAG DRIVE indicator illuminated. *b.* RANGE FLAG DRIVE indicator not illuminated. *c.* None.
5	N/A	*Front Panel:* TEST POINT SELECTORS: A-2 B-3	Observe RANGE VALID in indicator.	RANGE VALID indicator not illuminated.
6	N/A	Same as 5	*a.* Apply chassis ground to TEST POINTS connector J2 and observe RANGE VALID indicator. *b.* Remove ground from TEST POINTS connector J2.	*a.* RANGE VALID indicator illuminated. *b.* RANGE VALID indicator not illuminated.
7	N/A	*Front Panel:* TEST POINT SELECTORS: A-3 B-11	Observe BEARING VALID indicator.	BEARING VALID indicator not illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
8	N/A	Same as 7	*a.* Apply chassis ground to TEST POINTS connector J2 and observe BEARING VALID indicator. *b.* Remove ground from TEST POINTS connector J2.	*a.* BEARING VALID indicator illuminated. *b.* BEARING VALID indicator not illuminated.

n. Identity Tone Verification Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A, set FUNCTION GENERATOR SG-321/U for a 1.1 KHz (909 μ secs) 15V square wave output.	*Front Panel:* TEST POINT SELECTORS: A-6 B-4	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel:* TEST POINT SELECTORS: A-11 B-1	With the Oscilloscope measure voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and counter set the Function Generator for a 1.35 KHz (740 μ secs), 15V squarewave output.	*Front Panel* TEST POINT SELECTORS: A-6 B-4	*a.* Connect the Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE switch indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
6	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel:* TEST POINT SELECTORS: A-11 B-1	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.
7	Using the Oscilloscope and Counter set Function Generator for 1.7 KHz (588 μ secs) 15V squarewave output.	*Front Panel:* TEST POINT SELECTORS: A-6 B-4	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 7	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel:* TEST POINT SELECTORS: A-11 B-1	Using Oscilloscope, measure voltage at TEST POINTS connector J2.	Less than 0.4 vdc.

o. Slow Gain Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel* TEST POINT SELECTORS: A-9 B-7	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
2	N/A	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indictor.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
3	Set OSCILLOSCOPE AN/USM-271A to measure 2 to 6 vdc.	Same as 1	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	*a.* 2.4 vdc to 5.2 vdc.
4	Using the Oscilloscope set FUNCTION GENERATOR SG-321/U for a 0.3 Hz (3.33 secs) 0 to —8V sawtooth wave output.	*Front Panel* TEST POINT SELECTORS: A-5 B-12	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
6	Set Oscilloscope to measure less than 0.4 vdc	*Front Panel* TEST POINT SELECTORS: A-9 B-7	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
7	*a.* Set Oscilloscope to measure 0 to 6 vdc.	*Front Panel:* TEST POINT SELECTORS: A-5 B-12	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6).	*a.* None.
	b. Set Function Generator for a 3.0 Hz (333 msecs) 0 to —8.0V sawtooth output.		*b.* Using the Oscilloscope observe the voltages at the following test points on the Test Point Strip. (1) TPD-13 (SGAS) (2) TPD-14 (SGBS) (3) TPD-15 (SGCS)	*b.* (1) Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when the input to J2 reaches a threshold of —2 ± 0.5 volts See waveform A, fig. 6-8. (2) Switches from 5.2 vdc to less than 0.4 to 2.4 vdc when the input to J2 reaches a threshold of —4 ± 0.5 volts See waveform B, fig. 6-8.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
7 Cont'd)				(3) Switches from 5.2 vdc to less than 0.4 to 2.4 vdc when input to J2 reaches a threshold of —7 ± 0.5 volts See waveform C, fig. 6-8.
			c. Disconnect Function Generator from TEST POINTS connector J2.	c. None.

p. YIG Tuning Current Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN / USM-281A set FUNCTION GENERATOR SG-321 / U for a 3 Hz, (333 msecs) 0 to 3V sawtooth wave output.	*Front Panel* TEST POINT SELECTORS: A-5 B-4	a. Connect Function Generator to TEST POINTS connector J2 (fig. 6-6).	a. None.
			b. Using the Oscilloscope measure the voltage at Test Point Strip TPD-16.	b. Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when input at J2 reaches threshold of 1.2 ± 0.5 volts and back to less than 0.4 vdc when threshold reaches 1.8 ± 0.5 volts. See waveform D, fig. 6-8.
			c. Disconnect Function Generator from TEST POINTS connector J2.	c. None.

q. Fast Gain Control Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN / USM-281A, set FUNCTION GENERATOR SG-321 / U for a 3.0 Hz (333 msecs) 0 to —2V sawtooth wave.	*Front Panel* TEST POINT SELECTORS: A-6 B-1	a. Connect Function Generator to J2. (fig. 6-6).	a. None.
			b. Using the Oscilloscope observe the voltage at Test Point Strip TPD-17.	b. Switches from less than 0.4 vdc to 2.4 to 5.2 vdc when input to J2 reaches threshold of —0.7 ± 0.3 volts and back to less than 0.4 vdc when input to J2 reaches threshold of —1.7 ± 0.3 volts. See waveform E, fig. 6-8.
			c. Disconnect Function Generator from J2.	c. None.

r. Fine Bearing Modulation Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A set FUNCTION GENERATOR SG-321/U for a 120 Hz (8.33 msecs) 3 VPP Sine Wave output.	*Front Panel* TEST POINT SELECTORS: A-5 B-11	*a.* Connect Function Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure less then 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A-10 B-6	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and Counter set the Function Generator for a 135 Hz (7.41 msecs) 3 VPP Sine Wave	*Front Panel* TEST POINT SELECTORS: A-5 B-11	*a.* Connect Function Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
6	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A-10 B-6	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.
7	Using the Oscilloscope and Counter set the Function Generator for a 140 Hz (7.14 msecs), 3 VPP Sine Wave.	*Front Panel* TEST POINT SELECTORS: A-5 B-11	*a.* Connect the Function Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
8	Same as 7	Same as 7	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator to TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A-10 B-6	Using the oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
s.	*rse Bearing Modulation Electrical Test Procedures.*			
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A, set FUNCTION GENERATOR SG-321/U for a 10 Hz (100 msecs) 3 VPP Sine Wave output.	*Front Panel* TEST POINT SELECTORS: A-5 B-9	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Function Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 2 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 4	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and Counter set the Function Generator for a 15 Hz (66.6 msecs) 3 VPP Sine Wave.	*Front Panel* TEST POINT SELECTORS: A - 5 B - 9	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds.
			b. After 32 ±1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ±1 seconds TEST INITIATE indicator illuminated.
			c. Disconnect Function Generator to TEST POINTS connector J2.	*c.* None.
6	Set Oscilloscope to measure 2 to 6 vdc	*Front Panel* TEST POINT SELECTORS: A - 10 B - 4	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.
7	Using the Oscilloscope and Counter set the Function Generator for a 18 Hz (55.5 msecs) 3 VPP Sine wave.	*Front Panel* TEST POINT SELECTORS: A - 5 B - 9	*a.* Connect Function Generator to TEST POINTS connector J2 (figure 6-6).	*a.* None.
			b. Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*b.* TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 7	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ±1 seconds TEST INITIATE indicator illuminated.
			c. Disconnect Function Generator from TEST POINTS connector J2.	*c.* None.
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 4	Using the oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.

c. Main Reference Bursts Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A, set DATA PULSE TYPE 110B Pulse Generator for a 11 Hz (90.9 msec period), 5 msec positive ECL pulse output. (Use BASELINE and AMPLITUDE Adjusts to set ECL, —1.5 to —0.75 vdc).	*Front Panel* TEST POINT SELECTORS: A-5 B-8	*a.* Connect the Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect pulse generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 8	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and Counter set the Pulse Generator for a 15 Hz (66.6 msec period), 5 msec, positive ECL output pulse. (Use the BASELINE and AMPLITUDE Adjusts to set ECL, —1.5 to —0.75 vdc).	*Front Panel* TEST POINT SELECTORS: A - 5 B - 8	*a.* Connect Pulse Generator to TEST POINTS connector J2 (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS Connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
6	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 8	Using the Oscilloscope measure the voltage the TEST POINTS connector J2.	2.4 to 5.2 vdc.

Step No	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
7	Using the Oscilloscope and Counter set the Pulse Generator for a 20 Hz (50 msec period), 5 msec positive ECL pulse output. (Use the BASELINE and AMPLITUDE Adjusts to set ECL —1.5 to 0.75 vdc).	*Front Panel* TEST POINT SELECTORS: A - 5 B - 8	*a.* Connect Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INTIATE indicator not illuminated.
8	Same as 7	Same as 7	*a.* In 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 8	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.

u. Auxiliary Reference Bursts Electrical Test Procedures.

1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A, set Data Pulse Type 100B Pulse G Generator for a 120 Hz (8.33 msecs period) 0.5 msec positive ECL output pulse. (Use BASELINE and AMPLITUDE adjusts to set ECL —1.5 to —0.75 vdc)	*Front Panel* TEST POINT SELECTORS: A - 5 B - 10	*a.* Connect Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 5	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and Counter set the Pulse Generator for a 135 Hz (7.41 msec period), 0.5 msec positive ECL output pulse. (Use the BASELINE and AMPLITUDE Ajusts to set ECL —1.5 to —0.75 vdc)	*Front Panel* TEST POINT SELECTORS: A - 5 B - 10	*a.* Connect the Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
6		*Front Panel* TEST POINT SELECTORS: A - 10 B - 5	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.
7	Using the Oscilloscope and Counter set the Pulse Generator for a 145 Hz (6.89 msec period), 0.5 msec positive ECL output pulse. (Use the BASELINE and AMPLITUDE Adjusts to set ECL —1.5 to —0.75 vdc)	*Front Panel* TEST POINT SELECTORS: A - 5 B - 10	*a.* Connect Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 7	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 5	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.

a. *First Pulse Valid Electrical Test Procedures.*

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using Oscilloscope AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A set DATA PULSE TYPE 110B Pulse Generator for a 19 Hz (52.6 msec period) 1 μsec, negative ECL output pulse. (Use BASELINE and AMPLITUDE Adjusts to set ECL), —0.75 to —1.6 vdc)	*a. Front Panel* TEST POINT SELECTORS: A - 6 B - 2 *b. Radio Set Control* Operation Mode - A/A	*a.* Connect Pulse Generator to TEST POINTS Connector J2. (figure 6-6).	*a.* None.
			b. Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ±1 seconds TEST INITIATE indicator illuminated.
			c. Disconnect Pulse Generator from TEST POINTS connector J2.	*c.* None.
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS A - 10 B - 9	Using the Oscilloscope measure the voltage at TEST POINTS Connector J2.	Less than 0.4 vdc.
4	Using the Oscilloscope and Counter set the Pulse Generator for a 22 Hz (45.5 msec period) 1 μsec, negative ECL output pulse. (Use the BASELINE and AMPLITUDE Adjusts to set ECL —0.75 to —1.6 vdc)	*Front Panel* TEST POINT SELECTORS: A - 6 B - 2	*a.* Connect the Pulse Generator to TEST POINTS Connector J2. (fig. 6-6).	*a.* None.
			b. Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ±1 seconds TEST INITIATE indicator illuminated.
			c. Disconnect Pulse Generator from TEST POINTS connector J2.	*c.* None.
6	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 9	Using the Oscilloscope measure the voltage at TEST POINTS Connector J2.	2.4 to 5.2 vdc.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
7	Using the Oscilloscope and Counter set the Pulse Generator for a 2.3 KHz. (430 μ secs period). 1 μ sec negative ECL output pulse. (Use the BASELINE and AMPLITUDE Adjusts to set ECL —0.75 to —1.6 vdc)	*Front Panel* TEST POINT SELECTORS: A - 6 B - 2	*a.* Connect Pulse Generator to TEST POINTS, Connector J2. (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 7	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.
9	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 10	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
10	Using the Oscilloscope and Counter set Pulse Generator for a 2.5 KHz (400 μsecs) period 1 μ sec, negative output pulse. (Use BASELINE and AMPLITUDE Adjusts to set ECL —0.75 to —1.6 vdc)	*Front Panel* TEST POINT SELECTORS: A - 6 B - 2	*a.* Connect Pulse Generator to TEST POINTS, Connector J2. (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
11	Same as 10	Same as 10	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.
12	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 10	Using the Oscilloscope measure the voltage at TEST POINTS Connector J2.	2.4 to 5.2 vdc.
13	Using the Oscilloscope and Counter set the Pulse Generator for a 3.3 KHz (303 μsecs period, 1 μsec, negative ECL output pulse. (Use the BASELINE AND AMPLITUDE Adjusts to set ECL —0.75 to —1.6 vdc).	*Front Panel* TEST POINT SELECTORS: A - 6 B - 2	*a.* Connect the Pulse Generator to TEST POINTS Connector J2. (figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
14	Same as 10	Same as 13	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ±1 seconds TEST INITIATE indicator illuminated. *c.* None.
15	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 10	Using the Oscilloscope measure the voltage at TEST POINTS Connector J2.	Less than 0.4 vdc.

w. Composite Video Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A set DATA PULSE TYPE 110B Pulse Generator for a 450 Hz (2.22 msecs) —8V Peak (Reference = 0V) 2.5 μsec negative pulse output.	*Front Panel* TEST POINT SELECTORS: A - 5 B - 7	*a.* Connect Pulse Generator to TEST POINTS Connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE stitch nd observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS Connector J2.	*a.* After 2 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 9 B - 5	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 Vdc.
4	Using the Oscilloscope and Counter set the pulse Generator for a 500 Hz (2 msecs) —8V Peak (reference = 0V) 2.5 μsec negative pulse output.	*Front Panel* TEST POINT SELECTORS: A - 5 B - 7	*a.* Connect Pulse Generator to TEST POINTS connector J2. (Figure 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
6	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 9 B - 5	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.

x. Frequency Synthesizer Status Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN / USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN / USM-207A. set DATA PULSE TYPE 110B Pulse Generator for a 800 Hz (1.25 msec period) 20 μsec pulse width positive ECL pulse output. (Use the BASELINE and AMPLITUDE adjusts to set the ECL —1.5 to —0.75 vdc).	*Front Panel* TEST POINT SELECTORS: A - 6 B - 6	*a.* Connect Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe INTL CONT NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds INTL CONT lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
3	Set Oscilloscope to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 2	Using the Oscilloscope measure voltage at TEST POINTS connector J2.	2.4 to 5.2 Vdc.
4	Using the Oscilloscope and Counter set the Pulse Generator for a 1.1 KHz (909 μsec period) 20 μsec positive pulse width ECL pulse output (Use the BASELINE and AMPLITUDE adjusts to set ECL —1.5 to —0.75 vdc.)	*Front Panel* TEST POINT SELECTORS: A - 6 B - 6	*a.* Connect Pulse Generator to TEST POINTS connector J2 (fig. 6-6). *b.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None. *b.* TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 4	*a.* After 22 seconds observe FREQ Synthesizer NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE indicator. *c.* Disconnect Pulse Generator from TEST POINTS connector J2.	*a.* After 22 seconds FREQ SYNTH lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated. *c.* None.
6	Set Oscilloscope measure less than 0.4 vdc.	*Front Panel* TEST POINT SELECTORS: A - 10 B - 2	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.

y. *First and Second Pulse Command Electrical Test Procedures.*

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A, set DATA PULSE TYPE 110B Pulse Generator for a 1 μsec ECL positive double pulse at 20 Hz (50 msec) with a spacing of 20 μ sec. (Use BASELINE and AMPLITUDE adjusts to set ECL —1.5 to —0.75 vdc.)	*Front Panel* 115 VAC ON/OFF - OFF TEST POINT SELECTORS: A - 2 B - 5 C - 12	*a.* Remove Circuit Card 1A3. *b.* Apply chassis ground to Test Point Strip TPD-4 and TDP-2. *c.* Connect Pulse Generator double pulse output to TEST POINTS connectors J2 and J3 and set 115 VAC ON/OFF to ON (figure 6-6). *d.* Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	*a.* None *b.* None *c.* None *d.* TEST INITIATE indicator not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
3	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using the Oscilloscope measure the voltage at Test Point Strip TPD-18.	Less than 0.4 vdc.
4	Set the Pulse Generator for a 23 Hz (43.4 msec) output.	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
5	Same as 4	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
6	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using the Oscilloscope measure the voltage at Test Strip TDP-18.	Less than 0.4 vdc.
7	Using the Oscilloscope set the pulse spacing of the Pulse Generator to 12 μ sec	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 1	*a.* After 22 seconds, observe PWR AMP and RNG CMPTR NO GO INDICATIONS lamps. *b.* After 32 ± 1 seconds, observe TEST INITIATE switch.	*a.* After 22 seconds, PWR AMP and RNG CMPTR lamps illuminate for 10 seconds. *b.* After 32 ± 1 seconds, TEST INITIATE indicator illuminated.
9	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using the Oscilloscope measure the voltage at Test Point Strip TPD-18. *b.* Remove ground from Test Point Strip TPD-4.	*a.* 2.4 to 5.2 vdc. *b.* None.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
10	Same as 7		Depress and release TEST INITIATE switch.	TEST INITIATE indicator not illuminated.
11	Same as 7	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
12	Set Oscilloscope to measure less 0.4 vdc.	Same as 1	Using the Oscilloscope measure the voltage at Test Point Strip TPD-18.	Less than 0.4 vdc.
13	Using Oscilloscope set the input pulse spacing of the Pulse Generator to 24 μ sec.	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
14	Same as 13	Same as 1	*a.* After 22 seconds observe PWR AMP and RNG CMPTR NO GO INDICATIONS lamps.	*a.* After 22 seconds PWR AMP and RNG CMPTR lamps illuminate for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
15	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at Test Point Strip TPC 18.	*a.* 2.4 to 5.2 vdc.
			b. Remove ground from Test Point Strip TPD-2.	*b.* None
			c. Apply chassis ground to Test Point Strip TPD-3.	*c.* None
16	Same as 13	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
17	Same as 13	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
18	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using the Oscilloscope measure the voltage at Test Point Strip TPD-18.	Less than 0.4 vdc.
19	Using Oscilloscope set the pulse spacing of the Pulse Generator for 36 μ sec.	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
20	Same as 19	Same as 19	*a.* After 22 seconds observe PWR AMP and RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds PWR AMP and RNG CMPTR lamps illuminate for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
21	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at Test Point Strip TPD-18.	*a.* 2.4 to 5.2 vdc.
			b. Apply chassis ground to Test Point Strip TPC-18.	*b.* None
22	Same as 19	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
23	Same as 19	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
24	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using Oscilloscope measure the voltage at Test Point Strip TPD-18.	Less than 0.4 vdc.
25	Set the Pulse Generator for a 150 Hz (6.66 msec) output.	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
26	Same as 25	Same as 1	*a.* After 22 seconds observe PWR AMP and RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds PWR AMP and RNG CMPTR lamps illuminate for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
27	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at Test Point Strip TPD-18.	*a.* 2.4 to 5.2 vdc.
			b. Remove ground from Test Point Strip TPC-18 and TPD-3.	*b.* None.
			c. Disconnect Pulse Generator from TEST POINTS connectors J2 and J3.	*c.* None.
			d. Set 115 VAC ON / OFF switch to OFF.	*d.* None.
			e. Install circuit card 1A3.	*e.* None.

