D E P A R T M E N T O F T H E A R M Y T E C H N I C A L M A N U A L

OPERATOR'S, ORGANIZATIONAL

FIELD AND DEPOT MAINTENANCE

TRAINER

RADAR AN/ULT-T2

This copy is a reprint which includes current pages from Changes 1 through 5.

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y

A P R I L 1 9 6 0

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D C., *19 April 1960*

TM 11-6940-205-15, (a reprint of Navy publication NAVEXOS P-1856, 1 July 1958) is published for the use of Army personnel.

By Order of Wilber M. Brucker, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

USASA (2)
Det Atomic Spt Agcy (5)
CNGB (1)
Tech Stf, DA (1) except CSigO (18)
Tech Stf Bd (1)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA AD Bd (1)
USA Abn & Elct. Bd (1)
USA Avn Bd (1)
USA ATB (1)
USCONARC (5)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5) except First US Army (7)
Corps (2)
Div (2)
Ft Belvoir (5)
USATC (2)
Svc Colleges (5)
Br Svc Sch (5) except USASCS (25)
Gen Dep (2) except Atlanta Gen Dep (None)
Sig Sec, Gen Dep (10)
Sig Dep (17)
Army Pictoral Cen (2)
Engr Maint Cen (1)
USA Ord Msl Comd (3)
USASSA (15)
USASSAMRO (1)
USA Sig Pub Agcy (8)
USA .Sig Engr Agcy (1)
USA Comm Agcy (3)
USA Sig Eqp Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
WRAMC (1)
AFIP (1)
AMS (1)
Ports of Emb (OS) (2)
Trans Terminal Comd (1)
Army Terminals (1)
OS Sup Agcy (1)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Lab (1)
Sig Fld Maint Shops (3)
USA Corps (Res) (1)
JBUSMC (2)
Units organized under following:
TOE's:
11-7 (2)
11-16 (2)
11-57 (2)
11-98 (2)
11-117 (2)
11-155 (2)
11-500 (AA-AE) (2)
11-557 (2)
11-557 (2)
11-592 (2)
11-597 (2)

NG: None.
USAR: None
For explanation of abbreviations used see AR 320-50.

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *11 June 1974*

Operator's, Organizational, Field and Depot Maintenance
TRAINER, RADAR AN/ULT-T2

TM 11-6940-205-15, 19 April 1960, is changed as follows:
Page 1. Delete paragraphs 1-2.1 and 1-2.2 and substitute:

1-2.1. Indexes of Publications

*a. DA Pam 310-4***.** Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-2.2. 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 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58/NAVSUP PUB 378/AFR 714/MCO P4030.29, 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/NAVSUPINST 4610.33/AFM 75-18/MCO P4610.19A, and DSAR 4500.15.

1-2.3. Reporting of Errors

Report 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: AMSEL-MA-C Fort Monmouth, NJ 07703.
Page 2. After paragraph 1-13, add the following:

1-13.1. Items Comprising an Operable Equipment

FSN	*QTY*	*Nomenclature, part .No., and mfr code*	*Fig. No.*
6940-856-8176		Transmitting Set, Countermeasures Training Signal AN/ULT-72 which includes:	
		NOTE **The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 70442 and is used to identify manufacturer, distributor, or Government agency, etc**	
6940-856-8177	1	Transmitter, Countermeasures Training Signal T483/UTL-T2: A0 and A9 emission, 8500 to 9600 mc freq range, 105 to 120 v, 48 to 62 cps or 390 to 450 cps, single ph, 92071, R-1448-2060	
6940-473-5284	1	Antenna AS-1057/ULT-72	
6150-160-5549	1	Cable Assembly, Power, Electrical CX-7784/U: 25 ft lg, 92071, R-1448-3/35	

FSN	*QTY*	*Nomenclature, part No., and mfr code*	*Fig No.*
5995-823-3096	1	Cable Assembly, Radio Frequency CG-92F/U: 7 ft 6 in lg. Sig dwg SC-D-23249	
5995-823-3095	1	Cable Assembly, Radio Frequency CG-L391/U: 12 in lg, 92071, R-1448-2131	
5965 504-6370	1	Headset, Electrical H-113/U	
6940-877-2944	1	Power Monitor: 92071, R-14483243	

1-13.2. Spare Parts

QTY	*Item*
1	Electron Tube: MIL type 0A2WA
1	Electron Tube: MIL type 5R4WGA
1	Electron Tube: MIL type 6AH6WA
6	Electron Tube: MIL type 6AU6WA
1	Electron Tube: MIL type 6D4
1	Electron Tube: MIL type 6L6WGB
2	Electron Tube: MIL type 6X4WA
2	Electron Tube: MIL type 12AT7WA
1	Electron Tube: MIL type 5651WA
2	Electron Tube: MIL type 5751WA
3	Electron Tube: MIL type 5814A
2	Electron Tube: MIL type 6080WA
2	Electron Tube: MIL type 6005/6AQ5W
4	Electron Tube: MIL type 6100/6C4WA
6	Fuse, Cartridge: MIL type F03G3R00B
1	Lamp, Glow: MIL type NE51
1	Lamp, Incandescent: MIL type MS-15571-2

Delete Appendix III and substitute:

APPENDIX III
BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Trainer, Radar AN/ULT-T2.

2. General

The Basic Issue Items List and Items Troop Installed or Authorized List are divided into the following sections:

a. Basic Issue Items List -Section II. A list in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or Authorized List -Section III. Not applicable.

3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

Section II. BASIC ISSUE ITEMS LIST

(1) ILLUSTRATION		(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4)
(A) FIG. NO.	(B) ITEM NO.		PART NUMBER & FSCM — USABLE ON CODE	QTY FURN WITH EQUIP
		6940-877-4868	CASE, RADAR SET CY-3543/ULT-T2	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

DISTRIBUTION:

Active Army:

CNGB (1)
TSG (1)
ACSC-E (2)
USAMB (10)
USASA (2)
USAARENBD (1)
TRADOC (2)
AMC (1)
MICOM (1)
TECOM (2)
ARADCOM (2)
ARADCOM Rgn (1)
OS Maj Comd (2)
USACC (2)
HISA Ft Monmouth (18)
Armies (1)
USASCS (10)
USASESS (5)
Svc Colleges (1)
Fort Huachuca (5)
WSMR (1)
Fort Carson (5)
USAERDAA (1)
USAERDAW (1)
Army Dep (1) except
LBAD (10)
SAAD (30)
TOAD (14)
ATAD (10)
USA Dep (1)
Sig Sec USA Dep (2)
Sig Dep (2)
Sig FLDMS (1)
Ft Richardson (ECOM Ofc) (1)
Units org under fol TOE:
(1 copy each)
11-16
11-57
11-97
11-98
11-117
11-500 AA-AC 2
29-134
29-136

NG: None
USAR: None
For explanation of abbreviations used, see AR 310-50.

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, FIELD AND DEPOT MAINTENANCE
TRAINER, RADAR AN/ULT-T2**

TM 11-6940-205-15
CHANGES No. 4

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *29 March 1963*

TM 11-6940-205-15, 19 April 1960, is changed as follows:

Note. The parenthetical reference to previous changes (example: "page 10 of C 1") indicates that pertinent material was published in that changes.

Page 1. Add paragraph 1-2.1 and 1-2.2 after paragraph 1-2.

1-2.1. Index of Publications

Refer to the latest issue of DA PAM 310-4 to determine whether there are new editions, changes or additional publications pertaining to your equipment. Department of the Army Pamphlet No. 310-4 is a current index of technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes and revisions of each equipment publication.

1-2.2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U. S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth N. J. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 26. Delete paragraphs 7-2, and 7-4, and table 7-1 and substitute:

7-2. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in this paragraph, 7-2.1, through 7-2.5, 7-3, and paras 7-5 through 7-8 cover systematic care essential to proper upkeep and operation of the equipment. The cleaning operations (par. 7-8) should be performed once a day. If the equipment is not used daily, however, the cleaning operations must be performed before operation of the equipment and after any extended shutdown, or once a week while the equipment is kept in standby condition. The other items must be checked before the equipment is placed in operation after a shutdown, during operation, or after it is turned off, as specified ill the applicable paragraph.

b. Maintenance Service and Inspection. The maintenance service and inspection charts (par. 7-2.2, 7-2.3, and 7-2.5) outline inspections to be made at specific intervals. These inspections are made to determine that the equipment is in good general (physical) condition, in good operating condition, and likely to remain combat serviceable. To assist operators and second echelon maintenance men in maintaining combat serviceability, the charts indicate what to inspect, how to inspect, and what normal conditions are; the References column lists the paragraph that contains additional information. If the defect cannot be remedied by the operator and second echelon maintenance mall, higher echelon maintenance or repair is required. Records and reports of these inspections must be made in accordance with TM 38-750.