z. Power Amplifier Suppression Pulse Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Using OSCILLOSCOPE AN/USM-281A and ELECTRONIC DIGITAL READOUT COUNTER AN/USM-207A set FUNCTION GENERATOR SG-321/U for a 27 Hz squarewave. Using Oscilloscope sync the Pulse Generator with the Function Generator for a 27 Hz (33 msec period) 3 μsec pulse pair spaced 12 usecs.	*Front Panel* 115 VAC ON/OFF - OFF TEST POINT SELECTORS: A - 10 B - 3	*a.* Remove circuit card 1A3. *b.* Remove connector P3 from Coupler Monitor (figure 6-3). *c.* Apply chassis ground to Test Point Strip TPD-4 and TPD-2. **NOTE** When connecting pulse generator, a 1000 ohms for impedence matching is required. *d.* Connect Pulse Generator via adapter BNC to COHEX to P3 (figure 6-7). **CAUTION** Use care to avoid shorting voltage on nearby capacitors. *e.* Connect Function Generator to SPO Connector J4 (figure 6-7). *f.* Set 115 VAC ON/OFF to ON. *g.* Depress and release TEST INITIATE switch and observe TEST INITIATE switch indicator.	*a.* None. *b.* None. *c.* None. *d.* None. *e.* None. *f.* None. *g.* Indicator lamp not illuminated.
2	Same as 1	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
3	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at TEST POINTS connector J2. *b.* Remove ground from Test Point Strip TPD-4.	*a.* 2.4 to 5.2 vdc. *b.* None.
4	Same as 1	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
5	Same as 1	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp. *b.* After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds. *b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
6	Same as 1	Same as 1	Using the Oscilloscope measure the voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
7	Using Oscilloscope set the pulse pair spacing of Pulse Generator to 24 μsec.	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
8	Same as 7	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
9	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at TEST POINTS connector J2.	*a.* 2.4 to 5.2 vdc.
			b. Remove ground from Test Point Strip TPD-2.	*b.* None.
			c. Apply chassis ground to Test Point Strip TPD-3.	*c.* None.
10	Same as 7	Same as 1	Depress and release TEST INITIATE switch and observe TEST INITIATE indicator.	TEST INITIATE indicator not illuminated.
11	Same as 7	Same as 1	*a.* After 22 seconds observe RNG CMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG CMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
12	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using Oscilloscope measure voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
13	Using Oscilloscope set the Pulse Generator for a spacing of 36 μsecs.	Same as 1	Depress and release TEST INITIATE switch.	TEST INITIATE indicator not illuminated.
14	Same as 13	Same as 1	*a.* After 22 seconds observe RNG COMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG COMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
15	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	Using Oscilloscope measure the voltage at TEST POINTS connector J2.	2.4 to 5.2 vdc.
16	Using Oscilloscope set Pulse Generator pulse amplitude to 4.2 volts.	Same as 1	Depress and release TEST INITIATE switch.	TEST INITIATE indicator not illuminated.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
17	Same as 16	Same as 1	*a.* After 22 seconds observe RNG COMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG COMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
18	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	Using Oscilloscope measure voltage at TEST POINTS connector J2.	Less than 0.4 vdc.
19	Using Oscilloscope and Counter set Pulse Generator for an amplitude of 4.7 volts at 18 Hz (55.5 msecs)	Same as 1	Depress and release TEST INITIATE switch.	TEST INITIATE indicator not illuminated.
20	Same as 19	Same as 1	*a.* After 22 seconds observe RNG COMPTR NO GO INDICATIONS lamp.	*a.* After 22 seconds RNG COMPTR lamp illuminates for 10 seconds.
			b. After 32 ± 1 seconds observe TEST INITIATE switch indicator.	*b.* After 32 ± 1 seconds TEST INITIATE indicator illuminated.
21	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	*a.* Using Oscilloscope measure the voltage at TEST POINTS connector J2.	*a.* Less than 0.4 vdc.
			b. Set 115 VAC ON / OFF switch to OFF.	*b.* None.
			c. Remove inputs to SPO connector J4 and P3.	*c.* None.
			d. Remove ground from Test Point Strip TPD-3.	*d.* None.
			e. Remove CONHEX Adapter from P3 and connect P3 to coupler monitor.	*e.* None.
			f. Reinstall circuit card 1A3.	*f.* None.

aa. Fault Precedence Logic Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	N/A	*Front Panel:* TEST POINT SELECTORS: A - 7 B - 3 115 VAC ON/OFF-ON	*a.* Apply chassis ground to TEST POINTS connector J2. *b.* Depress and release TEST INITIATE switch and observe PWR SPLY NO GO INDICATION lamp 22 to 32 seconds after release of TEST INITIATE switch.	*a.* None. *b.* PWR SPLY NO GO INDICATIONS lamp illuminated.
2	N/A	Same as 1	*a.* Observe PWR SPLY NO GO INDICATIONS lamp 32 ± 1 seconds after release of TEST INITIATE switch. *b.* Remove ground from TEST POINTS Connector J2.	*a.* PWR SPLY NO GO INDICATIONS lamp not illuminated. *b.* None.
3	N/A	*Front Panel* TEST POINT SELECTORS: A - 6 B - 6	*a.* Apply chassis ground to TEST POINTS Connector J2. *b.* Depress and release TEST INITIATE switch and observe FREQ. SYNTH NO GO INDICATIONS lamp 22 to 32 seconds after release of TEST INITIATE switch. *c.* Remove ground from TEST POINTS Connector J2.	*a.* None. *b.* FREQ. SYNTH NO GO INDICATIONS lamp illuminated. *c.* None
4	N/A	*Front Panel* TEST POINT SELECTORS: A - 9 B - 11	*a.* Apply chassis ground to TEST POINTS Connector J2. *b.* Set 115 VAC ON/OFF switch to OFF. *c.* Remove Circuit Cards 1A3 and 1A4. *d.* Set 115 VAC ON/OFF switch to ON. *e.* Depress and release TEST INITIATE switch and observe INTL CONT NO GO INDICATIONS lamp 22 to 32 seconds after release of TEST INITIATE switch. *f.* Remove ground from TEST POINTS Connector J2.	*a.* None. *b.* None. *c.* None. *d.* None. *e.* INTL CONT NO GO INDICATIONS lamp illuminated. *f.* None.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
5	N / A	*Front Panel* TEST POINT SELECTORS: A - 10 B - 3	*a.* Apply chassis ground to TEST POINTS Connector J2.	*a.* None.
			b. Depress and release TEST INITIATE switch and observe NO GO INDICATIONS lamps 22 to 32 seconds after release of TEST INITIATE switch.	*b.* PWR AMP and RNG CMPTR NO GO INDICATIONS lamps illuminated.
			c. Remove ground from TEST POINTS Connector J2.	*c.* None.
6	N / A	Same as 5	*a.* Depress and release TEST INITIATE switch and observe RNG CMPTR NO GO INDICATIONS lamp 22 to 32 seconds after release of TEST INITIATE Switch.	*a.* RNG CMPTR NO GO INDICATIONS lamp illuminated.
			b. Set 115 VAC ON / OFF switch to OFF.	*b.* None.
			c. Reinstall circuit cards 1A3 and 1A4.	*c.* None.

ab. Receiver Status Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Set OSCILLOSCOPE AN / USM-281A, using X10 probe to measure less than 0.4 vdc.	*a. Front Panel* TEST POINT SELECTORS: A - 6 B - 7	*a.* Apply chassis ground to TEST POINTS Connector J2.	*a.* None.
		b. Front Panel 115 VAC ON / OFF - ON	*b.* Using the oscilloscope measure the voltage at Test Point Strip TPC-16.	*b.* Less than 0.4 vdc.
2	Set Oscilloscope to measure 2 to 6 vdc.	Same as 1	*a.* Remove ground from TEST POINTS Connector J2.	*a.* None.
			b. Using the Oscilloscope measure the voltage at Test Point Strip TPC-16.	*b.* 2.4 to 5.2 VDC.

ac. Bearing Valid Command Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Set Oscilloscope AN / USM-281A using X10 probe to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 3 B - 12	*a.* Apply chassis ground to TEST POINTS Connector J2.	*a.* None.
			b. Using the Oscilloscope measure the voltage at Test Point Strip TPD-9.	*b.* 2.4 to 5.2 vdc.
2	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	*a.* Remove ground from TEST POINTS Connector J2.	*a.* None.
			b. Using the Oscilloscope measure the voltage at Test Point Strip TPD-9.	*b.* Less than 0.4 vdc.

ad. Range Short Memory Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Set OSCILLOSCOPE AN/USM-281A using X10 probe to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 2 B - 4	*a.* Apply chassis ground to TEST POINTS Connector J2. *b.* Using the Oscilloscope measure the voltage at Test Point Strip TPC-15.	*a.* None. *b.* 2.4 to 5.2 vdc.
2	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	*a.* Remove ground from TEST POINTS Connector J2. *b.* Using the Oscilloscope measure the voltage at Test Point Strip TPC-15.	*a.* None. *b.* Less than 0.4 vdc.

ae. Auxiliary Bearing Valid Electrical Test Procedures.

Step No.	Control Settings: Test Equipment	Control Settings: Equipment Under Test	Test Procedure	Performance Standard
1	Set OSCILLOSCOPE AN/USM-281A using X10 probe to measure 2 to 6 vdc.	*Front Panel* TEST POINT SELECTORS: A - 3 B - 10	*a.* Apply chassis ground to TEST POINTS Connector J2. *b.* Using the Oscilloscope measure the voltage at Test Point Strip TPD-8.	*a.* None. *b.* 2.4 to 5.2 vdc.
2	Set Oscilloscope to measure less than 0.4 vdc.	Same as 1	*a.* Remove ground from TEST POINTS Connector J2. *b.* Using the Oscilloscope measure the voltage at Test Point Strip TPD-8.	*a.* None. *b.* Less than 0.4 vdc.

APPENDIX A

REFERENCES

Following is a list of references available to the user of the Test Set Navigational Set, TACAN TS-3134/ARN-103.

DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins and Lubrication Orders.
DA Pam 310-7	Military Publications: US Army Equipment Index of Modification Work Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used by the Army.
TB746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 11-6625-23595-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools) for Test Set, Navigational Set, TACAN TS-3134/ARN-103.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure of measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

d. Adjust. Maintain within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used to precision measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, module (component or assembly) in a manner to allow the proper functioning of an equipment-system.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, Or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g., DMWR) in pertinent technical &manuals. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Format

a. Group Number. Column 1 lists group numbers, the purpose of which is to snatch components, assemblies, subassemblies and modules with the next higher assembly.

b. Functional Group. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies and modules within the group for which maintenance is authorized.

c. Maintenance Functions. Column 3 lists the twelve maintenance functions defined in B-2 above.

Each maintenance function required for an item is specified by the symbol among those listed in d below which indicates the level responsible for the required maintenance. Under this symbol is listed an appropriate work measurement time value determined as indicated in e below.

d. Use of Symbols. The following symbols are used to prescribe work function responsibility :

C	Operator/crew
()	Organization
F	Direct support
II	General support
D	Depot

e. Work Measurement Time. The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. The skill levels used to obtain the measurement times approximate those found in typical TOE units. Active repair time is the average aggregate time required to restore an item (subassembly, assembly. component. module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time. fault isolation/ diagnostic time, and QA/QC time in addition to the time required to perform specific maintenance functions identified for the tasks authorized in the maintenance allocation chart. This time is expressed in man-hours and carried to one decimal place (tenths of hours).

f. Tools and Test Equipment. This column is used to specify, by code, those tools and test equipment required to perform the designated function.

g. Remarks. Self-explanatory.

B-4. Explanation of Format of Table I and Test Equipment Requirements

The columns in table I follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the maintenance allocation chart. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category, The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment require+ to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number of the specific too1 or test equipment.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	TS-3134/ARM-103 TEST SET, NAVIGATIONAL SET, TACAN	O 0.05												Knobs, connectors, lights, fuses, cables, etc.
			O 0.08										2	Press and hold TEST INITIATE, lamp test, BIT, and ID TONE check.
				O 0.05										Clean surfaces.
										H 1.66			5	By replacing circuit cards, control unit, power supply, ID-563C/U, cables, panel connectors, knobs, lamps, etc.
1	RACK, ELECTRICAL EQUIPMENT	H 0.05												
			H 0.30										1,2,3,4,5,7,8, 21	
									H 0.25				5	
										H 0.45			2,3,4,5,7,8	By replacing circuit cards, power supply, control unit, ID-663C/U, coupler.
1A1	CIRCUIT CARD ASSEMBLY, TEST SEQUENCE CONTROL		D 1.00										2,3,4,5,7,8,9	
									H 0.25				5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A2	CIRCUIT CARD ASSEMBLY FAULT PRECEDENT LOGIC		D 1.00										2,3,4,5,7,8,9	
									H 0.25				5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A3	CIRCUIT CARD ASSEMBLY AGC PROCESSOR		D 1.00										2,3,4,5,7,8,9	
									H 0.25				5	
										D 3.00			3,4,7,8,9	By replacing piece parts

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) RE' RKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A4	CIRCUIT CARD ASSEMBLY, PROCESSOR NO. 2		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A5	CIRCUIT CARD ASSEMBLY, PROCESSOR NO. 1		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A6	CIRCUIT CARD ASSEMBLY, RANGE AND BEARING ZERO CHECK		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A7	CIRCUIT CARD ASSEMBLY, DISPLAY CONTROL		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 2.50			3,4,7,8,9	By replacing piece parts
1A8	CIRCUIT CARD ASSEMBLY, MULTIPLEXER		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 3.00			3,4,7,8,9	By replacing piece parts
1A9	CIRCUIT CARD ASSEMBLY, DISPLAY DRIVE NO. 1		D 1.00						H 0.25				2,3,4,5,7,8,9 5	
										D 2.50			3,4,7,8,9	By replacing piece parts

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1A10	CIRCUIT CARD ASSEMBLY, DISPLAY DRIVE, NO.2		D 1.00										2,3,4,5,7,8,9	
									H 0.25				5	
										D 2.50			3,4,7,8,9	By replacing piece parts
1A11	CONTROL, NAVIGATIONAL SET	O 0.02												Front panel
			H 0.50										2,3,4,7	As part of the TS-3134/ARN-103
									H 0.05				5	
										D 3.00			2,3,4,7,10	By replacing piece parts
1A11 A1	SERIAL DATA GENERATOR								D 0.30				5	
			D 1.50										3,4,10	As part of 1A11
										D 2.50			3,4,10	By replacing piece parts
1A11 A2	+5 VDC DRIVER								D 0.30				5	
			D 1.50										3,4,10	As part of 1A11
									D 2.50				3,4,10	By replacing piece parts
	SWITCHES AND FILTER		D 0.50										3	
									D 0.50				5	
1A12	CHASSIS ASSEMBLY, ELECTRICAL EQUIPMENT	H 0.30												Visual
			H 1.00										2,3,7,8	As part of the TS-3134/ARN-103
										D 3.00			3,5,6,13 thru 20	Replace piece parts and wiring

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1PS1	POWER SUPPLY		A 0.30										3,4,5,10,11,13	As part of the TS-3134/ARN-103
									H 0.25				5	
										D 4.00			3,4,5,10,11,12, 13	By replacing piece parts
1PS1 A1	CIRCUIT CARD ASSEMBLY, REGULATOR AND DELAY		D 1.00										3,4,5,11,12	As part of 1PS1
									D 0.10				5	
										D 2.50			3,4,5,11,12	By replacing piece parts
1PS1 A2	CIRCUIT CARD ASSEMBLY, SELF TEST, POWER SUPPLY		D 1.00										3,4,5,11,12	As part of 1PS1
									D 0.10				5	
										D 2.50			3,4,5,11,12	By replacing piece parts
1PS1 A3	CAPACITOR-DIODE ASSEMBLY		D 1.00										3,4,5,11	As par of 1PS1
									D 0.10				5	
										D 2.00			3,4,5,11	By replacing piece parts
	POWER SUPPLY ASSEMBLY		D 1.00										3,4,5,11,12	
									D 0.10				5	
										D 2.00			3,4,5,11,12	
T1FL1	COUPLER, DUAL LOW PASS FILTER								H 0.20				5	
1DS 16	ID-663C/U INDICATOR		H 0.20											By comparison with digital lamp outputs
									H 0.20				5	

MAINTENANCE ALLOCATION CHART

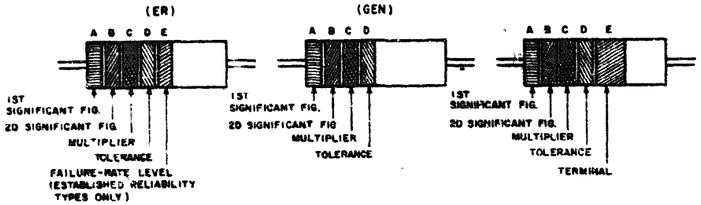
(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
										D 5.00				
2	ADAPTER, CONNECTOR ASSEMBLY	O 0.10												Visually inspect connector
			H 0.50										3	Continuity check
									H 0.10				5	
										D 1.00			3,5	By replacing piece parts, wiring, and connectors
MP3	CASE, COMBINATION	O 0.10		O 0.10										Inspect and clean
									H 0.30					
										D 1.00				By replacing parts
W-1	CABLE ASSEMBLY, RF ANTENNA	O 0.10												Connectors
			H 0.10										3	Continuity checks
									H 0.10					
										D 0.50			3,5	Replace parts and wires
W-2	CABLE ASSEMBLY, RF (SPO)	O 0.10												Connectors
			H 0.10										3	Continuity checks
									H 0.10					
										H 0.50			3,5	Replace parts and wires
W-3	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (TACAN AGE)	O 0.10												Connectors
			H 0.10										3	Continuity checks

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
W-4	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (COMPUTER SIGNAL)	O 0.10	H 0.10						H 0.10	D 0.50			3,5	Replace parts and wires
														Connectors
													3	Continuity checks
W-5	CABLE ASSEMBLY, BRANCHED, ELECTRICAL (TACAN POWER)	O 0.10	H 0.10						H 0.10	D 0.50			3,5	Replace parts and wires
														Connectors
													3	Continuity checks
W-6	CABLE ASSEMBLY, POWER	O 0.10	H 0.10						H 0.10	D 0.50			3,5	Replace parts and wires
														Connectors
													3	Continuity checks
									H 0.10	H 0.30			3,5	Replace parts and wires

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	H D	AN/USM-207A COUNTER, ELECTRONIC DIGITAL READOUT	6625-044-3228	
2	O H D	H-104/G HEADSET	5965-296-9910	
3	O H D	ME-26D/U MULTIMETER	6625-913-9781	
4	H D	AN/USM 281A OSCILLOSCOPE	6625-228-2201	
5	H D	TK-101G TOOL KIT, ELECTRONIC EQUIPMENT	5180-064-5178	
6	H D	CONNECTOR, ADAPTER, BNC TO CONHEX		
7	H	SG-321/U GENERATOR, SIGNAL	6625-674-7097	
8	H	Data Pulse 110B, PULSE GENERATOR	6625-113-6353	
9	D	TE-1633 TEST STATION, CARD		
10	D	TK-1487 TEST SET		
11	D	TE-1644 TEST STATION, POWER SUPPLY		
12	D	TE-1645 TEST SET		
13	D	MS-294-8 CRIMPING TOOL		
14	D	MS-3198-1 CRIMPING TOOL		
15	D	MS-3323-26 INSERTION TOOL		
16	D	MS-3323-22 INSERTION TOOL		
17	D	MS-3323-18 INSERTION TOOL		
18	D	MS-3324-26 REMOVAL TOOL		
19	D	MS-3324-22 REMOVAL TOOL		
20	D	MS-3324-18 REMOVAL TOOL		
21	H	AN/USM-207A COUNTER, ELECTRONIC, DIGITAL READOUT	6625-044-3228	



COLOR CODE MARKING FOR COMPOSITION TYPE RESISTORS

COLOR-CODE MARKING FOR FILM-TYPE RESISTORS.

TABLE I
COLOR CODE FOR COMPOSITION TYPE AND FILM TYPE RESISTORS.

BAND A		BAND B		BAND C		BAND D		BAND E		
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)	COLOR	FAILURE RATE LEVEL	TERM.
BLACK	0	BLACK	0	BLACK	1			BROWN	M=1.0	
BROWN	1	BROWN	1	BROWN	10			RED	P=0.1	
RED	2	RED	2	RED	100			ORANGE	R=0.01	
ORANGE..	3	ORANGE	3	ORANGE	1,000			YELLOW	S=0.001	
YELLOW	4	YELLOW	4	YELLOW	10,000	SILVER	±10 (COMP TYPE ONLY)	WHITE		SOLD-ERABLE
GREEN		GREEN	5	GREEN	100,000	GOLD	±5			
BLUE		BLUE	6	BLUE	1,000,000	RED	±2 (NOT APPLICABLE TO ESTABLISHED RELIABILITY)			
PURPLE (VIOLET)		URPLE (VIOLET)	7							
GRAY	8	GRAY	8	SILVER	0.01					
WHITE	9	WHITE	9	GOLD	0.1					

BAND A — THE FIRST SIGNIFICANT FIGURE OF THE RESISTANCE VALUE (BANDS A THRU D SHALL BE OF EQUAL WIDTH)

BAND B — THE SECOND SIGNIFICANT FIGURE OF THE RESISTANCE VALUE

BAND C — THE MULTIPLIER (THE MULTIPLIER IS THE FACTOR BY WHICH THE TWO SIGNIFICANT FIGURES ARE MULTIPLIED TO YIELD THE NOMINAL RESISTANCE VALUE.)

BAND D — THE RESISTANCE TOLERANCE

BAND E — WHEN USED ON COMPOSITION RESISTORS, BAND E INDICATES ESTABLISHED RELIABILITY FAILURE-RATE LEVEL (PERCENT FAILURE PER 1,000 HOURS) ON FILM RESISTORS, THIS BAND SHALL BE APPROXIMATELY 1-1/2 TIMES THE WIDTH OF OTHER BANDS, AND INDICATES TYPE OF TERMINAL

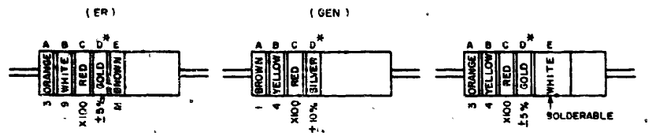
RESISTANCES IDENTIFIED BY NUMBERS AND LETTERS (THESE ARE NOT COLOR CODED)

SOME RESISTORS ARE IDENTIFIED BY THREE OR FOUR DIGIT ALPHA NUMERIC DESIGNATORS THE LETTER R IS USED IN PLACE OF A DECIMAL POINT WHEN FRACTIONAL VALUES OF AN OHM ARE EXPRESSED FOR EXAMPLE

2R7 = 2.7 OHMS 10R0 = 10.0 OHMS

FOR WIRE-WOUND-TYPE RESISTORS COLOR CODING IS NOT USED, IDENTIFICATION MARKING IS SPECIFIED IN EACH OF THE APPLICABLE SPECIFICATIONS

EXAMPLES OF COLOR CODING



NOMINAL RESISTANCE 3,900 OHMS
RESISTANCE TOLERANCE ±5%
FAILURE RATE LEVEL M

NOMINAL RESISTANCE 1,400 OHMS
RESISTANCE TOLERANCE ±10%

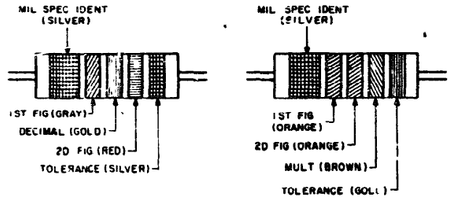
NOMINAL RESISTANCE 3,400 OHMS
RESISTANCE TOLERANCE ±5%
TERMINAL SOLDERABLE

COMPOSITION-TYPE RESISTORS

FILM-TYPE RESISTORS

* IF BAND D IS OMITTED, THE RESISTOR TOLERANCE IS ±20% AND THE RESISTOR IS NOT MIL-STD

A COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS



(A) 82UH ±10%

(B) 330UH ±5%

COLOR CODING FOR TUBULAR ENCAPSULATED R.F CHOKES. AT A, AN EXAMPLE OF OF THE CODING FOR AN 82UH CHOKE IS GIVEN AT B, THE COLOR BANDS FOR A 330UH INDUCTOR ARE ILLUSTRATED

TABLE 2
COLOR CODING FOR TUBULAR ENCAPSULATED R.F CHOKES

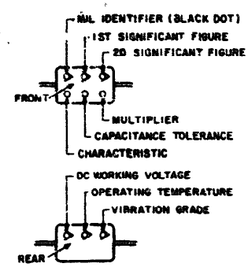
COLOR	SIGNIFICANT FIGURE	MULTIPLIER	INDUCTANCE TOLERANCE (PERCENT)
BLACK	0	1	
BROWN	1	10	1
RED	2	100	2
ORANGE	3	1,000	3
YELLOW	4		
GREEN	5		
BLUE	6		
VIOLET	7		
GRAY	8		
WHITE	9		
NONE			20
SILVER			10
GOLD	DECIMAL POINT		5

MULTIPLIER IS THE FACTOR BY WHICH THE TWO COLOR FIGURES ARE MULTIPLIED TO OBTAIN THE INDUCTANCE VALUE OF THE CHOKE COIL

B COLOR CODE MARKING FOR MILITARY STANDARD INDUCTORS.

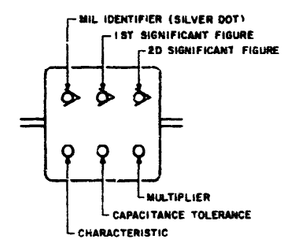
CAPACITORS, FIXED, VARIOUS-DIELECTRICS, STYLES CM, CN, CY, AND CB

CM



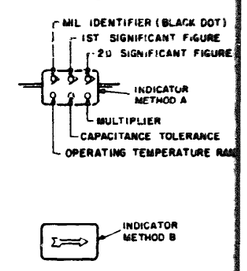
MICA-DIELECTRIC

CN

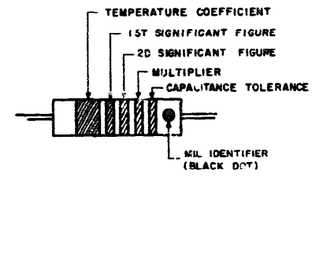


PAPER-DIELECTRIC

CY



GLASS-DIELECTRIC, GLASS CASE

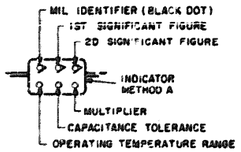


AXIAL LEAD

RADIAL LEAD

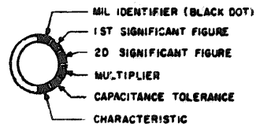
C COLOR COD

CY



GLASS-DIELECTRIC, GLASS CASE

CB



MICA, BUTTON TYPE

TABLE 3 — FOR USE WITH STYLES CM, CN, CY AND CB.

COLOR	MIL ID	1ST SIG FIG.	2D SIG FIG.	MULTIPLIER[1]	CAPACITANCE TOLERANCE				CHARACTERISTIC[2]			DC WORKING VOLTAGE	OPERATING TEMP RANGE	VIBRATION GRADE
					CM	CN	CY	CB	CM	CN	CB	CM	CC, CM	CM
BLACK	CM, CY, CB	0	0	1			±20%	±20%		A			-55°TO+70°C	10-55 HZ
BROWN		1	1	10					B	E	B			
RED		2	2	100	±2%		±2%	±2%	C				-55°TO+85°C	
ORANGE		3	3	1,000		±30%			D		D	300		
YELLOW		4	4	10,000					E				-55°TO+125°C	10-2,000 HZ
GREEN		5	5		±5%				F			500		
BLUE		6	6										-55°TO+150°C	
PURPLE (VIOLET)		7	7											
GRAY		8	8											
WHITE		9	9											
GOLD				0.1			±5%	±5%						
SILVER	CN			0.01	±10%	±10%	±10%	±10%						

TABLE 4 — TEMPERATURE COMPENSATING, STYLE CC.

COLOR	TEMPERATURE COEFFICIENT[4]	1ST SIG FIG.	2D SIG FIG.	MULTIPLIER[1]	CAPACITANCE TOLERANCE		MIL ID
					CAPACITANCES OVER 10 UUF	CAPACITANCES 10 UUF OR LESS	
BLACK	0	0	0	1		±2.0 UUF	CC
BROWN	-30	1	1	10	±1%		
RED	-80	2	2	100	±2%	±0.25 UUF	
ORANGE	-150	3	3	1,000			
YELLOW	-220	4	4				
GREEN	-330	5	5		±5%	±0.5 UUF	
BLUE	-470	6	6				
PURPLE (VIOLET)	-750	7	7				
GRAY		8	8	0.01*			
WHITE		9	9	0.1*	±10%		
GOLD	+100			0.1		±1.0 UUF	
SILVER				0.01			

1 THE MULTIPLIER IS THE NUMBER BY WHICH THE TWO SIGNIFICANT (SIG) FIGURES ARE MULTIPLIED TO OBTAIN THE CAPACITANCE IN UUF.

2 LETTERS INDICATE THE CHARACTERISTICS DESIGNATED IN APPLICABLE SPECIFICATIONS MIL-C-5, MIL-C-250, MIL-C-11272B, AND MIL-C-10950C RESPECTIVELY.

3 LETTERS INDICATE THE TEMPERATURE RANGE AND VOLTAGE-TEMPERATURE LIMITS DESIGNATED IN MIL-C-11015D.

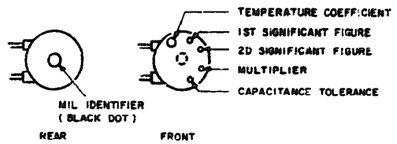
4 TEMPERATURE COEFFICIENT IN PARTS PER MILLION PER DEGREE CENTIGRADE.

* OPTIONAL CODING WHERE METALLIC PIGMENTS ARE UNDESIRABLE.

ATURE COEFFICIENT
SIGNIFICANT FIGURE
D SIGNIFICANT FIGURE
MULTIPLIER
CAPACITANCE TOLERANCE

MIL IDENTIFIER (BLACK DOT)