7-2.1. Maintenance Service and Inspection Periods

Maintenance service and inspection of Trainer Radar AN/ULT-T2 is required daily. Paragraph 7-9.2

specifies the items to be inspected and serviced daily. Paragraph 7-2.3 specifies maintenance services and inspections that must be performed once each week. Preventive maintenance service and inspections of Trainer Radar, AN/'IULT-2 at the second echelon level are made at quarterly (par. 7-2.5) intervals unless otherwise directed by the commanding officer.

7-2.2. Daily Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	SET: Inspect the equipment for:		
	a. Completeness	*a.* Equipment must be complete	*a.* Par. 1 (page 9 of C 3).
	b. Proper installation	*b.* Installation is in accordance with paragraphs 5-1 through 5-6.	*b.* Par. 5-1 through 5-6.
	c. Cleanliness	*c.* Units must be clean and dry; free of grease, dirt, rust, corrosion, and fungus.	*c.* Par. 7-8.
	d. Preservation .	*d.* Painted surfaces must be free of bare spots rust, and corrosion.	*d.* Par. 7-6.
2	PUBLICATIONS: Check to see that pertinent publications are available.	*a.* Manual must be complete and in usable condition without missing pages.	*a.* None.
		b. All changes pertinent to the equipment are on hand (DA Pam 310-4).	*b.* DA Pam 310-4 for requirement.
3	KNOBS, DIALS, and SWITCHES: Check for proper mechanical action by setting each control to each of its possible settings.	Action is positive without backlash, binding, or scraping. *Note*. Knobs that require frequent tightening should have setscrews replaced.	
13	OPERATIONAL CHECK: Perform the operational procedures outlined in paragraph 2-19.	Equipment must perform normally as outlined in paragraph 2-19.	Paragraphs 2-9, 2-19, and Paras 4-1 through 4-6 and table 4-1.

7-2.3. Weekly Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
4	MOUNTING: Inspect seating and stability of mounting. Check for loose or missing hardware.	All bolts, nuts, and washers are present and properly tightened. Mounting shows no evidence of weakness or deformity.	
5	GASKETS: Inspect waterproof gaskets for leaks and worn, or loose edges.	Gaskets are clean, flexible, and in apparent good condition.	
6	CONNECTIONS: Check only external cable connections.	Connectors are clean, intact, and not loose fitting.	Par. 10-2.
7	CABLES: Inspect the external cables for cuts, kinks, breaks, and fraying.	Cables are not frayed, cut, broken, or kinked-	Par. 10-2.
8	METER and INDICATOR WINDOWS: Inspect the meter and indicator windows for breaks and dirt.	Window glass is free of dirt and not broken.	

7-2.4. Quarterly Maintenance

Quarterly maintenance on Trainer Radar, AN/ULT-T2 will be scheduled in accordance with the requirements of TM 38-750. All deficiencies or shortcomings will be recorded, and those not corrected during the inspection and service will be immediately reported to higher echelon by use of forms and procedures specified by TM 38-750. Equipment that has a deficiency that cannot be corrected by second echelon should be deadlined in accordance with TM 38-750. Perform all the services listed in the quarterly maintenance and inspection chart (par. 7-2.5) in the sequence listed. Whenever a *normal condition or result* is not observed, take corrective action in accordance with the paragraph listed in the *References* column.

7-2.5. Quarterly Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	SET: Inspect the equipment for:		
	a. Completeness	*a.* Equipment must be complete	*a*. Par. 1 (page 9 of C 3).
	b. Proper installation	*b.* Installation is in accordance with paragraphs 5-1 through 5-6.	*b*. Par. 5-1 through 5-6.
	c. Cleanliness	*c.* Units must be clean and dry; free of grease, dirt, rust, corrosion, and fungus.	*c.* Par. 7-8.
	d. Preservation	*d.* Painted surfaces must be free of bare spots, rust, and corrosion.	*d*. Par. 7-6.
2	PUBLICATIONS: Check to see that pertinent publications are available.	*a.* Manual must be complete and in usable condition without missing pages.	*a*. None.
		b. All changes pertinent to the equipment are on hand (DA Pam 310-4).	*b*. DA Pam 310-4 for requirement.
3	KNOBS, DIALS, and SWITCHES: Check for proper mechanical action by setting each control to each of its possible settings.	Action is positive without backlash, binding, or scraping. *Note*. Knobs that require frequent tightening should have setscrews replaced.	
4	MOUNTING: Inspect seating and stability of mounting. Check for loose or missing hardware.	All bolts, nuts, and washers are present and properly tightened. Mounting shows no evidence of weakness or deformity.	
5	GASKETS: Inspect waterproof gaskets for leaks and worn or loose edges.	Gaskets are clean, flexible, and in apparent good condition.	
6	CONNECTIONS: Check only external cable connections.	Connectors are clean, intact, and not loose fitting.	Par. 10-2.
7	CABLES: Inspect the external cables for cuts, kinks, breaks, and fraying.	Cables are not frayed, cut, broken, or kinked	Par. 10-2.
8	METER and INDICATOR WINDOWS: Inspect the meter and indicator windows for breaks and dirt.	Window glass is free of dirt and not broken.	
9	FUSES: Check for proper fuses	The fuses in use, and the spares, should be of the indicated value and located on the trainer front panel as follows: *a.* Three ea 3 amp in use. *b.* Three ea 3 amp spares.	Par. 9-1.
10	ANTENNA: Inspect the antenna for corrosion, loose fit. and damaged waveguide.	Antenna should not show signs of corrosion, loose fit, or damage.	
11	PLUCKOUT ITEMS: Inspect the seating of pluckout items.	All fuses and indicator lamps and lenses should be properly seated and correctly tightened.	
12	MODIFICATION WORK ORDERS: Check DA Pain 310-4 to determine if new applicable MWO's have been published.	All URGENT MWO's have been applied to the equipment. All routine MWO's have been scheduled.	DA Pam 310-4.
13	OPERATIONAL CHECK: Perform the operational procedures outlined in paragraph 2-1).	Equipment must perform normally as outlined in paragraph 2-19.	Paragraphs 2-9, 2-19, and Paras 4-1 through 4-6, and table 4-1.
14	SPARE PARTS: Check all spare parts (operator and organizational) for general condition and method of storage (page 11 of C 3).	All spare parts must be in good condition and properly stored. There should be no evidence of overstock, and all shortages will be on valid requisitions.	Page 11 of C 3.

Appendix I (page 10 of C1). Make the following changes:

Paragraph 13, first sentence. Delete "paragraph 14" and substitute "paragraphs 7-2, 7-2.1 through 7-2.5, 7-3, and paras 7-5 through 7-8."
Paragraph 14*a*. Delete subparagraph *a*.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DASA (6)
USASA (2)
CNGB (1)
CofEngrs (1)
TSG (1)
CSigO (7)
CofT (1)
USA CD Agcy (1)
USCONARC (5)
USAMC (5)
USAECOM (5)
USAMICOM (4)
ARADCOM (2)
ARADCONM Rgn (2)
OS Maj Comd (3)
OS Base Comd (2)
LOGCOMD (2)
MDW (1)
Armies (2)
Corps (2)
USA Corps (3)
Instl (2) except
Ft Monmouth (63)
USATC AD (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
Svc Colleges (2)
Br Svc Sch (2)
GENDEP (OS) (2)
Sig Dep (OS) (12)
Army Dep (2) except
Ft Worth (8)
Lexington (12)
Sacramento (17)
Tobyhanna (12)
Sig Sec, GENDEP (OS) (5)
USA EIct RD Actv (Ft Huachuca) (2)
USA Elct RD Actv (White Sands) (13)
WRAMC (1)
Army Pic Cen (2)
USA Mbl Spt Cen (1)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
USAOSA (I)
AFIP (1)
AMS (1)
USA Elct Mat Agcy (25)
Chicago Proc Dist (1)
USASSC (4)
USARCARIB Sig Agcy (1)
Sig Fld Maint Shops (3)
JBUSMC (2)
Units org under fol TOE's: (2 cy ea)
11-7
11-16
11-57
11-97
11-98
11-117
11-155
11-157
11-500 (AA-AC, RM-RU)
11-557
11-587
11-592
11-597

NG: State AG (1).
USAR: None.
For explanation of abbreviations used, see AR 320-50.

803-927

TECHNICAL MANUAL

Operator's, Organizational, Field, and Depot Maintenance
TRAINER RADAR AN/ULT-T2

TM 11-6940-205-15
CHANGES NO. 3

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *23 May 1962*

TM 11-6940-205-15, 19 April 1960, is changed as follows:

APPENDIX II

MAINTENANCE ALLOCATION

TRANSMITTING SET, COUNTERMEASURES TRAINING SIGNAL AN/ULT-T2, AND AS-1057/ULT-T2
(Superseded)

Section I. INTRODUCTION

1. General

a. This section assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Component.* This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in topdown order. That is, the assemblies which are part of a component are listed immediately below that component and the subassemblies which are part of an assembly. Each generation breakdown (components, assemblies, or subassemblies) are listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelons.

(a) *Service*. To clean, to preserve, and to replenish lubricants.

(b) *Adjust*. To regulate periodically to prevent malfunction.

(c) *Inspect*. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) *Replace.* To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(f) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

*** These changes supersede C 2, 28 July 1961.**

(g) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) *Calibrate*. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) *Overhaul.* To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, 5th echelon*. The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon-marked by X are authorized to perform the indicated operation.

(4) *Tools required*. This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks*. Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding column.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions*. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon*. The dagger (†) symbol in these columns indicates the echelons normally allocated the facility.

(3) *Tool code*. This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

SECTION II MAINTENANCE ALLOCATION CHART (AN/ULT-T2)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
TRANSMITTING SET, COUNTERMEASURES TRAINING SIGNAL AN ULT-T2	inspect	X						
	repair			X			1, 3, 9	
	rebuild					X	1, 3, 9	
	overhaul				X		1 .3, 9	
TRANSMITTER COUNTERMEASURES SIGNAL T-883/ULT T2	adjust		X				2, 7, 10	
	inspect	X						
	test		X				2, 7, 10	
	repair	X					1, 3, 4, 5, 7, 9	
	align		X				1, 3, 4, 5, 7, 9	
	calibrate		X				1, 3, 4, 5, 7, 9	
	rebuild		X				1, 3, 4, 5, 6, 8, 9, 11	
	overhaul				X		1, 3, 4, 5, 7, 9, 11	
ANTENNA AS 1057/ULT-T2	inspect		X					
	test			X			2, 10	
	repair			X			1, 3, 4, 5, 7, 9	
	rebuild					X	1, 3, 4, 5, 6, 8, 9, 11	
	overhaul				X		1, .3, 4, 5, 7, 9, 11	
CABLE ASSEMBLIES	inspect	X						
	test		X				2, 10	
	repair			X			1 ,3, 9	
	rebuild			X			1, 3, 9	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
AN/ULT-T2 (continued)								
CASE, RADAR SET CY-3543/ULT-12	inspect repair rebuild overhaul	X		X		X	9 9 9	
HEADSET, ELECTRICAL H-113/U	inspect test repair rebuild overhaul	X	X	X		X	2, 10 1, 3, 9 1, 3, 9 1, 3, 9	
HORN, WAVEGUIDE	inspect repair overhaul	X			X	X	9 9	
POWER MONITOR	inspect test repair rebuild overhaul	X	X	X		X	2, 10 1, 3, 4, 5, 7, 9 1, 3, 4, 5, 6, 8, 9, 11 1, 3, 4, 5, 7, 9, 11	

SCETION III ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS (AN/ULT-T2)

Tools Required For Maintenance Functions (1)	1st ech. (2)	2nd ech. (3)	3rd ech. (4)	4th ech. (5)	5th ech. (6)	Tool Code (7)	Remarks (8)
AN/ULT-T2 (continued)							
ELECTRONIC MULTIMETER ME-26/U			†	†	†	1	
MULTIMETER AN/URM-105		†				2	
MULTIMETER TS-352/U			†	†	†	3	
OSCILLOSCOPE AN/USM-50			†	†	†	4	
TEST SET, RADAR TS-147/UP			†	†	†	5	
TEST SET, ELECTRON TUBE TV-2/U					†	6	
TEST SET, ELECTRON TUBE TV-7/U		†	†	†		7	
TEST SET, ELECTRON TUBE TV-13/U					†	8	
TOOL KIT TK-87/U			†	†	†	9	
TOOL KIT TK-115/U		†				10	
PHASE SHIFTING NETWORK				†	†	11	Phase Shifting Network schematic diagram appears in TM for AN/ULT-T2 page 38 and is to be fabricated by the repair facility. NOTE: 3d echelon maintenance to be provided by direct Support Organizations.

SECTION IV MAINTENANCE ALLOCATION CHART (AS-1057/ULT-T2)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
ANTENNA, TRAINING DEVICE AS-1057/ULT-T2								
	service		X				3	
	adjust		X				3	
				X			4	
	inspect	X						
	test		X					
				X			2	
					X		2	
						X	2	
	replace		X				4	
	repair				X		4	
	rebuild					X	4	
	overhaul				X		4	
ANTENNA MOUNT ASSEMBLY	repair				X			
	rebuild					X		
CLAMP	replace		X					
INSERT, ANTENNA MOUNT	replace		X					
PIN, GROOVED, HEADLESS	replace		X					
SUPPORT, ANTENNA	replace		X					
	rebuild					X		
CABLE	replace			X				
CONNECTORS	replace			X				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
AS-1057/ULT-T2 (continued)								
NUT	repair				X			Available in std maint kits
SCREW	replace		X					(Nylon)
SCREWS	repair				X			Available in std maint kits
WASHERS	repair				X			Available in std maint kits
YOKE, ANTENNA MOUNT	replace		X					
HORN, WAVEGUIDE ASSEMBLY	repair				X			
	rebuild					X		
CONNECTOR	replace		X					
WASHER	replace				X			Available in std maint kits
HORN, WAVEGUIDE	replace		X					
REFLECTOR ASSEMBLY	repair				X			
	rebuild					X		
REFLECTOR. ANTENNA	replace		X					
	rebuild					X		
SUPPORT ASSEMBLY	repair				X			
	rebuild					X		
BRACKETS	rebuild					X		Fabricate
NUT	replace		X					Available in std maintenance kits
SCREW	replace				X			Available in std maintenance kits
SUPPORT	rebuild					X		Fabricate
WASHER	replace				X			Available in std maintenance kits
THUMB SCREW	replace		X					(Loose item)

SECTION V ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

Tools Required For Maintenance Functions (1)	1st ech. (2)	2nd ech. (3)	3rd ech. (4)	4th ech. (5)	5th ech. (6)	Tool Code (7)	Remarks (8)
AS-1057/ULT-T2 (continued)							
MULTIMETER AN/URM-105		†				1	
MULTIMETER TS-352/U			†	†	†	2	
TOOL EQUIPMENT-41		†				3	
TOOL KIT TK-87/U			†	†	†	4	

APPENDIX III

BASIC ISSUE ITEMS LIST FOR TRANSMITTING SET, COUNTERMEASURES TRAINING SIGNAL AN/ULT-T2 (Superseded)

Section I. INTRODUCTION

1. Scope

a. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model*. Not used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

(5) *Unit of issue.* The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Nonexpendable items are indicated by NX. Expendable items are not annotated.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items," the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustration.* The Item No. column lists the reference symbols used for identification of the items in the illustration or text of the manual.

2. References

Additional instructions concerning maintenance of this equipment are contained in TM 11-5965-231-15P, Headset, Electrical H-113/U.

3. Comments or Suggestions

Any comments concerning omissions and discrepancies in appendixes II and III will be prepared on DA Form 2028 and forwarded direct to Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J.