RADIAL LEAD



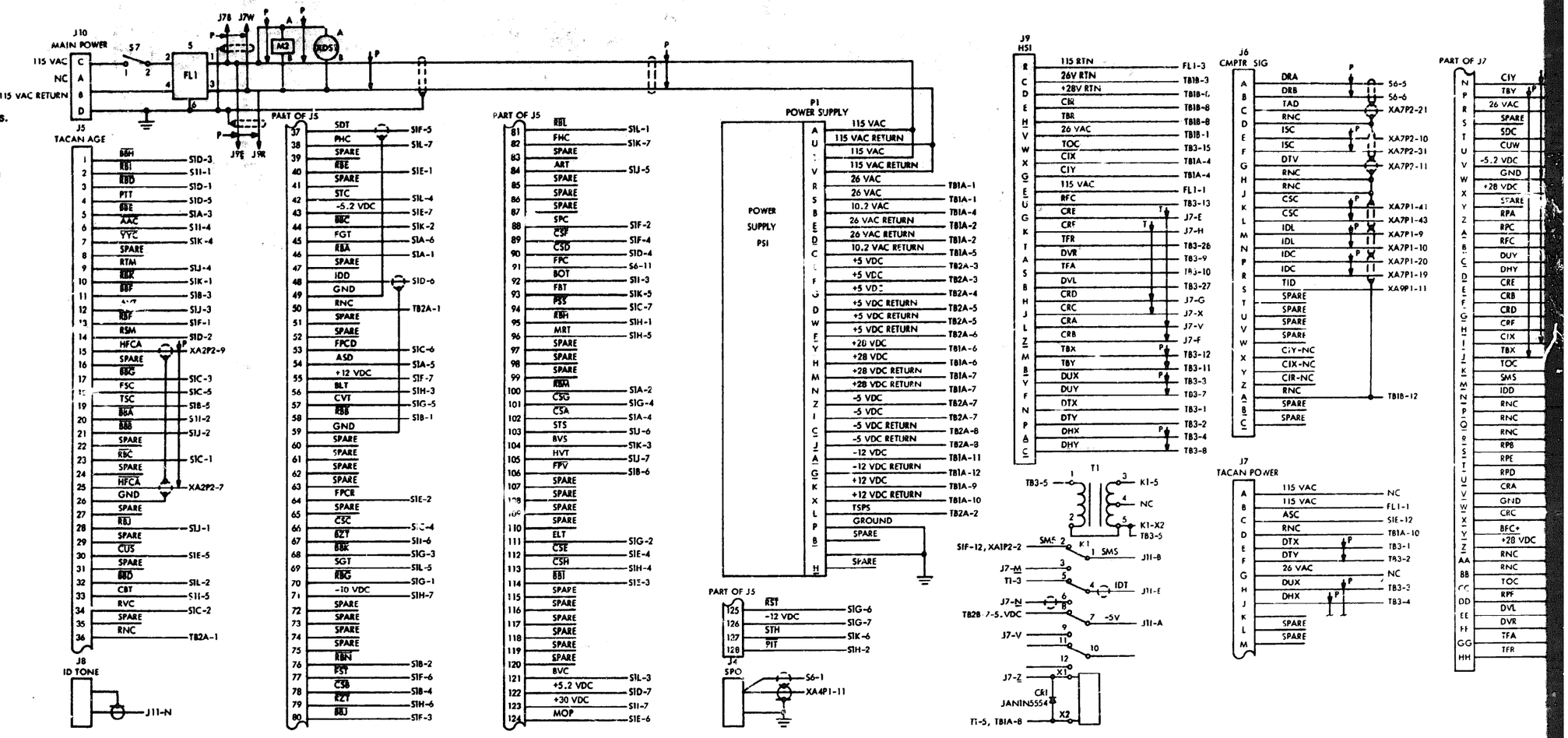
DISK-TYPE

C. COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS.

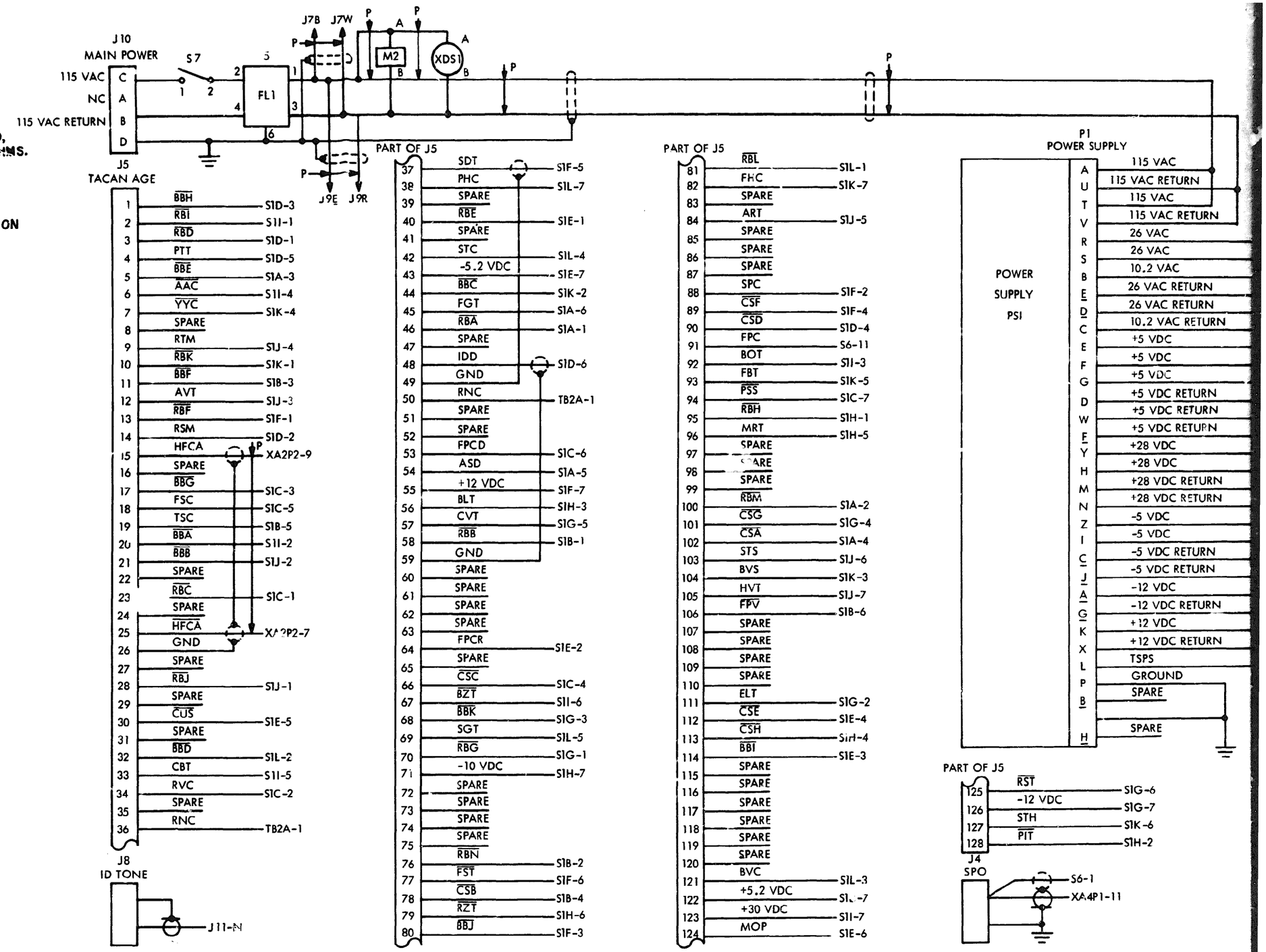
ESC-FM 913 73

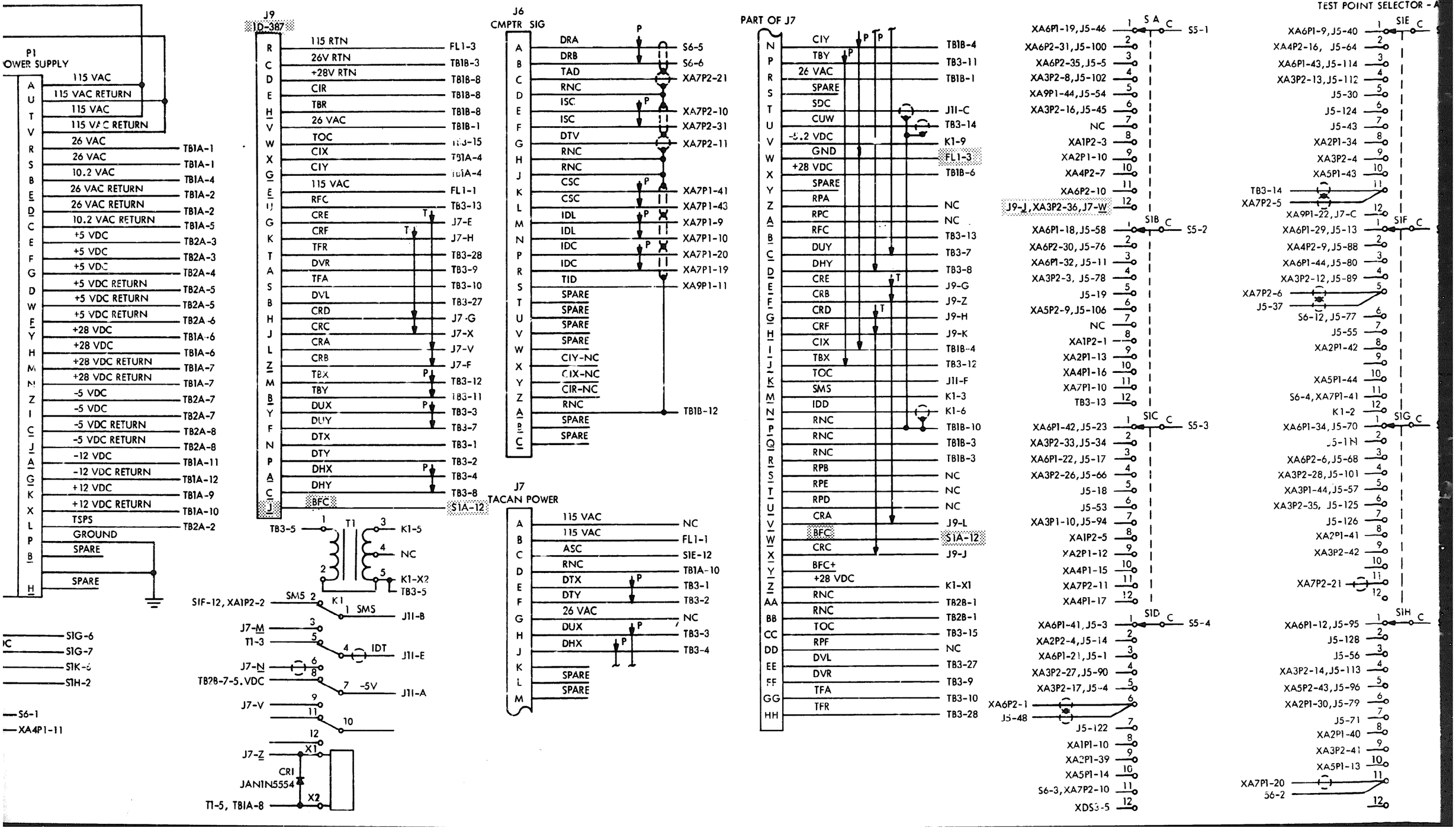
Figure FO-1 MIL-STD resistors, Inductors, capacitors color code markings.

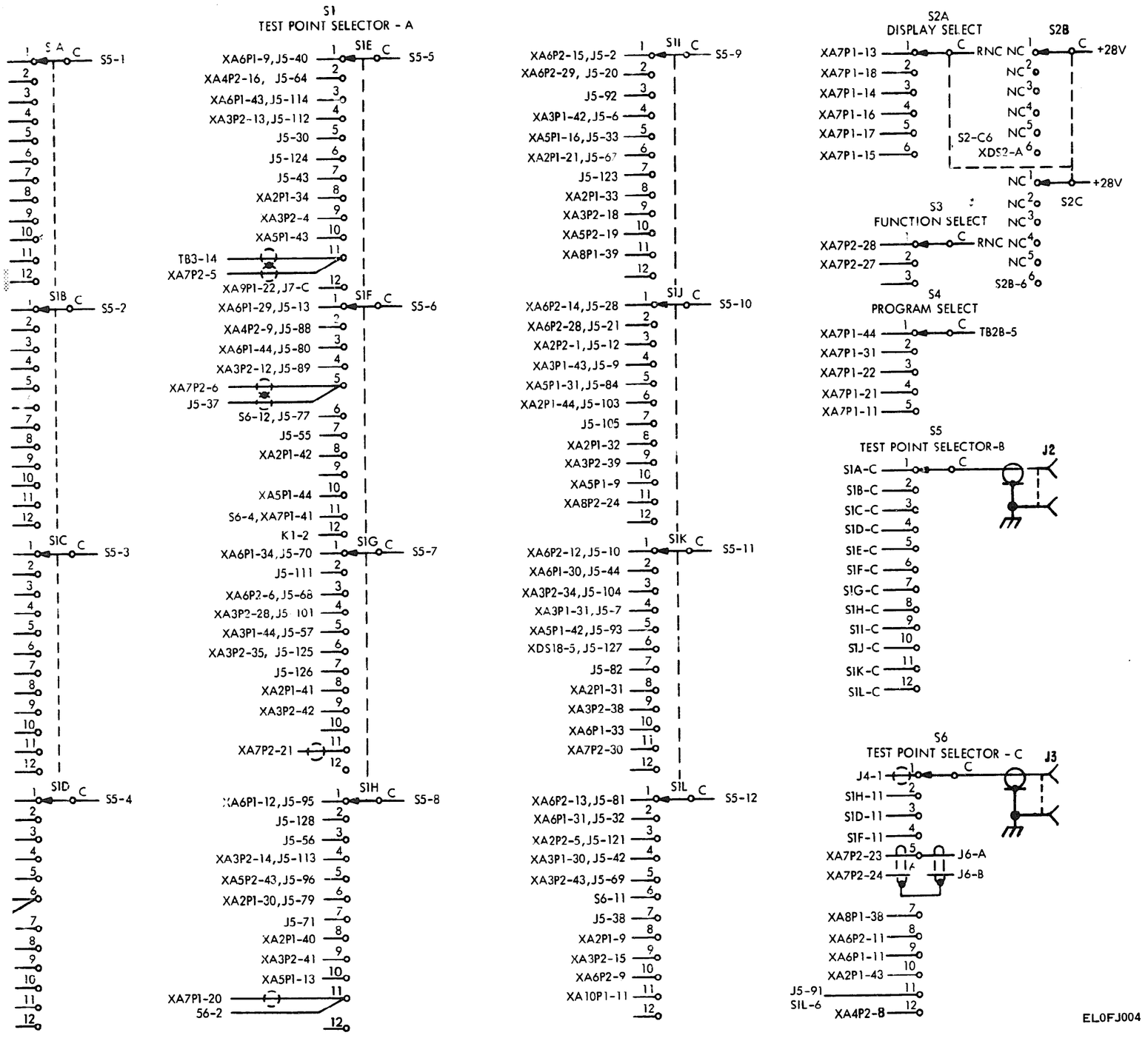
NOTE:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS.
2. LOWER CASE LETTERS ARE SHOWN AS UPPER CASE AND UNDERLINED FOR CLARITY.
3. PREFIX REFERENCE DESIGNATION WITH 1.



NOTE:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS.
2. LOWER CASE LETTERS ARE SHOWN AS UPPER CASE AND UNDERLINED FOR CLARITY.
3. PREFIX REFERENCE DESIGNATION WITH 1.




P1
POWER SUPPLY
AUTVRSBEDCEFGDWFYHMNZICJAGKXLPBH
115 VAC
115 VAC RETURN
115 VAC
115 VAC RETURN
26 VAC TB1A-1
26 VAC TB1A-1
10.2 VAC TB1A-4
26 VAC RETURN TB1A-2
26 VAC RETURN TB1A-2
10.2 VAC RETURN TB1A-5
+5 VDC TB2A-3
+5 VDC TB2A-3
+5 VDC TB2A-4
+5 VDC RETURN TB2A-5
+5 VDC RETURN TB2A-5
+5 VDC RETURN TB2A-6
+28 VDC TB1A-6
+28 VDC TB1A-6
+28 VDC RETURN TB1A-7
+28 VDC RETURN TB1A-7
-5 VDC TB2A-7
-5 VDC TB2A-7
-5 VDC RETURN TB2A-8
-5 VDC RETURN TB2A-8
-12 VDC TB1A-11
-12 VDC RETURN TB1A-12
+12 VDC TB1A-9
+12 VDC RETURN TB1A-10
TSPS TB2A-2
GROUND
SPARE
SPARE
S1G-6
S1G-7
S1K-6
S1H-2
S6-1
XA4P1-11
J9
ID-387
RCEDJGKTASBHJLZMBYFNPACJ
115 RTN FL1-3
26V RTN TB1B-3
+28V RTN TB1B-8
CIR TB1B-8
TBR TB1B-8
26 VAC TB1B-1
TOC TB3-15
CIX TB1A-4
CIY TB1A-4
115 VAC FL1-1
RFC TB3-13
CRE J7-E
CRF J7-H
TFR TB3-28
DVR TB3-9
TFA TB3-10
DVL TB3-27
CRD J7-G
CRC J7-X
CRA J7-V
CRB J7-F
TBX TB3-12
TBY TB3-11
DUX TB3-3
DUY TB3-7
DTX TB3-1
DTY TB3-2
DHX TB3-4
DHY TB3-8
BFC S1A-12
TB3-5
T1
K1-5
NC
K1-X2
TB3-5
SIF-12, XA1P2-2
SM5
K1
SMS
J11-B
J7-M
T1-3
IDT
J11-E
J7-N
TB28-7-5.VDC
-5V
J11-A
J7-V
J7-Z
X1
CR1
JAN1N5554
X2
T1-5, TB1A-8
J6
CMPTR SIG
ABCDEFGHJKLMNPRSTUVWXYZAaCc
DRA S6-5
DRB S6-6
TAD XA7P2-21
RNC
ISC XA7P2-10
ISC XA7P2-31
DTV XA7P2-11
RNC
RNC
CSC XA7P1-41
CSC XA7P1-43
IDL XA7P1-9
IDL XA7P1-10
IDC XA7P1-20
IDC XA7P1-19
TID XA9P1-11
SPARE
SPARE
SPARE
SPARE
CIY-NC
CIX-NC
CIR-NC
RNC TB1B-12
SPARE
SPARE
J7
TACAN POWER
ABCDEFGHJKLM
115 VAC NC
115 VAC FL1-1
ASC SIE-12
RNC TB1A-10
DTX TB3-1
DTY TB3-2
26 VAC NC
DUX TB3-3
DHX TB3-4
SPARE
SPARE
PART OF J7
NPRSTUVWXYZAABBCCDDEEFFGGHH
CIY TB1B-4
TBY TB3-11
26 VAC TB1B-1
SPARE
SDC J11-C
CUW TB3-14
-5.2 VDC K1-9
GND FL1-3
+28 VDC TB1B-6
SPARE
RPA NC
RPC NC
RFC TB3-13
DUY TB3-7
DHY TB3-8
CRE J9-G
CRB J9-Z
CRD J9-H
CRF J9-K
CIX TB1B-4
TBX TB3-12
TOC J11-F
SMS K1-3
IDD K1-6
RNC TB1B-10
RNC TB1B-3
RNC TB1B-3
RPB NC
RPE NC
RPD NC
CRA J9-L
BFC S1A-12
CRC J9-J
BFC+
+28 VDC K1-X1
RNC TB2B-1
RNC TB2B-1
TOC TB3-15
RPF NC
DVL TB3-27
DVR TB3-9
TFA TB3-10
TFR TB3-28
XA6P1-19, J5-46 1 S A C S5-1
XA6P2-31, J5-100 2
XA6P2-35, J5-5 3
XA3P2-8, J5-102 4
XA9P1-44, J5-54 5
XA3P2-16, J5-45 6
NC 7
XA1P2-3 8
XA2P1-10 9
XA4P2-7 10
XA6P2-10 11
J9-J, XA3P2-36, J7-W 12
XA6P1-18, J5-58 1 S1B C S5-2
XA6P2-30, J5-76 2
XA6P1-32, J5-11 3
XA3P2-3, J5-78 4
J5-19 5
XA5P2-9, J5-106 6
NC 7
XA1P2-1 8
XA2P1-13 9
XA4P1-16 10
XA7P1-10 11
TB3-13 12
XA6P1-42, J5-23 1 S1C C S5-3
XA3P2-33, J5-34 2
XA6P1-22, J5-17 3
XA3P2-26, J5-66 4
J5-18 5
J5-53 6
XA3P1-10, J5-94 7
XA1P2-5 8
XA2P1-12 9
XA4P1-15 10
XA7P2-11 11
XA4P1-17 12
XA6P1-41, J5-3 1 S1D C S5-4
XA2P2-4, J5-14 2
XA6P1-21, J5-1 3
XA3P2-27, J5-90 4
XA3P2-17, J5-4 5
XA6P2-1 J5-48 6
J5-122 7
XA1P1-10 8
XA2P1-39 9
XA5P1-14 10
S6-3, XA7P2-10 11
XDS3-5 12
S1
TEST POINT SELECTOR - A
XA6P1-9, J5-40 1 S1E C
XA4P2-16, J5-64 2
XA6P1-43, J5-114 3
XA3P2-13, J5-112 4
J5-30 5
J5-124 6
J5-43 7
XA2P1-34 8
XA3P2-4 9
XA5P1-43 10
TB3-14 XA7P2-5 11
XA9P1-22, J7-C 12
XA6P1-29, J5-13 1 S1F C
XA4P2-9, J5-88 2
XA6P1-44, J5-80 3
XA3P2-12, J5-89 4
XA7P2-6 J5-37 5
S6-12, J5-77 6
J5-55 7
XA2P1-42 8
9
XA5P1-44 10
S6-4, XA7P1-41 11
K1-2 12
XA6P1-34, J5-70 1 S1G C
J5-114 2
XA6P2-6, J5-68 3
XA3P2-28, J5-101 4
XA3P1-44, J5-57 5
XA3P2-35, J5-125 6
J5-126 7
XA2P1-41 8
XA3P2-42 9
10
XA7P2-21 11
12
XA6P1-12, J5-95 1 S1H C
J5-128 2
J5-56 3
XA3P2-14, J5-113 4
XA5P2-43, J5-96 5
XA2P1-30, J5-79 6
J5-71 7
XA2P1-40 8
XA3P2-41 9
XA5P1-13 10
XA7P1-20 11
S6-2 12