SECTION II FUNCTIONAL PARTS LIST (AN/ULT-T2)

(1) SOURCE MAINT AND RECOV CODE	(2) FEDERAL STOCK NO.	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPEND-ABILITY	(7) QTY AUTH	(8) ILLUS-TRATIONS FIG. NO.	(9) ILLUS-TRATIONS ITEM NO.
	6940-856-8176		TRANSMITTING SET, COUNTERMEASURES TRAINING SIGNAL AN/ULT-T2		NX			
			ITEMS COMPRISING AND OPERABLE EQUIPMENT					
	Ord thru AGC		TECHNICAL MANUAL TM 11-6940-205-12P			2		
	6940-856-8177		TRANSMITTER COUNTERMEASURES TRAINING SIGNAL T-883/ULT-T2: A0 and A9 emission: 8500 to 9600 mc freq range: 105 to 120v, 48 to 62 cps or 390 to 450 cps: single ph; Rett Electronics No. R-1448-2060		NX	1		
	6940-473-5284		ANTENNA AS-1057/ULT-T2		NX	1		
	6150-160-5549		CABLE ASSEMBLY, POWER, ELECTRICAL CX-7784/U: 25 It lg: Rett Electronics part/dwg No. R-1448-3/35			1		
	5995-823-3096		CABLE ASSEMBLY, RADIO FREQUENCY CG-92F/U: 7 ft 6 in lg: Sig dwg SC-D 2329			1		
	5995-823-3095		CABLE ASSEMBLY, RADIO FREQUENCY CG-2391/U: 12 in lg: Rett Electronics No. R 1448-2131			1		
	6940-877-4868		CASE, RADAR SET CY-3543/ULT-T2: Rett part dwg No. R 1448-2177			1		
	5965-504-6370		HEADSET ELECTRICAL H-113/U		NX	1		
	6940-877-2944		POWER MONITOR: Rett part/dwg No. R-1448-3243			1		
			TRANSMITTER, COUNTERMEASURES TRAINING SIGNAL T-883/ULT-T2					
	5960-503-4880		ELECTRON TUBE: MIL type 0A2WA			1		V209
	5960-262-1703		ELECTRON TUBE: MIL type 5R4WGA			1		V401
	5960-542-7004		ELECTRON TUBE: MIL type 6AH6WA			1		V206
	5960-262 0152		ELECTRON TUBE: MIL type 6AU6WA			6		See desc column
			Item Nos. V101, V102, V202, V205, V302, V305					
	5960-108-0263		ELECTRON TUBE: MIL type 6D4			1		V201
	5960-262-0161		ELECTRON TUBE: MIL type 6L6WGB			1		V406
	5960-272-9182		ELECTRON TUBE: MIL type 6X4WA			2		V404
	5960-262-0167		ELECTRON TUBE: MIL type 12AT7WA			2		V204 V304
	5960-262-0286		ELECTRON TUBE: MIL type 5651WA			1		V408
	5960-284-5842		ELECTRON TUBE: MIL type 5751WA			2		V403 V407

(1) SOURCE MAINT AND RECOV CODE	(2) FEDERAL STOCK NO.	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPEND-ABILITY	(7) QTY AUTH	(8) ILLUS-TRATIONS FIG. NO.	(9) ILLUS-TRATIONS ITEM NO.
			AN/ULT-T2 (continued)					
	5960-262-0210		ELECTRON TUBE: MIL type 5814A			3		V203 V208 V210
	5960-262-0181		ELECTRON TUBE: MIL type 6080WA			2		V402 V410
	5960-669-6861		ELECTRON TUBE: MIL type 6005/6AQ5W			2		V103 V207
	5960-557-6780		ELECTRON TUBE: MIL type 6100/664WA Item Nos. V211, V301, V306, V306			4		See desc column
	5920-583-8486		FUSE, CARTRIDGE: MIL type F03G3R00B			6		F401 thru F406
	6240-223-9100		LAMP, GLOW: MIL type NE-51			1		DS402
	6240-155-8706		LAMP, INCANDESCENT: MIL type MS-15571-2			1		DS401
			RUNNING SPARES AND ACCESSORY ITEMS					
			TRANSMITTING SET, COUNTERMEASURES TRAINING SIGNAL AN/ULT-T2 TRANSMITTER, COUNTERMEASURES TRAINING SIGNAL T-883/ULT-T2					
	5960-503-4880		ELECTRON TUBE: MIL type 0A2WA			1		V209
	5960-262-1703		ELECTRON TUBE: MIL type 5RWGA			1		V401
	5960-542-7004		ELECTRON TUBE: MIL type 6AH6WA			1		V206
	5960-262-0152		ELECTRON TUBE: MIL type 6AU6EA Item Nos. V101, V102, V202, V205, V302, V305			2		See desc column
	5960-108-0263		ELECTRON TUBE: MIL 6D4			1		V201
	5960-262-0161		ELECTRON TUBE: MIL type 6L6WGB			1		V406

(1) SOURCE MAINT AND RECOV CODE	(2) FEDERAL STOCK NO.	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPEND-ABILITY	(7) QTY AUTH	(8) (9) ILLUS-TRATIONS FIG. NO.	ITEM NO.
			AN/ULT-T2 (continued)					
	5960-272-9182		ELECTRON TUBE: MIL type 6X4WA			1		V404 V405
	5960-262-0167		ELECTRON TUBE: MIL type 12AT7WA			1		V204 V304
	5960-262-0286		ELECTRON TUBE: MIL type 5651WA			1		V408
	5960-284-5842		ELECTRON TUBE: MIL type 5751WA			1		V403 V403
	5960-262-0210		ELECTRON TUBE: MIL type 5814A			1		V403 V208 V210
	5060-262-0181		ELECTRON TUBE: MIL type 6080WA			1		V402 V410
	5960-669-6861		ELECTRON TUBE: MIL type 6005/6AQ5W			1		V103 V207
	5960-577-6780		ELECTRON TUBE: MIL type 6100/664WA Item Nos. V211, V301, V303, V306			2		See desc column
	5920-583-8486		FUSE, CARTRIDGE: MIL type F03G3R00B			10		F401 thru F406
	6240-223-9100		LAMP, GLOW: MIL type NE-51			1		DS402
	6240-155-8706		LAMP, INCANDESCENT: MIL type MS-15571-2			1		DS401

SECTION III FUNCTIONAL PARTS LIST (AS-1057/ULT-T2)

(1) SOURCE MAINT AND RECOV CODE	(2) FEDERAL STOCK NO.	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPEND-ABILITY	(7) QTY AUTH	(8) ILLUS-TRATIONS FIG. NO.	(9) ILLUS-TRATIONS ITEM NO.
	6940-473-5284		ANTENNA AS-1057/ULT-T2					
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			ANTENNA AS-1057/ULT-T2: Transmits signal from the Trainer Antenna to the Antenna of the Set: 7.36 to 10.0 KMC freq range: designed for tripod mtg; Polarad Elec part No. D104272:					
			ANTENNA AS-1057/ULT-T2: (BASIC COMPONENT)		NX	1		
	Order three AGC		TECHNICAL MANUAL TM 11-6940-205-1			2		
			RUNNING SPARES AND ACCESSORY ITEMS					
			ANTENNA RS-1057/ ULT-T2					
			NO PARTS AUTHORIZED FOR STOCKAGE AT FIRST ECHELON					

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

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DASA (6)
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CNGB (1)
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Tech Stf Bd (1)
USCONARC (5)
USAARTYBD (1)
USAARMBD (2)
USAIB (1)
USARADBD (2)
USAAVNBD (1)
USAABELCTBD (1)
USAATBD (1)
ARADCOM (2)
ARADCOM, Rgn (2)
OS Maj Comd (3)
OS Base Comd (2)
LOGCOMD (2)
MDW (1)
Armies (2)
Corps (2)
Instl (2)
Fort Monmouth (63)
USATC AD (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USATC FA (2)
USAOMC (3)
Svc Colleges (2)
Br Svc Sch (2)
GENDEP (2) except
Atlanta GENDEP (none)
Sig Sec, GENDEP (5)
Sig Dep (12)
WRAMC (1)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
OSA (1)
USAEPG (2)
AFIP (1)
AMS (1)
Army Pictorial Cen (2)
EMC (1)
Yuma Test Sta (2)
USA Strat Comm Comd (4)
USASSA (20)
USASSAMWO (1)
USA Caribbean Sig Agcy (1)
USA Sig Msl Spt Agcy (13)
Sig Fid Maint Shops (3)
USA Corps (3)
Def Log Svc Cen (1)
JBUSMC (2)
Units org under fol TOE
(2 cy ea)
11-7
11-16
11-57
11-98
11-117
11-155
11-157
11-500 (Tms AA-AE &
RM-RT)
11-557
11-592
11-597
11-597

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

TECHNICAL MANUAL
OPERATOR'S, ORGANIZATIONAL, FIELD AND DEPOT MAINTENANCE
TRAINER RADAR AN/ULT-T2

TM 11-6940-205-15

CHANGES NO. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *2 February 1961*

TM 11-6940-205-15, 19 April 1960, is changed as indicated below to incorporate installation, operation, and maintenance information on Antenna AS-1057/ULT-T2 (antenna training device). Antenna AS-1057/ULT-T2 is used in conjunction with Radar Trainer AN/ULT-T2.

Page 129. Add the following appendixes:

APPENDIX I
INSTALLATION, OPERATION, AND MAINTENANCE OF ANTENNA AS-1057/ULT-T2

Section I. INTRODUCTION

1. Scope

This appendix describes Antenna AS-1057/ULT-T2 (fig. 1) and covers its installation, operation, and maintenance. Assignment of the antenna training device maintenance functions is covered in the maintenance allocation chart (app. II).