S1
TEST POINT SELECTOR - A
S1A C S5-1
S1B C S5-2
S1C C S5-3
S1D C S5-4
S1E C S5-5
XA6P1-9,J5-40
XA4P2-16, J5-64
XA6P1-43,J5-114
XA3P2-13,J5-112
J5-30
J5-124
J5-43
XA2P1-34
XA3P2-4
XA5P1-43
TB3-14
XA7P2-5
XA9P1-22,J7-C
S1F C S5-6
XA6P1-29,J5-13
XA4P2-9,J5-88
XA6P1-44,J5-80
XA3P2-12,J5-89
XA7P2-6
J5-37
S6-12,J5-77
J5-55
XA2P1-42
XA5P1-44
S6-4,XA7P1-41
K1-2
S1G C S5-7
XA6P1-34,J5-70
J5-111
XA6P2-6,J5-68
XA3P2-28,J5-101
XA3P1-44,J5-57
XA3P2-35, J5-125
J5-126
XA2P1-41
XA3P2-42
XA7P2-21
S1H C S5-8
XA6P1-12,J5-95
J5-128
J5-56
XA3P2-14,J5-113
XA5P2-43,J5-96
XA2P1-30,J5-79
J5-71
XA2P1-40
XA3P2-41
XA5P1-13
XA7P1-20
56-2
S1I C S5-9
XA6P2-15,J5-2
XA6P2-29, J5-20
J5-92
XA3P1-42,J5-6
XA5P1-16,J5-33
XA2P1-21,J5-67
J5-123
XA2P1-33
XA3P2-18
XA5P2-19
XA8P1-39
S1J C S5-10
XA6P2-14,J5-28
XA6P2-28,J5-21
XA2P2-1,J5-12
XA3P1-43,J5-9
XA5P1-31,J5-84
XA2P1-44,J5-103
J5-105
XA2P1-32
XA3P2-39
XA5P1-9
XA8P2-24
S1K C S5-11
XA6P2-12,J5-10
XA6P1-30,J5-44
XA3P2-34,J5-104
XA3P1-31,J5-7
XA5P1-42,J5-93
XDS18-5,J5-127
J5-82
XA2P1-31
XA3P2-38
XA6P1-33
XA7P2-30
S1L C S5-12
XA6P2-13,J5-81
XA6P1-31,J5-32
XA2P2-5,J5-121
XA3P1-30,J5-42
XA3P2-43,J5-69
S6-11
J5-38
XA2P1-9
XA3P2-15
XA6P2-9
XA10P1-11
S2A
DISPLAY SELECT
S2B
XA7P1-13
XA7P1-18
XA7P1-14
XA7P1-16
XA7P1-17
XA7P1-15
RNC
NC
S2-C6
XDS2-A
+28V
S2C
S3
FUNCTION SELECT
XA7P2-28
XA7P2-27
S2B-6
S4
PROGRAM SELECT
XA7P1-44
XA7P1-31
XA7P1-22
XA7P1-21
XA7P1-11
TB2B-5
S5
TEST POINT SELECTOR-B
J2
S1A-C
S1B-C
S1C-C
S1D-C
S1E-C
S1F-C
S1G-C
S1H-C
S1I-C
S1J-C
S1K-C
S1L-C
S6
TEST POINT SELECTOR - C
J3
J4-1
S1H-11
S1D-11
S1F-11
XA7P2-23
XA7P2-24
J6-A
J6-B
XA8P1-38
XA6P2-11
XA6P1-11
XA2P1-43
J5-91
S1L-6
XA4P2-8
EL0FJ004

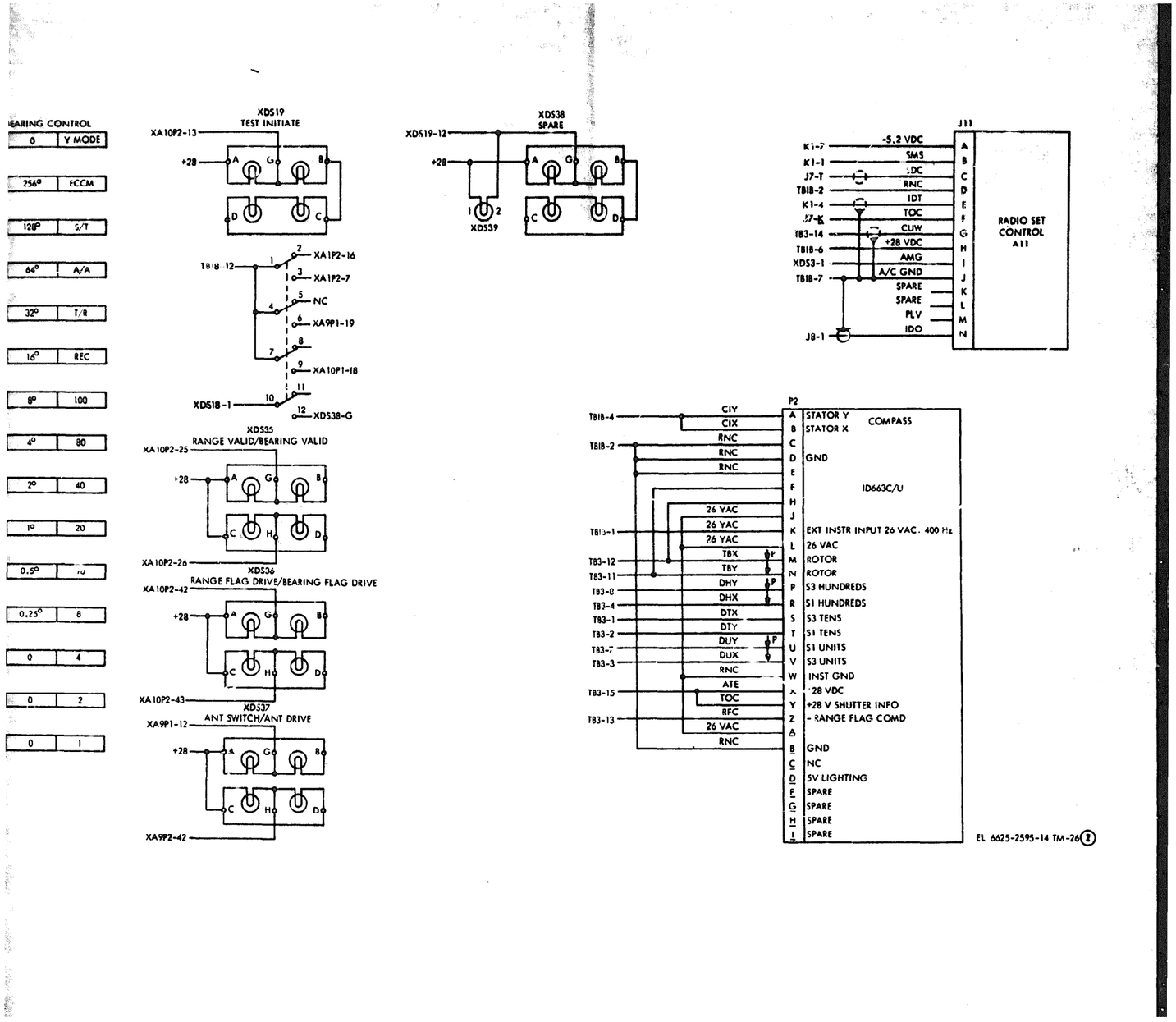
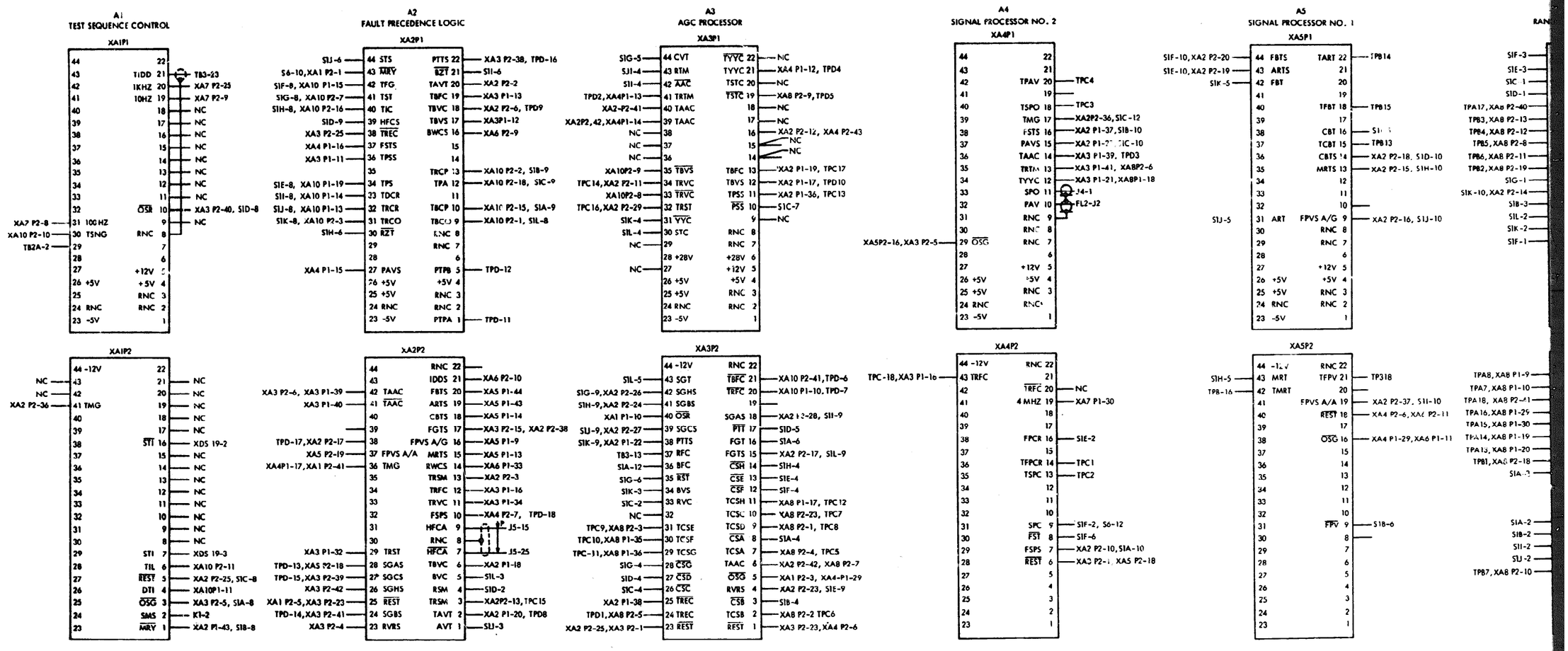


Figure FO-2 (2) .Test set interconnect wiring diagram.


A1
TEST SEQUENCE CONTROL
XA1P1
TIDD
IKHZ
10HZ
100 HZ
TSNG
+12V
+5V
RNC
-5V
TB3-23
XA7 P2-25
XA7 P2-9
XA3 P2-40, S1D-8
XA7 P2-8
XA10 P2-10
TB2A-2
XA1P2
-12V
TIL
DTI
SMS
K1-2
XA2 P1-43, S1B-8
XDS 19-2
XA10 P2-11
XA2 P2-25, S1C-8
XA10P1-11
XA3 P2-5, S1A-8
A2
FAULT PRECEDENCE LOGIC
XA2P1
STS
TFG
TST
TIC
HFCS
FSTS
TPSS
TRCP
TPS
TDCR
TRCR
TRCO
PAVS
PTTS
TAVT
TBFC
TBVC
TBVS
BWCS
PTPA
XA3 P2-38, TPD-16
S1I-6
XA2 P2-2
XA3 P1-13
XA2 P2-6, TPD9
XA3P1-12
XA6 P2-9
XA10 P2-2, S1B-9
XA10 P2-18, S1C-9
XA10 P2-15, S1A-9
XA10 P2-1, S1L-8
TPD-12
TPD-11
S6-10, XA1 P2-1
S1F-8, XA10 P1-15
S1G-8, XA10 P2-7
S1H-8, XA10 P2-16
S1D-9
XA3 P2-25
XA4 P1-16
XA3 P1-11
S1E-8, XA10 P1-19
S1I-8, XA10 P1-14
S1J-8, XA10 P1-13
S1K-8, XA10 P2-3
S1H-6
XA4 P1-15
XA2P2
RNC
IDDS
FBTS
ARTS
CBTS
FGTS
FPVS A/A
MRTS
RWCS
TRSM
TRFC
TRVC
FSPS
HFCA
HFCA
TBVC
BVC
RSM
TRSM
TAVT
AVT
XA6 P2-10
XA5 P1-44
XA5 P1-43
XA5 P1-14
XA3 P2-15, XA2 P2-38
XA5 P1-9
XA5 P1-13
XA6 P1-33
XA2 P2-3
XA3 P1-16
XA3 P1-34
XA4 P2-7, TPD-18
J5-15
J5-25
XA2 P1-18
S1L-3
S1D-2
XA2P2-13, TPC15
XA2 P1-20, TPD8
S1J-3
XA3 P2-6, XA3 P1-39
XA3 P1-40
TPD-17, XA2 P2-17
XA5 P2-19
XA4P1-17, XA1 P2-41
XA3 P1-32
TPD-13, XA5 P2-18
TPD-15, XA3 P2-39
XA3 P2-42
XA1 P2-5, XA3 P2-23
TPD-14, XA3 P2-41
XA3 P2-4
A3
AGC PROCESSOR
XA3P1
CVT
RTM
TRTM
TAAC
TBFC
TBVS
TPSS
TRST
STC
+28V
+5V
RNC
-5V
TYVC
TSTC
TBFC
TBVS
TPSS
PSS
NC
XA4 P1-12, TPD4
XA8 P2-9, TPD5
XA2 P2-12, XA4 P2-43
XA2 P1-19, TPC17
XA2 P1-17, TPD10
XA2 P1-36, TPC13
S1C-7
S1G-5
SJ1-4
S1I-4
TPD2, XA4P1-13
XA2-P2-41
XA2P2, 42, XA4P1-14
XA10P2-9
TPC14, XA2 P2-11
XA10P2-8
TPC16, XA2 P2-29
S1K-4
S1L-4
XA3P2
-12V
SGT
SGHS
SGBS
SGAS
SGCS
SGHS
SGBS
RVRS
IDDS
FBTS
ARTS
CBTS
FGTS
FPVS A/A
MRTS
RWCS
TRSM
TRFC
TRVC
FSPS
HFCA
HFCA
TBVC
BVC
RSM
TRSM
TAVT
AVT
TBFC
TRFC
CSH
CSE
CSF
TCSH
TCSC
TCSD
CSA
TCSA
TAAC
CSG
CSD
CSC
CSB
TCSB
REST
S1L-5
S1G-9, XA2 P2-26
S1H-9, XA2 P2-24
XA1 P1-10
S1J-9, XA2 P2-27
S1K-9, XA2 P1-22
T83-13
S1A-12
S1G-6
S1K-3
S1C-2
TPC9, XA8 P2-3
TPC10, XA8 P1-35
TPC-11, XA8 P1-36
S1G-4
S1D-4
S1C-4
XA2 P1-38
TPD1, XA8 P2-5
XA2 P2-25, XA3 P2-1
XA10 P2-41, TPD-6
XA10 P1-10, TPD-7
XA2 P2-28, S1I-9
S1D-5
S1A-6
XA2 P2-17, S1L-9
S1H-4
S1E-4
S1F-4
XA8 P1-17, TPC12
XA8 P2-23, TPC7
XA8 P2-1, TPC8
S1A-4
XA8 P2-4, TPC5
XA2 P2-42, XA8 P2-7
XA1 P2-3, XA4-P1-29
XA2 P2-23, S1E-9
S1B-4
XA8 P2-2 TPC6
XA3 P2-23, XA4 P2-6
A4
SIGNAL PROCESSOR NO. 2
XA4P1
TPAV
TSPO
TMG
FSTS
PAVS
TAAC
TRTM
TYYC
SPO
PAV
RNC
+12V
+5V
RNC
TPC4
TPC3
XA2P2-36, S1C-12
XA2 P1-37, S1B-10
XA2 P1-21, S1C-10
XA3 P1-39, TPD3
XA3 P1-41, XA8P2-6
XA3 P1-21, XA8P1-18
J4-1
FL2-J2
XA5P2-16, XA3 P2-5
XA4P2
-12V
TRFC
4 MHZ
FPCR
TSPC
SPC
FST
FSPS
REST
TPC-18, XA3 P1-16
NC
XA7 P1-30
S1E-2
TPC1
TPC2
S1F-2, S6-12
S1F-6
XA2 P2-10, S1A-10
XA2 P2-1, XA5 P2-18
A5
SIGNAL PROCESSOR NO. 1
XA5P1
FBTS
ARTS
FBT
TFBT
CBT
TCBT
CBTS
MRTS
ART
FPVS A/G
TART
TPB14
TPB15
TPB13
XA2 P2-18, S1D-10
XA2 P2-15, S1H-10
XA2 P2-16, S1J-10
S1F-10, XA2 P2-20
S1E-10, XA2 P2-19
S1K-5
S1J-5
XA5P2
-12V
MRT
TMRT
FPVS A/A
TFPV
FPV
REST
OSG
TP318
XA2 P2-37, S1I-10
XA4 P2-6, XA6 P2-11
XA4 P1-29, XA6 P1-11
S1B-6
S1H-5
TP8-16
RANGE
TPA8, XA8 P1-9
TPA7, XA8 P1-10
TPA18, XA8 P2-11
TPA16, XA8 P1-29
TPA15, XA8 P1-30
TPA14, XA8 P1-19
TPA13, XA8 P1-20
TPB1, XA8 P2-18
S1A-2
S1B-2
S1I-2
S1J-2
TPB7, XA8 P2-10
SIF-3
SIE-3
SIC-1
S1D-1
TPA17, XA8 P2-40
TPB3, XA8 P2-13
TPB4, XA8 P2-12
TPB5, XA8 P2-8
TPB6, XA8 P2-11
TPB2, XA8 P2-19
S1G-1
S1K-10, XA2 P2-14
S1B-3
S1L-2
S1K-2
S1F-1

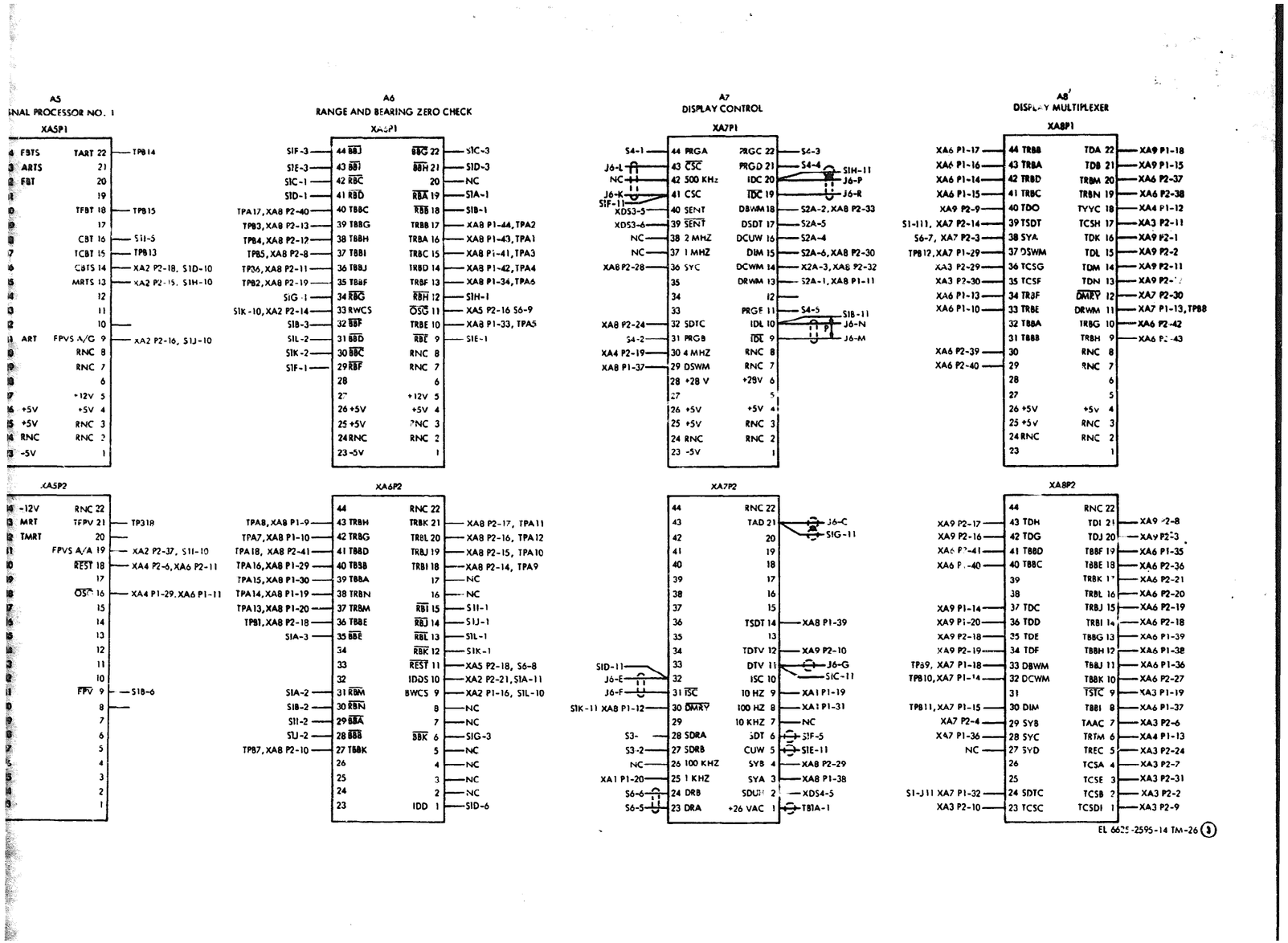


Figure FO-2 (3). Test set interconnect wiring diagram.

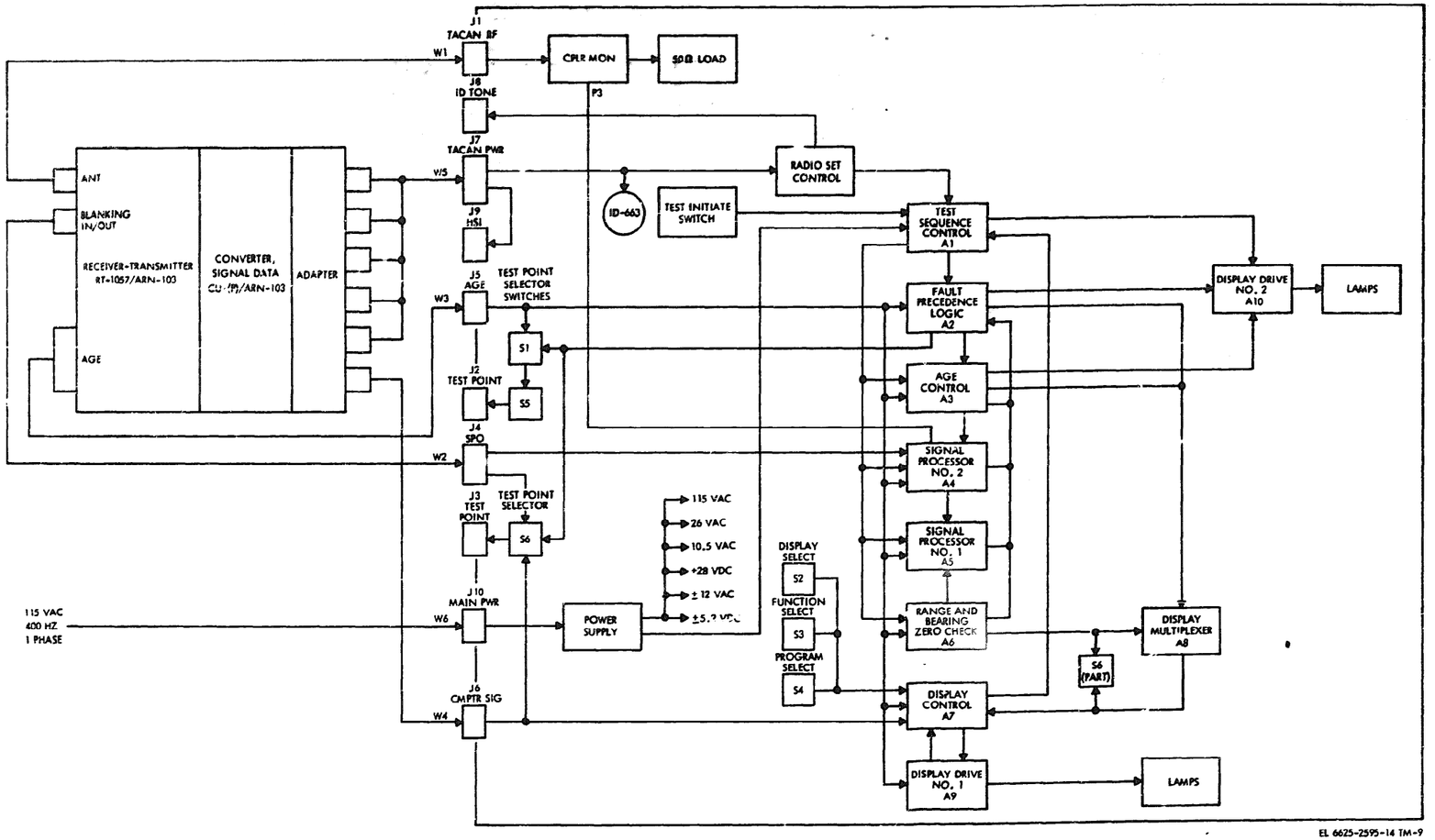


Figure FO-3 Test set block diagram.

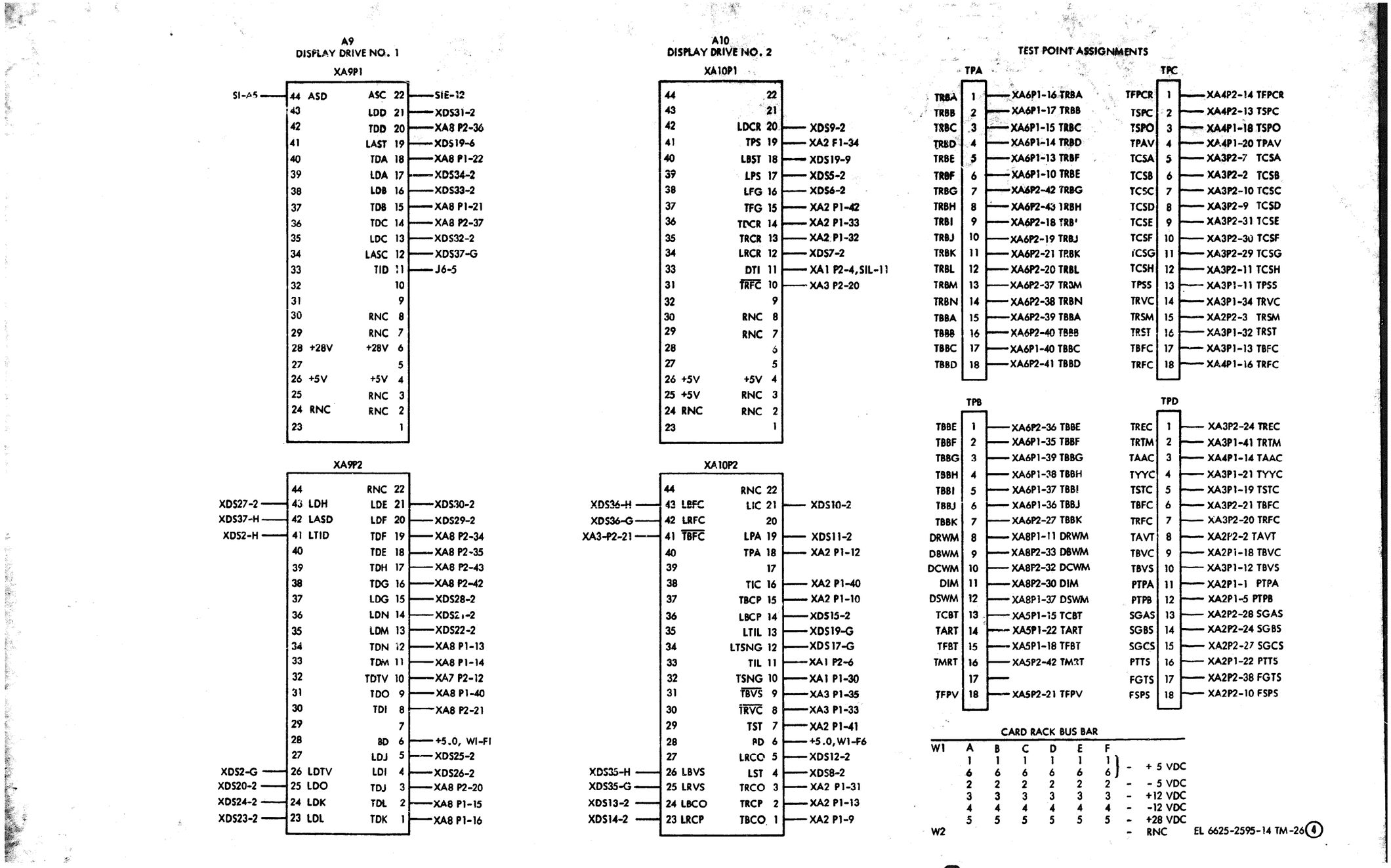


Figure FO-2 (4). Test set interconnect wiring diagram.

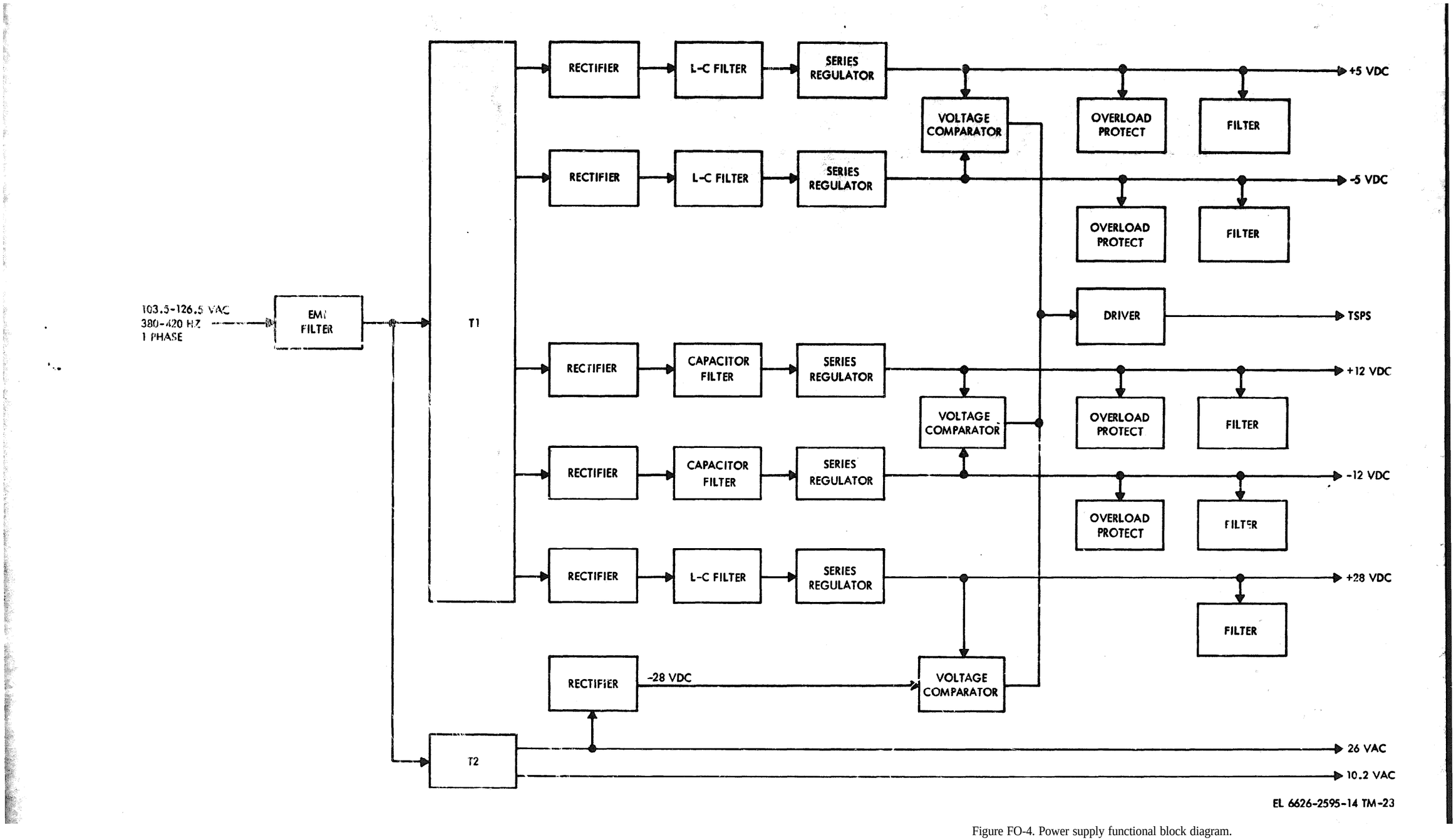


Figure FO-4. Power supply functional block diagram.

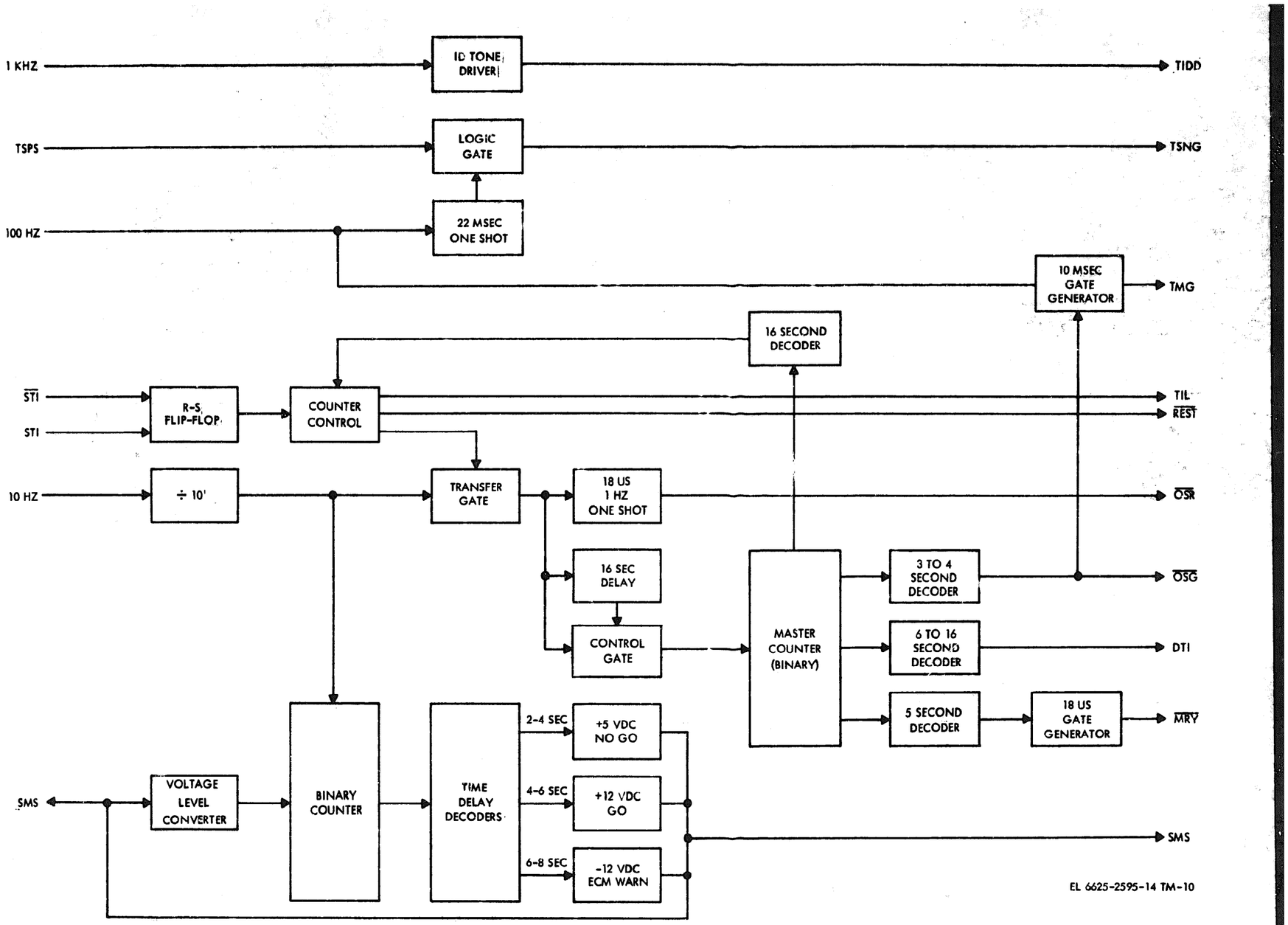


Figure FO-5. Test sequence control circuit card functional block diagram.