2. General Description
(fig. 1)

a. The antenna training device is composed of a parabolic reflector (Polaroid model CA-R), directional antenna (Polaroid model CA-X), and Cable Assembly CG-545/U. It is supplied for use with Radar Trainer AN/ULT-T2 (Radar Signal Interference Trainer (X-Band) Device 15X12).

b. The directional antenna (horn antenna) is a highly directional horn antenna operating in the 7.36- to 10.0-kmc frequency range. The horn antenna is fed by a section of waveguide with inside dimensions that are slightly smaller than the standard X-band waveguide. The waveguide is terminated at one end with a waveguide-to-coaxial adapter which contains a female type N connector. A dielectric cover prevents dirt and dust from accumulating in the horn antenna.

c. The parabolic reflector provides an increase of directivity and gain over that of the horn antenna. Holes in the parabolic reflector decrease its wind resistance. The diameter of these holes and their relative location have been designed to minimize any back radiation. The parabolic reflector contains a bracket for mounting the antenna to a tripod, mast, or other suitable support. Three dielectric supporting rods attached to the parabolic reflector support the horn antenna.

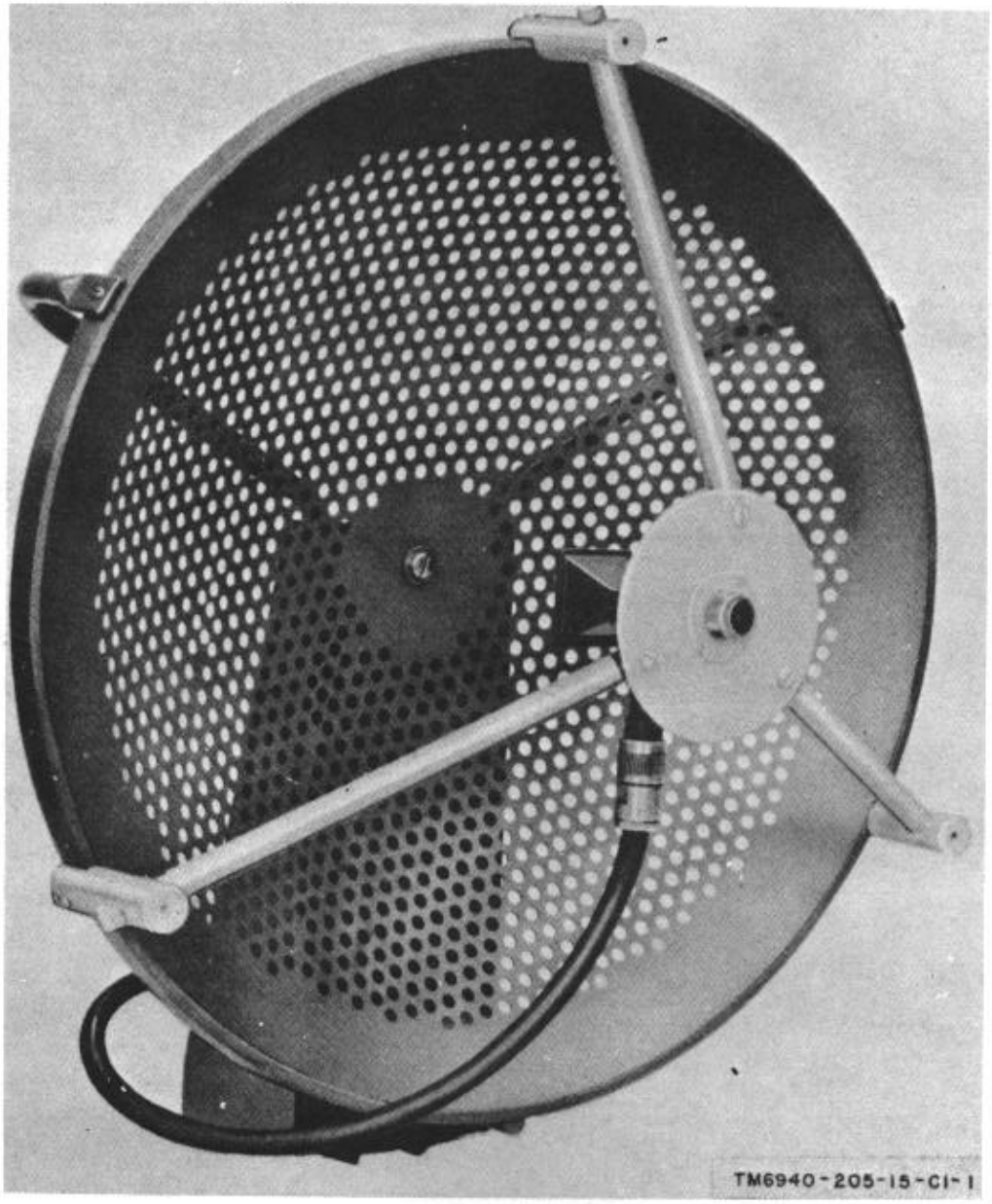

Figure 1. Antenna AS-1057/ULT-T2

3. Technical Characteristics

Frequency range	7.36 to 10.0 kmc.
Nominal input impedance	50 ohms.
Gain	. 28 db at 9 kmc.
Power input to antenna	Limited by rf coaxial cable assembly employed.
Beam width.....	5° E-plane - 4° H-plane at 7.36 kmc. 4° E-plane - 3° H-plane at 8 kmc. 4° E-plane - 3° H-plane at 9 mc. 4° E-plane - 3° H-plane at 10 kmc.
Back lobe attenuation	Better than 20 db.
Side lobe attenuation	Better than 20 (lb.

4. Components of Antenna AS-1057/ULT-2T

Quantity	Item	Height (in.)	Width (in.)	Depth (in.)	Unit weight (lb.)
1	Parabolic reflector	20-13/16	19-15/16	13-7/16	2
1	Horn antenna	2-1/2	1-1/2	3-3/8	0.5
1	Cable Assembly (26 in.) CG-545/U				1

Section II. INSTALLATION AND OPERATION

5. Packaging Data

When packed for shipment, Antenna AS1057/ULT-T2 is placed in a water-resistant, fiberboard sealed container which is wrapped in water-resistant paper and then packed in a heavy duty fiberboard carton and sealed. A typical shipping box and its contents are shown in figure 2. The box is 14 5/8 inches by 21 1/8 inches by 22 inches, and 3.9 cubic feet. The total weight is 5 pounds.

6. Unpacking

a. Open the fiberboard box and then the moisture vaporproof barrier that covers the carton inside the box. Remove the carton.

b. Open the inner carton and remove the contents. Be careful when removing equipment from the carton, so as not to drop or damage any pieces that might have jarred loose during shipment.

c. Preserve the original cartons so that they may be reused for repacking the equipment, if required.