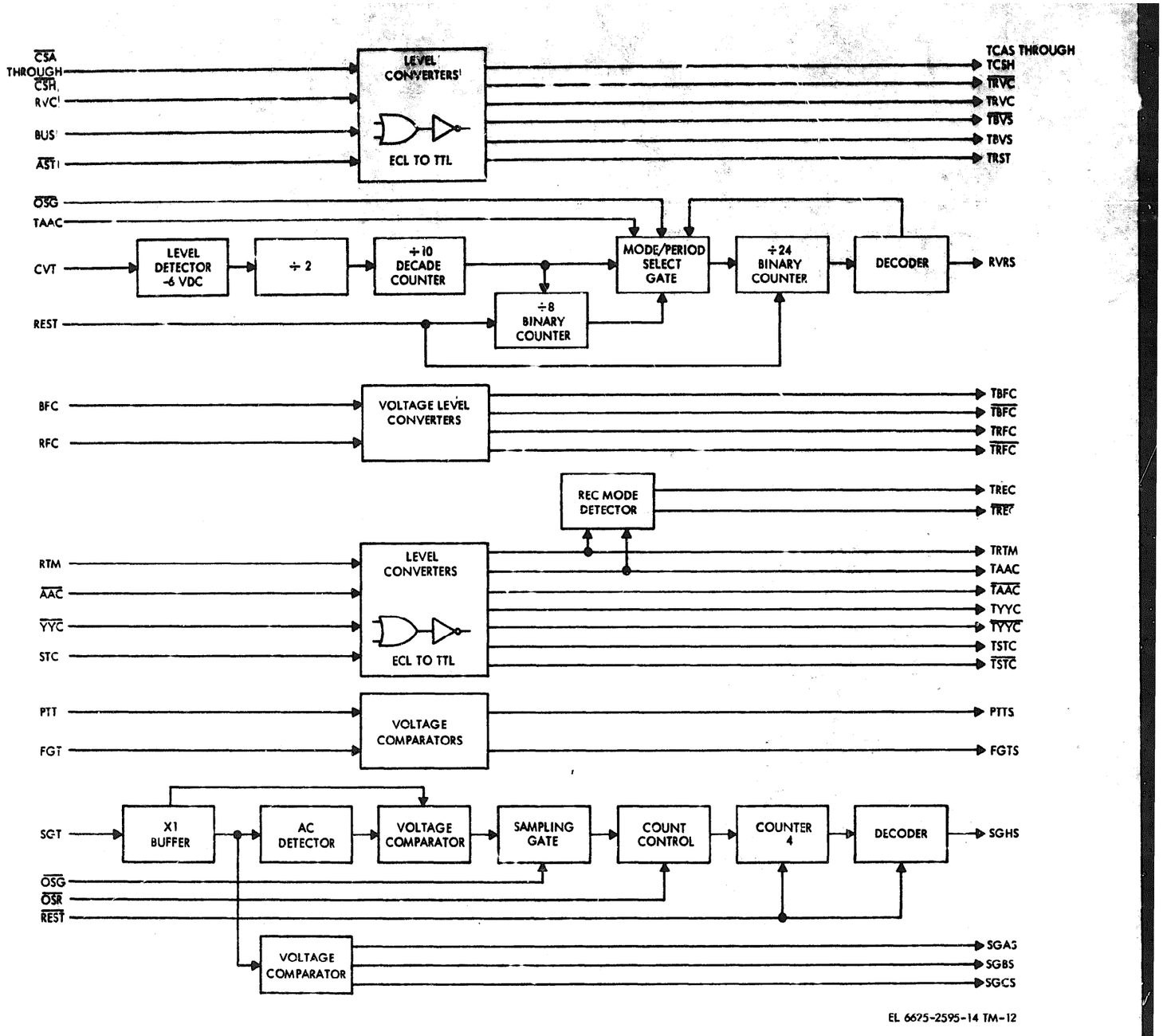


Figure FO-6. AGC processor circuit card functional block diagram.

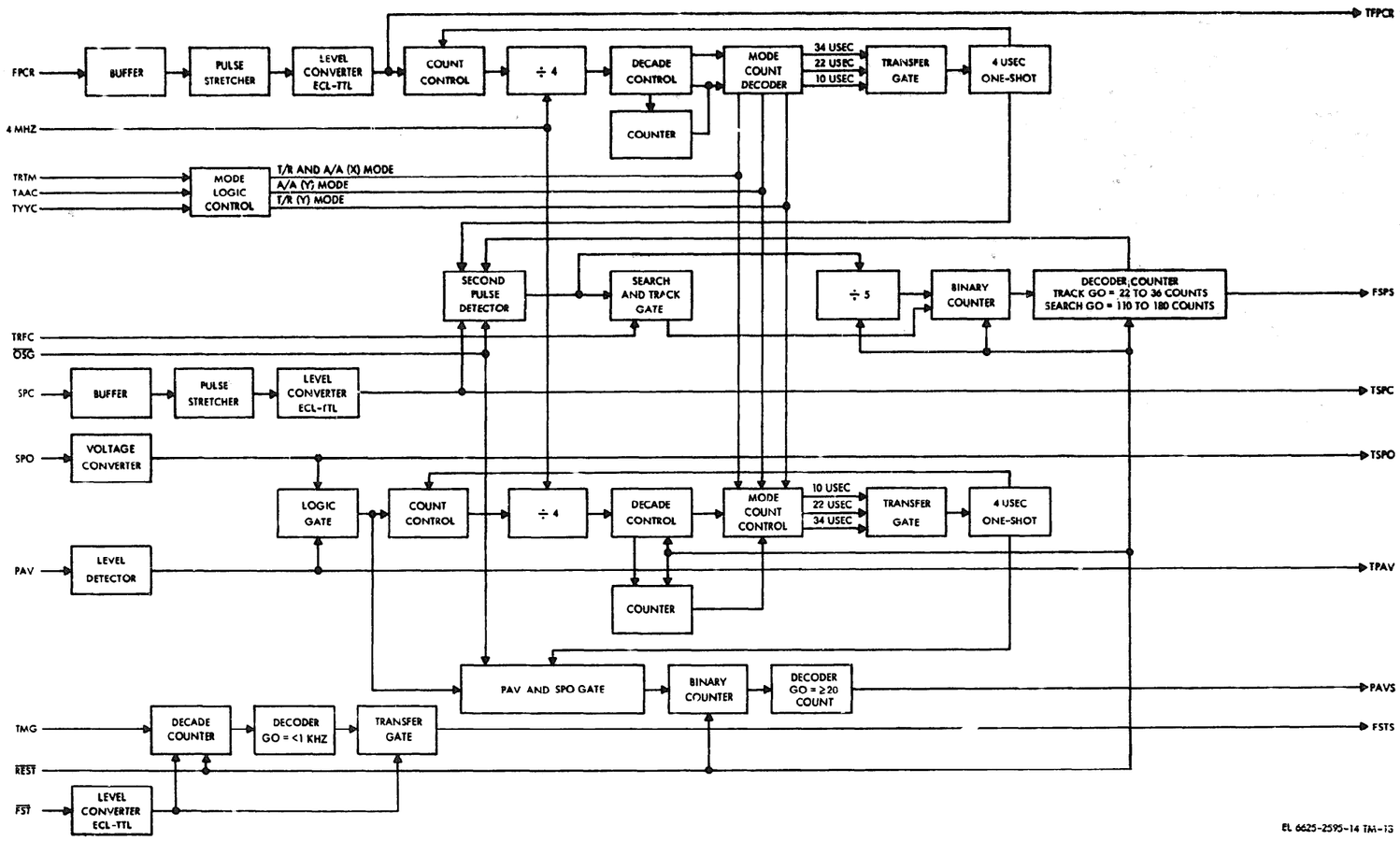


Figure FO-7 Single processor No. 2 circuit card functional block diagram.

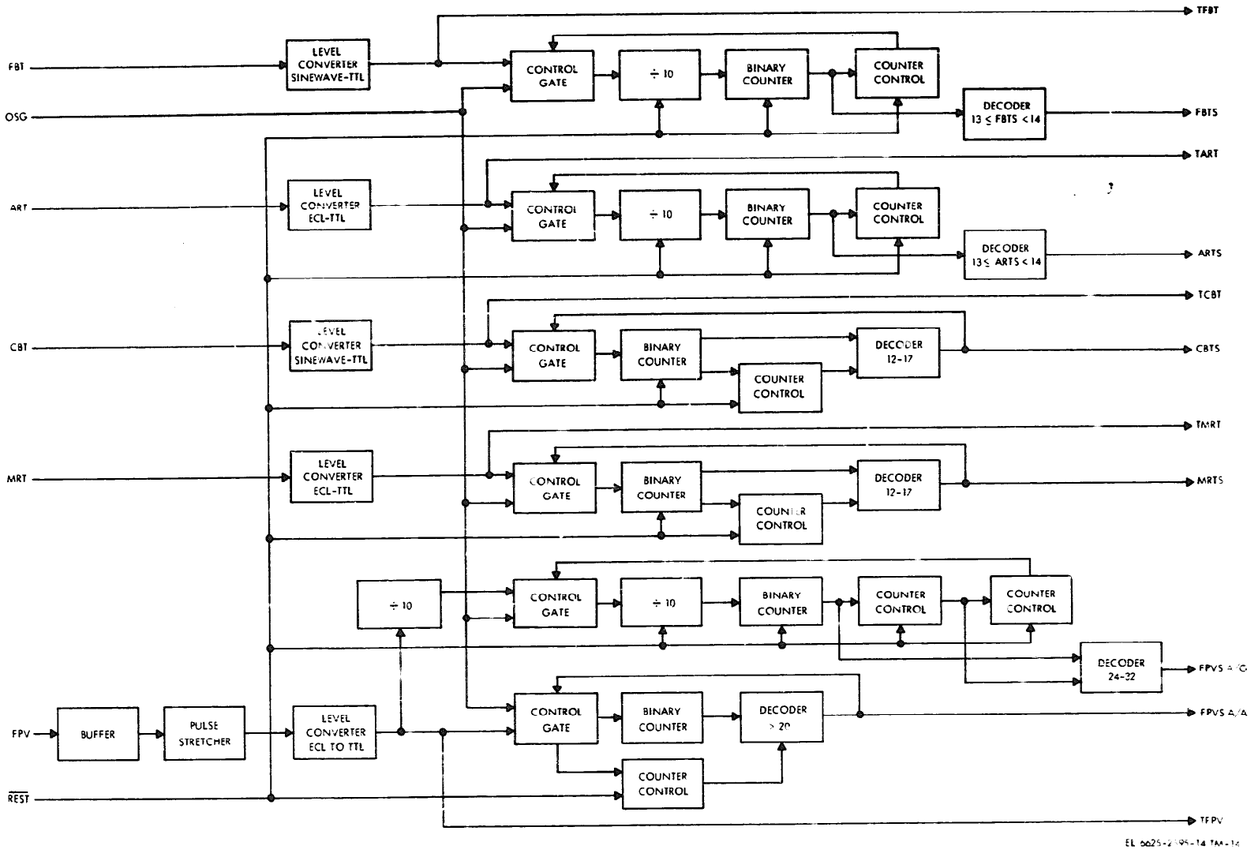


Figure FO-8. Signal processor No. 1 circuit card functional block diagram.

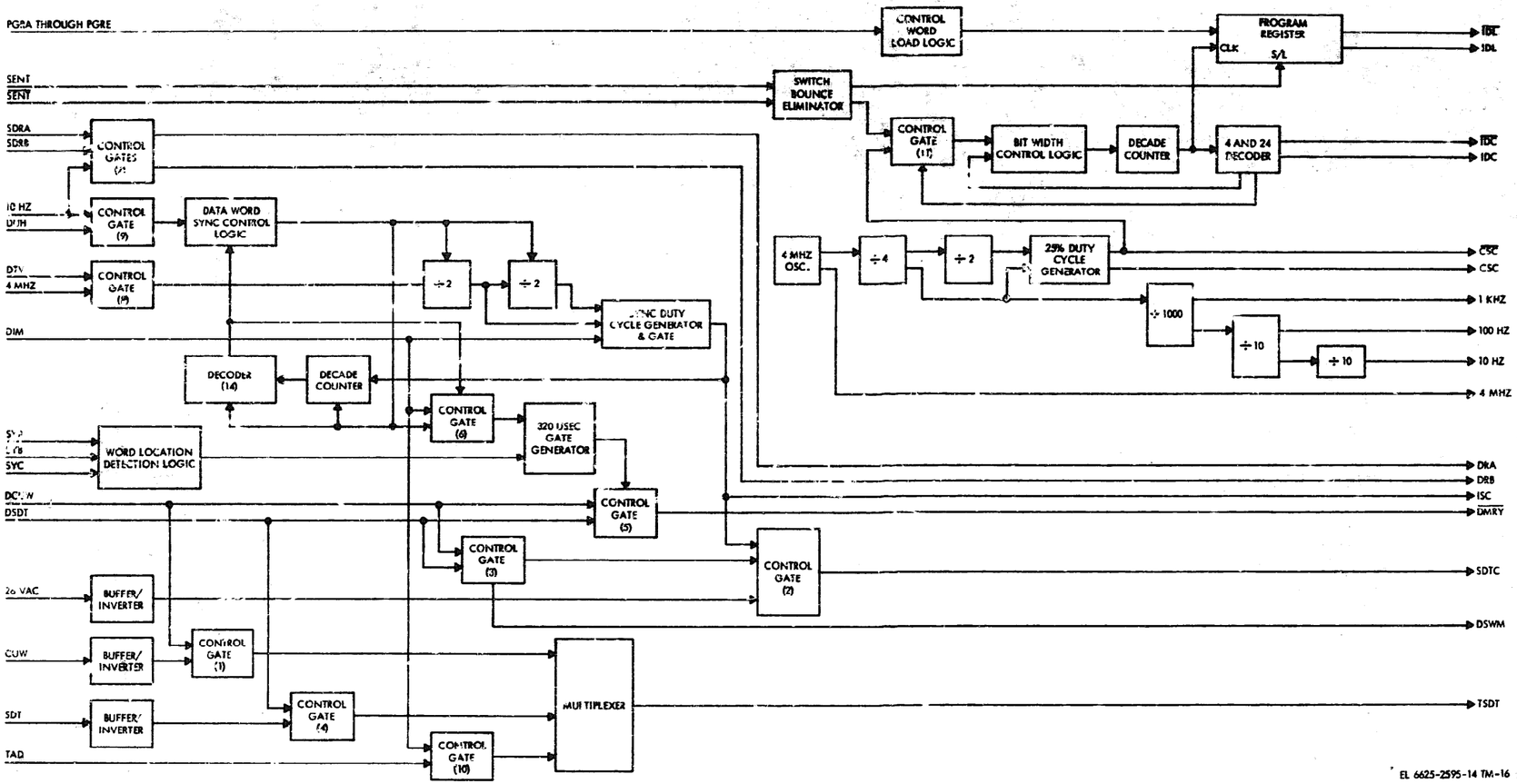


Figure FO-9. Display control circuit card functional block diagram.

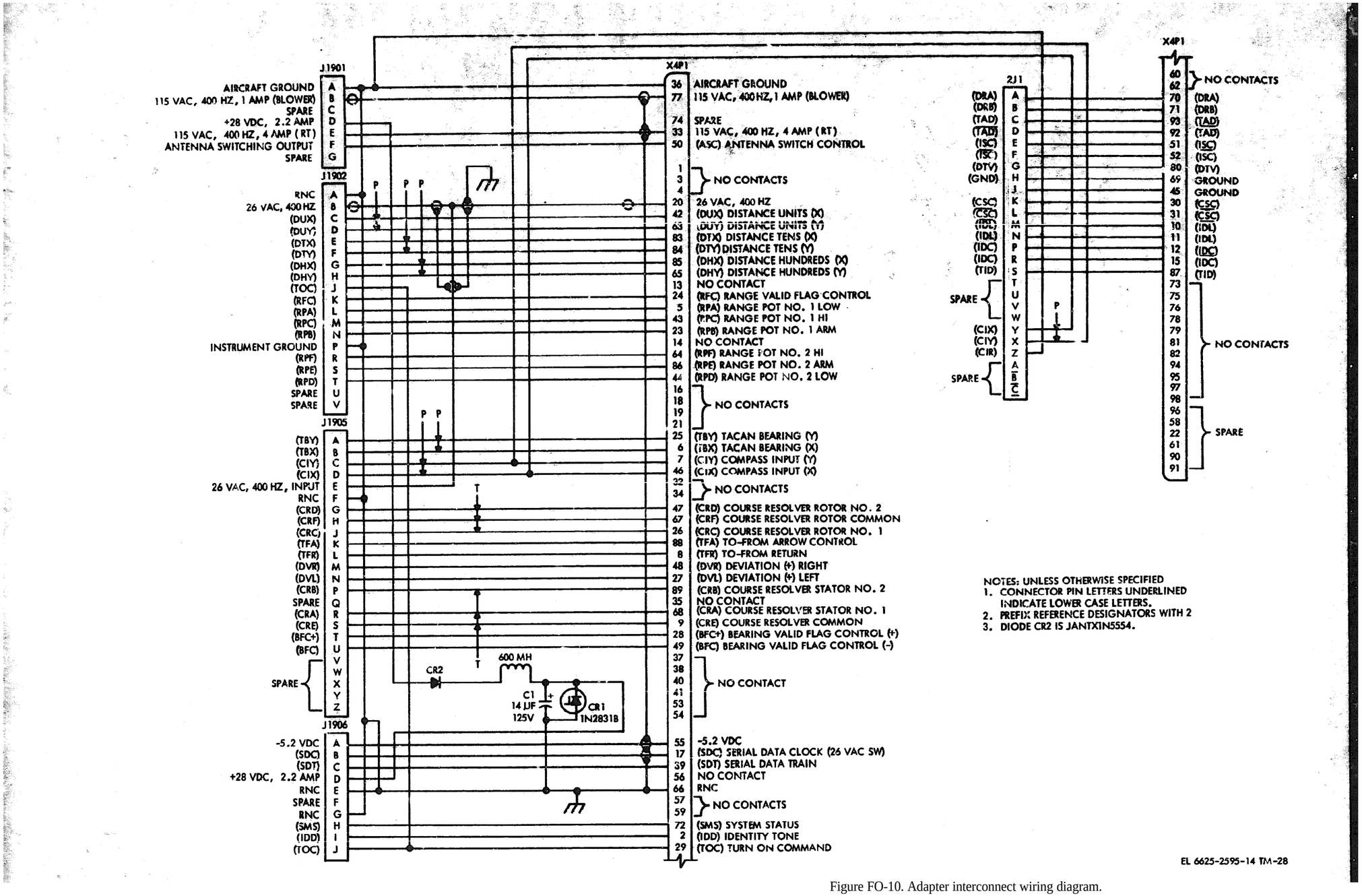


Figure FO-10. Adapter interconnect wiring diagram.

GLOSSARY

AAC	Air-to-air command MECL
ART	Auxiliary reference pulse test
ARTS	Auxiliary reference pulse test status
ASC	Antenna switch control
ASD	Antenna switch drive
AVT	Auxiliary bearing valid test
BBA	Bearing bit A
BBB	Bearing bit B
BBC	Bearing bit C
BBD	Bearing bit D
BBE	Bearing bit E
BBF	Bearing bit F
BBG	Bearing bit G
BBH	Bearing bit II
BBI	Bearing bit I
BBJ	Bearing bit J
BBK	Hearing bit K
BD	Lamp driver base bias
BFC	Bearing flag command
BVC	Bearing valid command
BVS	Bearing valid status
BVT	Bearing valid test
BWCS	Bearing word check status
CBT	Coarse hearing modulation test
CBTS	Coarse bearing modulation teat status
CSA	Channel select bit A
CSB	Channel select bit B
CSC	Channel select bit C
CSD	Channel select bit D
CSE	Channel select bit E
CSF	Channel select bit F
CSG	channel select bit G
CSH	Channel select bit H
CUV	Control unit word
CVT	Composite video output test
DBWM	Display bearing word mode
DCUW	Display control unit word
DCWM	Display control word mode
DIM	Display interface mode
DMRY	Display memory
DRA	Data request A
DRB	Data request B
DRWM	Display range word mode
DSLT	Display serial data train
DSWM	Display serial word mode
DTI	Display time interval
DTV	Data train valid
FBT	Fine bearing
FBTS	Fine bearing test status
FGT	Fast gain test
FGTS	Fast gain test status
FPC	First pulse command
FPCR	First pulse command range
FPV	First pulse valid complement
FPVSA/A	First pulse valid status-A / A
FPVSA/G	First pulse valid status-A / G
FST	Frequency generator status test
FSPS	First and second pulse status
FSTS	Frequency synthesizer test status
HFCA	High frequency clock A
IDC	Input data clock
IDD	Identity tone
IDDS	Identity tone status
IDL	Input data line
ISC	input shift clock
LASC	Lamp antenna switch command
LASD	Lamp antenna .-witch drive
LAST	Lamp drive a self test
LBCO	Lamp bearing computer
LBCP	Lamp bearing coupler
LBFC	Lamp bearing flag command
LBVS	Lamp bearing valid status
LDA	Lamp drive A
LDB	Lamp drive B
LDC	Lamp drive C
LDD	Lamp drive D
LDE	Lamp drive E
LDF	Lamp drive F
LDG	Lamp drive G
LDH	Lamp drive H
LDI	Lamp drive I
LDJ	Lamp drive J
LDK	Lamp drive K
LDL	Lamp drive L
LDM	Lamp drive M
LDN	Lamp drive N
LDO	Lamp drive O
LDCR	Lamp drive decoder
LDST	Lamp drive self test
LDTV	Lamp data tra' valid
LFG	Lamp frequency synthesizer
LIC	Lamp internal control
LPA	Lamp power amplifier
LPS	Lamp power supply
LRCO	Lamp range computer
LRCP	Lamp range coupler
LRCR	Lamp receiver
LRFC	Lamp range flag drive command
LRVS	Lamp range valid status
LST	Lamp self test
LRTID	Lamp auto
LTIL	Lamp test initiate
LTSNG	Lamp test set NO/GO
MRT	Main reference trigger
MRTS	Main reference trigger status
MRY	Memory
OSG	One second gate
OSR	One second reset
PAV	Power amplifier video
PAVS	Power amplifier video status
PSS	Power supply status
PRGA	Program A
PRGB	Program B
PRGC	Program C
PRGD	Program D
PRGE	Program E
PTT	Preselector tuning current test
PTTS	Preselecator tuning current test status
RBA	Range bit A
RBB	Range bit B

RBC	Range bit C
RBD	Range bit D
RBE	Range bit E
RBF	Range bit F
RBG	Range bit G
RBH	Range bit H
RRI	Range bit I
RBJ	Range bit J
RBK	Range bit K
RBL	Range bit L
RBM	Range bit M
RBN	Range bit N
REST	Reset
RFC	Range flag drive command
RNC	Ground
RSM	Range short memory
RST	Receiver status
RTM	Receiver-transmitter mode command
RVC	Range valid command
RVRS	Receiver video rate status
RWCS	Range word check status
SDRA	Switch data request A
SDRB	Switch data request B
SDT	Serial data train
SDTC	Serial data train clock
SDUH	Switch display update hold
SENT	Switch enter
SGAS	Slow gain A status
SGBS	Slow gain B status
SGCS	Slow gain C status
SGHS	Slow gain hunting status
SGT	Slow AGC test
SMS	System monitor status
SPC	Second pulse command
SPO	Suppression pulse output
STC	Self test command
STI	Self test initiate
SYA	Sync bit A
TAAC	Translated air-to-air command
TAD	TACAN data output line
TAVT	Translated auxiliary bearing valid test
TBBA	Translated bearing bit A
TBBB	Translated bearing bit B
TBBC	Translated bearing bit C
TBBD	Translated bearing bit D
TBBE	Translated bearing bit E
TBBF	Translated bearing bit F
TBBG	Translated bearing bit G
TBBH	Translated bearing bit H
TBBI	Translated bearing bit I
TBBJ	Translated bearing bit J
TBBK	Translated bearing bit K
TBCO	Tested bearing computer
TBCP	Tested bearing coupler
TBFC	Translated bearing flag command
TBVC	Translated bearing valid command
TBVS	Translated bearing valid status
TCSA-H	Translated channel select bits A through H
TDA	Translated data bit 1
TDB	Translated data bit 2
TDC	Translated data bit 3
TDD	Translated data bit 4
TDE	Translatea data bit 5
TDF	Translated data bit 6
TDG	Translated data bit 7
TDH	Translated data bit 8
TDI	Translated data bit 9
TDJ	Translated data bit 10
TDK	Translated data bit 11
TDL	Translated data bit 12
TDM	Translated data bit 13
TDN	Translated data bit 14
TDO	Translated data bit, 15
TDCR	Tested decoder
TDTV	Translated data train valid
TFG	Tested frequency synthesizer
TFPCR	Translated first pulse command range
TIC	Tested internal control
TID	Auto mode selected (T) Discrete)
TIDD	Tested set identity tone drive
TIL	Test initiate lamp
TMG	TO Msec gate
TPA	Tested power amplifier
TPAV	Translated power amplifier video
TPS	Tested power supply
TPSS	Translated power supply status
TRBA	Translated range bit A
TRBB	Translated range bit B
TRBC	Translated **range** bit C
TRBD	Translated range bit D
TRBE	Translated range bit E
TRBF	Translated range bit F
TRBG	Translated range big G
TRBH	Translated range bit H
TRBI	Translated range bit I
TRBJ	Translated range bit J
TRBK	Translated range bit K
TRBL	Translated range bit L
TRBM	Translated range bit M
TRBN	Translated range bit N
TRCO	Tested range computer
TRCP	Tested range coupler
TRCR	Tested receiver
TREC	Translated receive command
TRFC	Translated range flag command
TRSM	Translated range short memory
TRST	Translated receiver status
TRTM	Translated receiver-transmit command
TRVS	Translated range valid status
TSDT	Translated serial data train
TSNG	Test set NO / GO
TSPC	Translated second pulse command
TSPO	Translated suppression pulse out
TSPS	Test set power supply status
TST	Tested self test
TSTC	Translated self test command
TYYC	Translated Y mode command
YYC	Y mode command
IKHZ EXT	1 KHz TTL **clock**
IMHZ EXT	ı MHz TTL clock
2 MHZ EXT	2 MHz TTL clock

RBC	Range bit C
RBD	Range bit D
RBE	Range bit E
RBF	Range bit F
RBG	Range bit G
RBH	Range bit H
RBI	Range bit I
RBJ	Range bit J
RBK	Range bit K
RBL	Range bit L
RBM	Range bit M
RBN	Range bit N
REST	Reset
RFC	Range flag drive command
RNC	Ground
RSM	Range short memory
RST	Receiver status
RTM	Receiver-transmitter mode command
RVC	Range valid command
RVRS	Receiver video rate status
RWCS	Range word check status
SDRA	Switch data request A
SDRB	Switch data request B
SDT	Serial data train
SDTC	Serial data train clock
SDUH	Switch display update hold
SENT	Switch itch enter
SGAS	Slow gain A status
SGBS	Slow gain B status
SGCS	Slow gain C status
SGHS	Slow gain hunting status
SGT	Slow AGC test
SMS	System monitor status
SPC	Second pulse command
SPO	Suppression pulse output
STC	Self test command
STI	Self test initiate
SYA	Sync bit A
TAAC	Translated air-to-air command
TAD	TACAN data output line
TAVT	Translated auxiliary bearing valid test
TBBA	Translated bearing bit A
TBBB	Translated bearing bit B
TBBC	Translated bearing bit C
TBBD	Translated bearing bit D
TBBE	Translated bearing bit E
TBBF	Translated bearing bit F
TBBG	Translated bearing bit G
TBBH	Translated bearing bit H
TBBI	Translated bearing bit I
TBBJ	Translated bearing bit J
TBBK	Translated hearing bit K
TBCO	Tested bearing computer
TBCP	Tested bearing coupler
TBFC	Translated bearing flag command
TBVC	Translated bearing valid command
TBVS	Translated bearing valid status
TCSA-H	Translated channel select bits A through H
TDA	Translated data bit I
TDB	Translated data bit 2
TDC	Translated data bit 3
TDD	Translated data bit 4
TDE	Translatea data bit 5
TDF	Translated data bit 6
TDG	Translated data bit 7
TDH	Translated data bit 8
TDI	Translated data bit 9
TDJ	Translated data bit 10
TDK	Translated data bit 11
TDL	Translated data bit 12
TDM	Translated data bit 13
TDN	Translated data bit 14
TDO	Translated data bit, 15
TDCR	Tested decoder
TDTV	Translated data train valid
TFG	Tested frequency synthesizer
TFPCR	Translated first pulse command range
TIC	Tested internal control
TID	Auto mode selected (T1 Discrete)
TIDD	Tested set identity tone drive
TIL	Test initiate lamp
TMG	IO Msec gate
TPA	Tested power amplifier
TAPV	Translated power amplifier video
TPS	Tested power supply
TPSS	Translated power supply status
TRBA	Translated range bit A
TRBB	Translated range bit B
TRBC	Translated range bit C
TRBD	Translated range bit D
TRBE	Translated range bit E
TRBF	Translated range bit F
TRBG	Translated range big G
TRBH	Translated range bit H
TRBI	Translated range bit I
TRBJ	Translated range bit J
TRBK	Translated range bit K
TRBL	Translated range bit L
TRBM	Translated range bit M
TRBN	Translated range bit N
TRCO	Tested range computer
TRCP	Tested range coupler
TRCR	Tested receiver
TREC	Translated receive command
TRFC	Translated range flag command
TRSM	Translated range short memory
TRST	Translated receiver status
TRTM	Translated receiver-transmit command
TRVS	Translated range valid status
TSDT	Translated serial data train
TSNG	Test set NO/GO
TSPC	Translated second pulse command
TSPO	Translated suppression pulse out
TSPS	Test set power supply status
TST	Tested self test
TSTC	Translated self test command
TYYC	Translated Y mode command
YYC	Y mode command
1KHZ EXT	1 KHz TTL clock
1MHZ EXT	1 MHz TTL clock
2 MHZ EXT	2 MHZ TTL clock

INDEX

END

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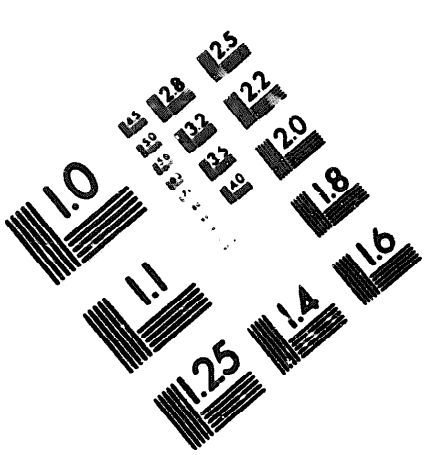
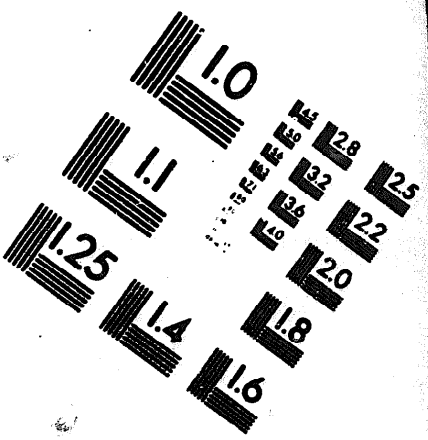
MICROFORM
TEST TARGET





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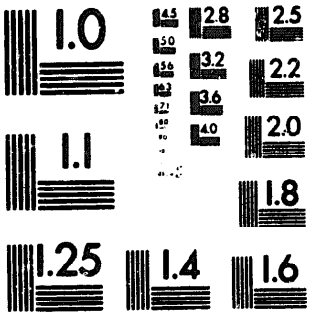

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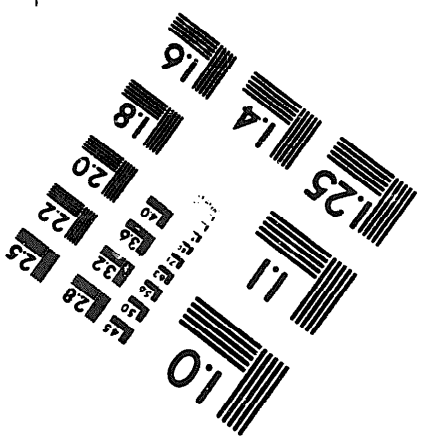

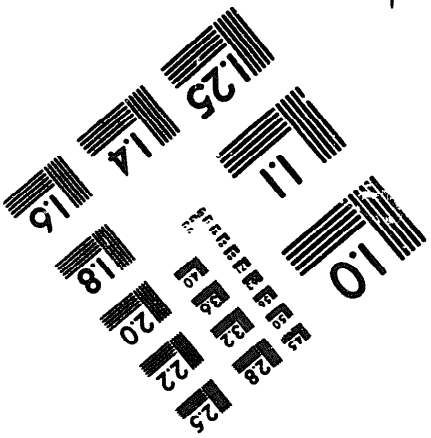

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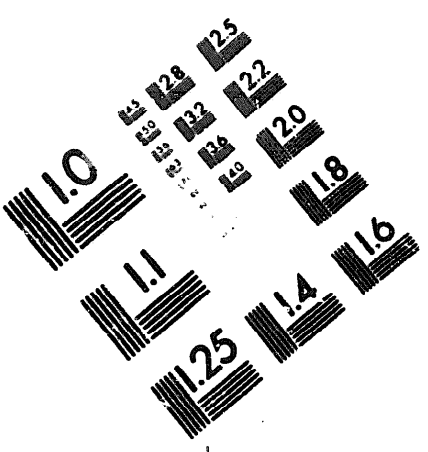

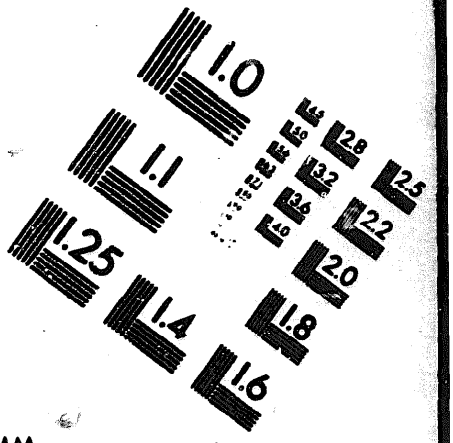

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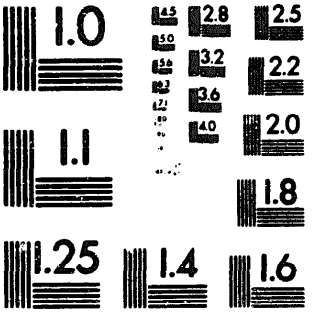

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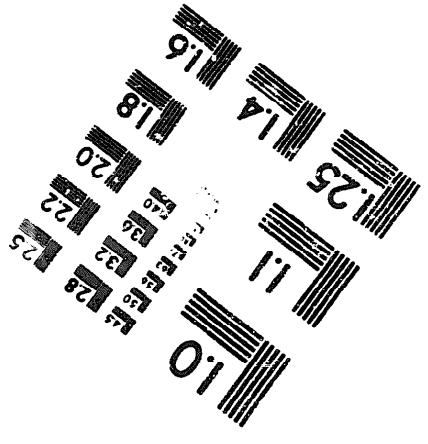

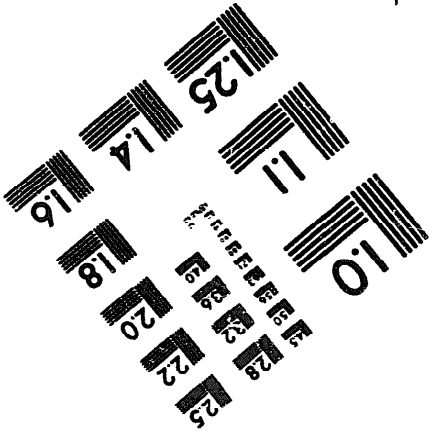

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