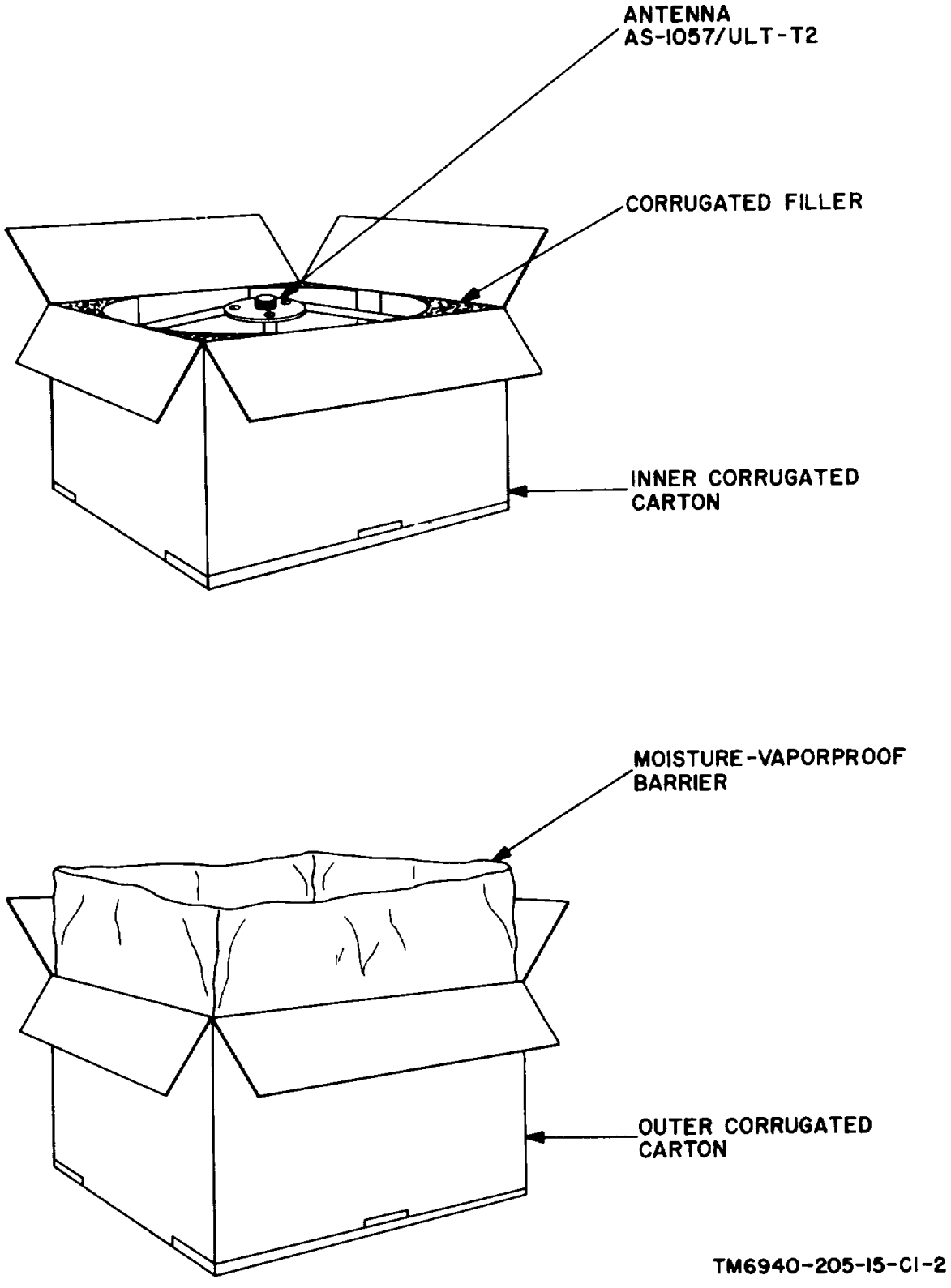

Figure 2. Typical packaging illustration.

7. Mounting Horn Antenna on Parabolic Reflector (fig. 5)

Note.

Complete disassembly and reassembly of the antenna training device is explained in paragraphs 15 and 16.

a. Connect Connector UG-21D/U (15) on one end of Cable Assembly CG-545/U to the connector assembly (14) mounted on the horn antenna.

b. Gently push the back of the horn antenna (7) into the hole in the insert (3) mounted inside the antenna yoke (4).

c. While holding the horn antenna in one hand, secure it to the insert with the thumbscrew (1) and washer (2).

d. Check the distance between the center of the window (8) on the horn antenna and the screw (18) at the center of the parabolic reflector (20). This distance should be 5 3/4 inches plus or minus 1/16. If the distance is not correct, proceed as follows:

(1) Use a screwdriver and gently loosen the strap clamp (6) mounted on the antenna yoke.

(2) Adjust the distance between the center of the window (8) and the screw (18) at the center of the parabolic reflector by gently pushing the insert (3) in or out, as required.

(3) Tighten the strap clamp after adjustment has been made.

8. Operating Instructions

a. Connect plug P501 on rf cable W601 supplied with Radar Trainer AN/ULT-T2 to Connector UG-22B/U (item 35, fig. 5) on the antenna support assembly.

b. Connect plug P309 on the other end of rf cable W601 to the RF OUTPUT jack on the front panel of the radar trainer.

c. Operate Antenna AS-1057/ULT-T2 the same way horn antenna A801 (supplied with Radar Trainer AN/ULT-T2) is operated.

Section III. THEORY OF OPERATION

9. Horn Antenna

The horn antenna consists of a waveguide feed horn flared in the E-plane. The pyramidal construction of the horn allows a gradual transition of impedance between the waveguide and free space.

10. Parabolic Reflector

The parabolic reflector is used as a directional device. The geometry of the parabolic reflector is such that the focus point of the parabola is at a distance of 53/4 inches from the center of the parabola. With the horn antenna mounted at the focus point of the parabola, the rf energy radiated by the horn antenna is reflected by the parabolic reflector and concentrated into a directional beam.

11. Radiation Pattern

Figure 3 is a plot of the radiation pattern when the horn antenna is mounted on the parabolic reflector. The pattern is defined in terms of the field intensity at a fixed distance about the antenna, for a given input power to the antenna. The graph shows that the radiated beam is highly directive.

12. Gain Versus Frequency

A graph of gain versus frequency for Antenna AS-1057/ULT-T2 is shown in figure 4. The graph shows that the gain of the system steadily increases from 27 db at the low end of the frequency range to 29.6 db at the high end. The gain at any particular frequency within the range of the antenna can be read directly from the graph by locating the desired frequency on the horizontal axis and reading the corresponding gain in db on the vertical axis.

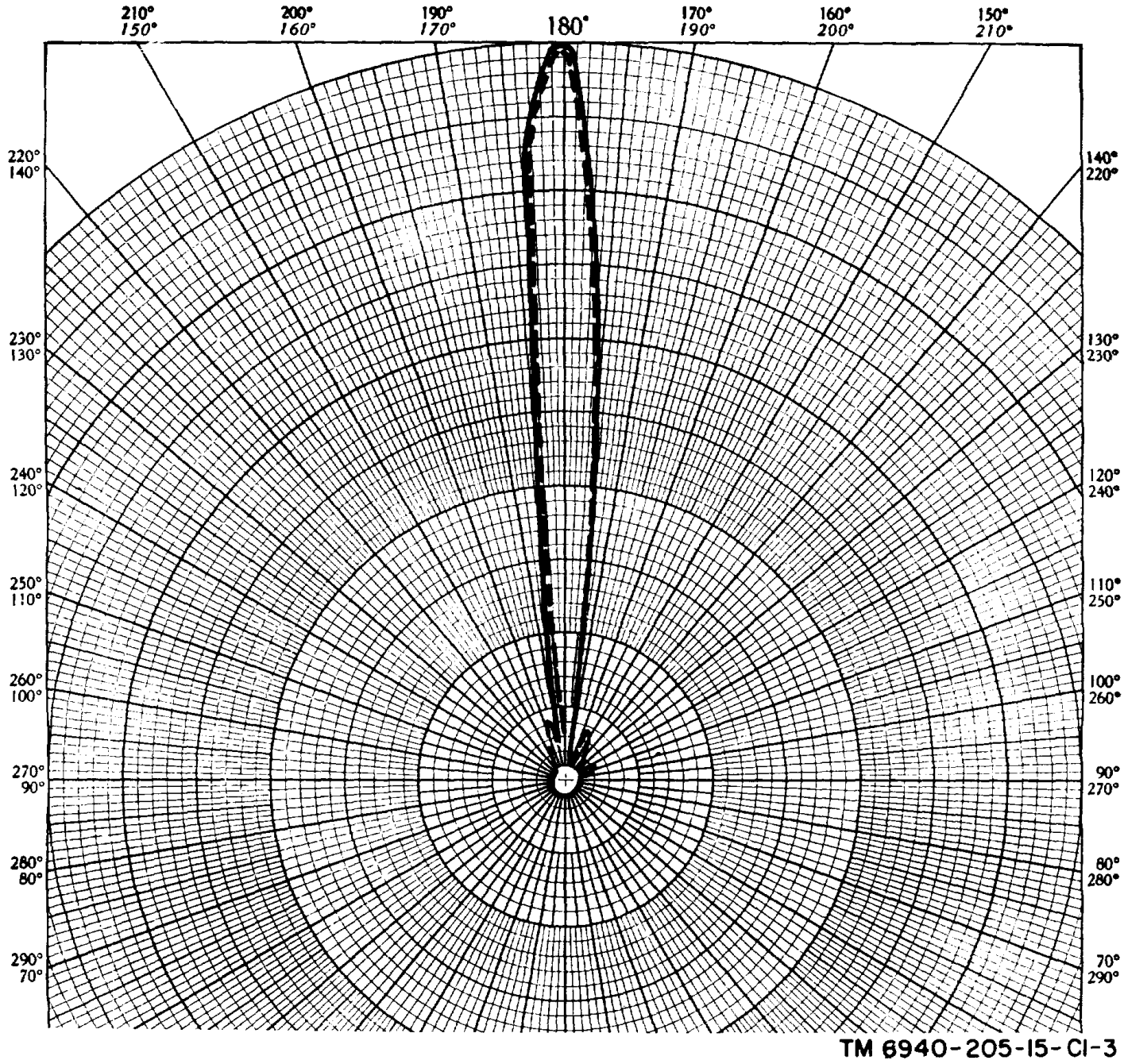

Figure 3. Field intensity pattern of antenna training device.

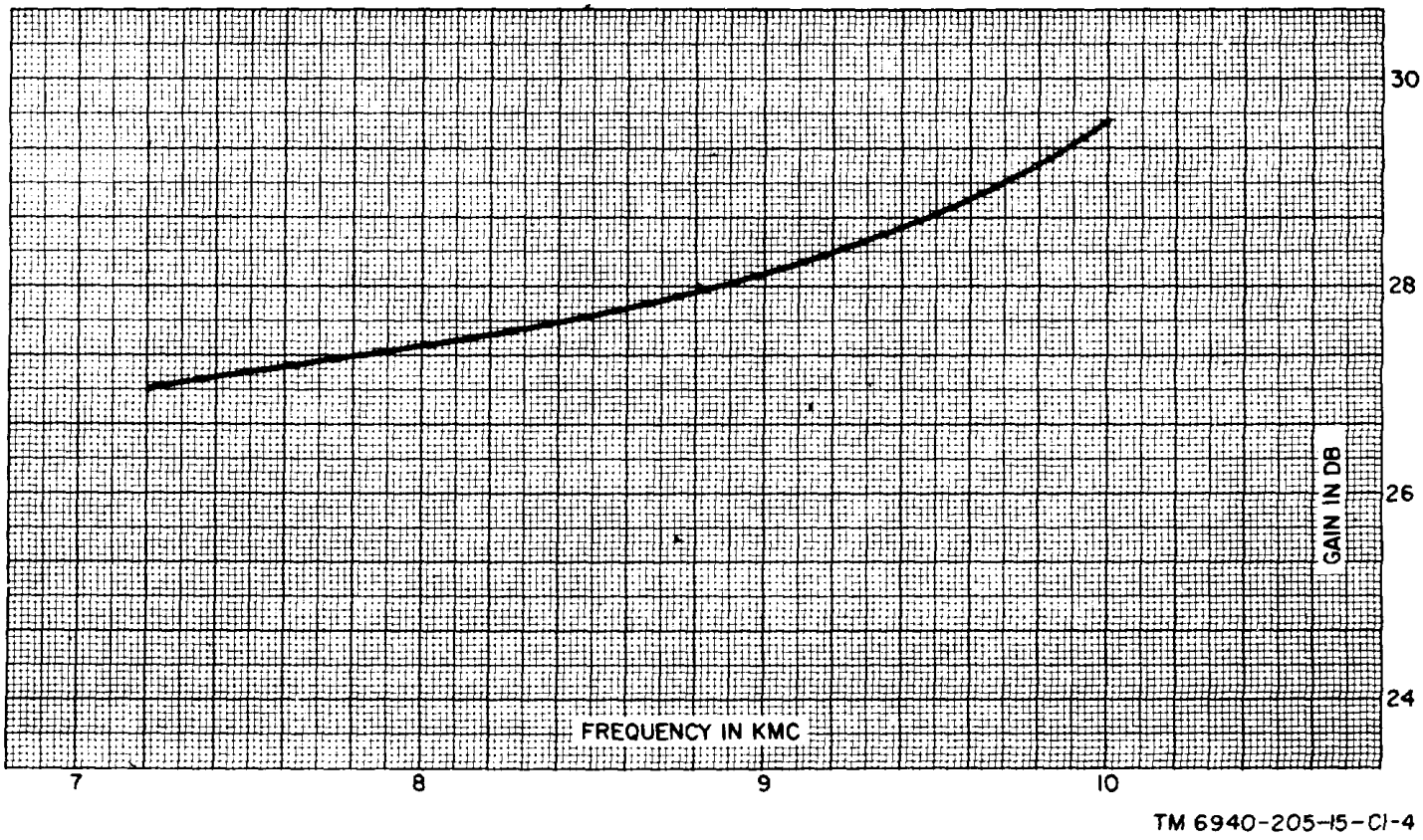

Figure 4. Gain versus frequency curve for antenna training device.

Section IV. MAINTENANCE

13. General

To insure continuous trouble-free operation, the preventive maintenance procedures outlined in paragraph 14 must be adhered to. In addition, an accurate log in which all failures, modifications, and observations concerning the antenna training device are entered should be kept. This log will serve as a valuable source of operational and maintenance information. When it is necessary to replace worn or damaged parts, refer to disassembly and reassembly procedures contained in paragraphs 15 and 16.

14. Preventive Maintenance

a. Periodic checks.

What to check	Possible defect	Remedy
Parabolic reflector	Visually inspect antenna support assembly for loose supporting brackets.	Tighten all loose Supports.
Rf cable	Visually check for frayed or close ends and signs of deterioration	Replace defective cable.
Antenna mounting	Visually check for loose strap clamp and thumbscrew. Also check for loose supporting rods.	Tighten all connections

b. Touching Up and Refinishing. If the painted finish on the parabolic reflector or horn antenna becomes badly scarred or damaged, corrosion may be prevented by touching up the bare spots with paint. Use a No. 00 or No. 000 sandpaper to clean the surface down to the bare metal. Retouch with paint.

c. Cleaning. The equipment can easily be cleaned without disassembling. Wipe all dust off with a dry cloth. If dirt or corrosion exists which cannot be removed with a dry cloth, use a clean cloth slightly moistened with cleaning compound to clean the equipment. Then wipe thoroughly dry.

15. Disassembly of Antenna AS-1057/ULT-T2 (fig. 5)

a. Disconnect the connector (15) from the horn antenna and remove the thumbscrew (1) and washer (2). Remove the antenna horn by gently pulling it toward the center of the reflector.

b. To remove the protective window (8) from the mouth of the horn antenna (7), remove the eight screws (9) that hold it in place. Remove the connector assembly (14) by loosening the locking nut (13) and unscrewing the connector assembly.

c. To remove the antenna yoke (4), remove the three screws (16) which mount the antenna yoke to the parabolic reflector by means of the three supporting rods (17). Then remove the insert (3) from the antenna yoke (4) by loosening and removing the strap clamp (6) and then removing the guide pin (5). The insert should now push out easily.

d. Remove the three supporting rods (17) from the upright rods (24) by loosening the setscrews (27). Then remove the upright rods by removing the screws (23), washers (25), and nuts (26) that mount them to the reflector assembly.

e. Remove Cable Assembly CG-545/U from the antenna support assembly (30) by removing the four screws (34), washers (36), and nuts (37) which mount it. Remove the support bracket (31) by removing the screw (28) and washer (29) that secure it to the antenna support and the screws (32) that secure it to parabolic reflector. Remove righthand bracket (39) by removing the screws (38), washers (40), nuts (41), and screw (42). Remove lefthand bracket (44) by removing the screws (43), washers (45), nuts (46), and screw (42). Remove the parabolic reflector (20) from the antenna support assembly (30) by removing the screw (18), washers (19 and 21), and nut (22).

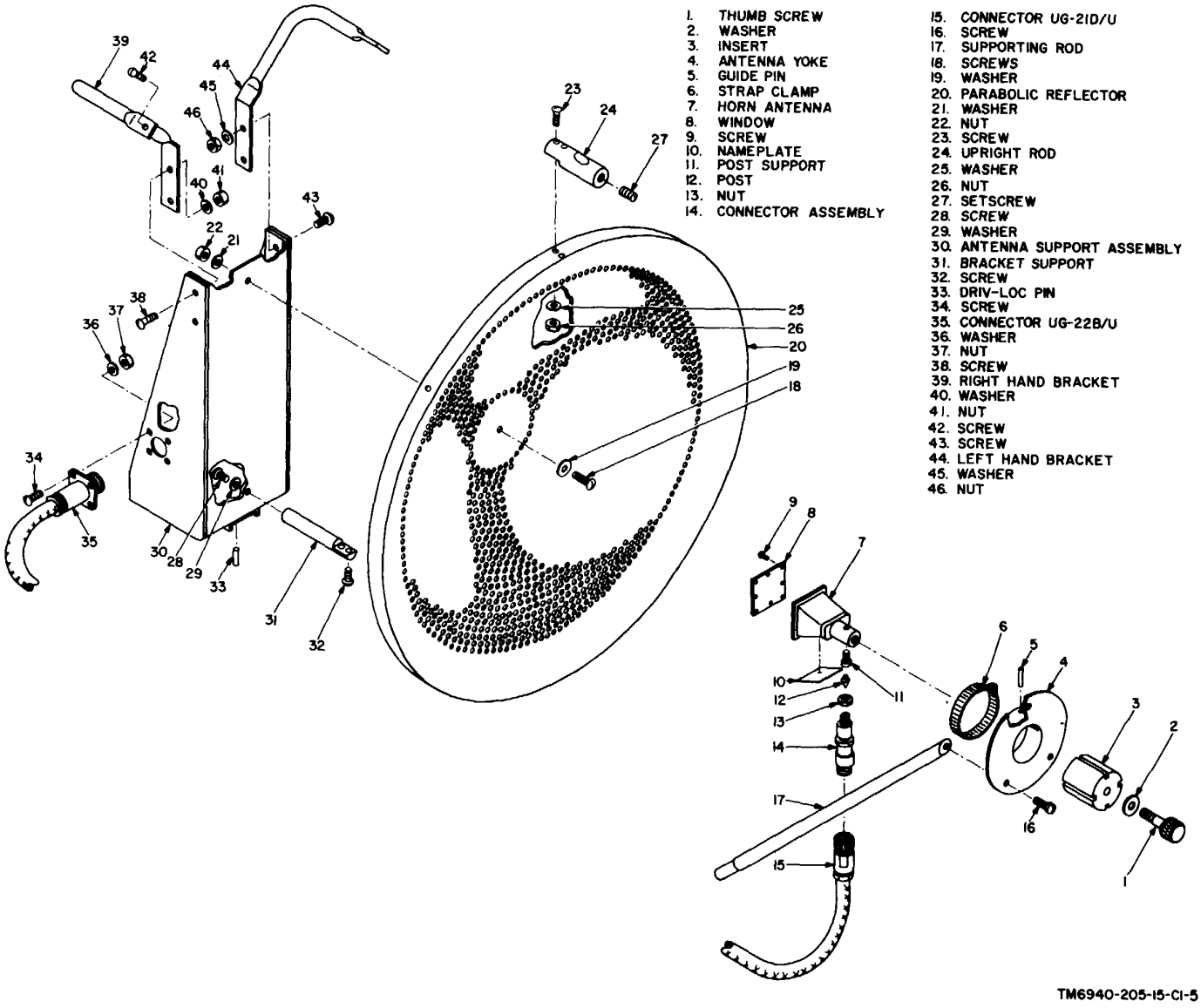

Figure 5. Antenna AS-1057/ULT-T2, exploded view.

16. Reassembly of Antenna AS-1057/ULT-T2

(fig. 5)

a. Secure the parabolic reflector (20) to the antenna support assembly (30) with the screw (18), washers (19 and 21), and nut (22). Secure one end of each supporting bracket (39 and 44) to the antenna support assembly with the screws (38 and 43), washers (40 and 45), and nuts (41 and 46). Secure the other end of each supporting bracket (39 and 44) to the parabolic reflector with a screw (42). Secure the support bracket (31) to the antenna support assembly with the screw (28) and washer (29). Secure the other end of the support bracket (31) to the parabolic reflector with the two screws (32). Attach Cable Assembly CG-545/U to the antenna support assembly with the four screws (34), washers (36), and nuts (37).

b. Secure the three upright rods (24) to the parabolic reflector with the screws (23), washers (25), and nuts (26). Insert the three supporting rods (17) into the openings in the upright rods and secure with the setscrews (27).

c. Secure the antenna yoke (4) to the three supporting rods with the three screws (16). Insert the guide pin (5) into the opening in the top of the antenna yoke, and gently slide the insert (3) into the antenna yoke. Loosely hold the insert in place with the strap clamp (6).

d. Secure the protective window (8) to the mouth of the thorn antenna (7) with eight screws (9), and secure the connector assembly (14) to the bottom of the horn antenna by carefully screwing it into the horn antenna and tightening the locking nut (13). Then gently slide the horn antenna into the opening in the insert, and secure with the thumbscrew (1) and washer (2).

e. Connect Connector UG-21D/U (15) on Cable Assembly CG-545/U to the connector assembly mounted on the bottom of the antenna horn.

f. Adjust the position of the horn antenna for a distance of 53/4 inches between the center of the window (8) and screw (18) at the center of the parabolic reflector by gently pushing the insert (3) in or out, as required.

g. Tighten the strap clamp (6).

APPENDIX II
MAINTENANCE ALLOCATION CHART, ANTENNA AS-1057/ULT-T2

Section I. MAINTENANCE ALLOCATION

1. General

a. This section assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns are as follow:

(1) *Part or component*. This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical order with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function*. This column indicates the various maintenance functions allocated to the echelon capable of performing the operation.

(a) Service. To clean, preserve and replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by .scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(g) Aline. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(j) Overhaul. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(3) *1st, 2d, 3d, 4th, 5th echelons*. The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required*. This column indicates

codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicate the tool, test, and maintenance equipment required to perform the maintenance function.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones, to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of this maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

4. Comments and Suggestions

Any comments concerning omissions and discrepancies in this change will be prepared on DA Form 2028 and forwarded direct to Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-LM, Fort Monmouth, N. J.

SECTION II MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
ANTENNA, AS-1057/ULT T2								
	service		X				3	
	adjust		X				3	
				X			4	
	inspect	X						
	test		X				1	
				X			2	
					X		2	
						X	2	
	replace		X				3	
	repair				X		4	
	rebuild					X	1	
	overhaul				X		4	
ANTENNA MOUNT ASSEMBLY	repair				X			
	rebuild					X		
CLAMP	replace		X					
INSERT, ANTENNA AMOUNT	replace		X					
PIN, GROOVED, HEADLESS	replace		X					
SUPPORT, ANTENNA	replace		X					
	rebuild					X		
CABLE	replace		X					
CONNECTORS	replace		X					

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINT. FUNCTION**	**1ST ECH.**	**2ND ECH.**	**3RD ECH.**	**4TH ECH.**	**5TH ECH.**	**TOOLS REQUIRED**	**REMARKS**
AS-1057/ULT T2 (continued)								
SRT	repair				X			Available in std maint kits
SCREW	replace		X					(Nylon)
SCREWS	repair				X			Available in std maint kits
WASHERS	repair				X			Available in std maint kits
YOKE, ANTENNA MOUNT	replace		X					
HORN. WAVEGUIDE ASSEMBLY	repair				X			
	rebuild					X		
CONNECTOR	replace		X					
WASHER	replace				X			Available in std maint kits
HORN, WAVEGUIDE	replace		X					
REFLECTOR ASSEMBLY	repair				X			
	rebuild					X		
REFLECTOR, ANTENNA	replace		X					
	rebuild					X		
SUPPORT ASSEMBLY	repair				X			
	rebuild					X		
BRACKETS	rebuild					X		Fabricate
NUT	replace		X					Available in std maintenance kits
SCREW	replace				X			Available in std maintenance kits
SUPPORT	rebuild					x		Fabricate
WASHER	replace				X			Available in std maintenance kits
THUMB SCREW	replace		X					(Loose item)

Tools Required For Maintenance Functions (1)	1st ech. (2)	2nd ech. (3)	3rd ech. (4)	4th ech. (5)	5th ech. (6)	Tool Code (7)	Remarks (8)
AS 1057/ULT T2 (continued)							
MULTIMETER AN/URI 105		t				1	
MULTIMETER TS 352/U			t	t	t	2	
TOOL EQUIPMENT TE 41		t				3	
TOOL KIT TK 87/U			t	t	t	4	

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NG: None.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

ARTIFICIAL RESPIRATION

I. GENERAL

a. Rescue. In ease of electric shock, shut off the high voltage at once and ground the circuits. If the high voltage cannot be turned off without delay, free the victim from contact with the live conductor as promptly as possible. Avoid direct contact with either the live conductor or the victim's body. Use a dry board, dry clothing, or other nonconductor to free the victim. An axe with a dry wooden handle may be used to cut the high-voltage wire. Use extreme caution to avoid the resulting electric flash.

b. Symptoms.

(1) Breathing stops abruptly in electric shock if the current panes through the breathing center at the base of the brain. If the shock has not been too severe, the breath center recovers after a while and normal breathing Is resumed, provided that a sufficient supply of air has been furnished meanwhile by artificial respiration.

(2) The victim is usually very white or blue. The pulse is very weak or entirely absent and unconsciousness Is complete. Burns are usually present. The victim's body may become rigid or stiff In a very few minutes. This condition ia due to the action of electricity and Is not to be considered rigor mortis. Artificial respiration must still be given, as several such cases are reported to have recovered. The ordinary and general tests for death should never be accepted.

II. TREATMENT

Start artificial respiration Immediately. At the same time end for a medical officer, If assistance is available. Do not leave the victim unattended. Perform artificial respiration at the scene of the accident, unless the victim's or operator's life is endangered from such action. *In this case only*, remove the victim to another location, but no farther than is necessary for safety. If the new location is more than a few feet away, artificial respiration should be given while the victim is being moved. If the method of transportation prohibits the use of the Holger Nielson method, other methods of resuscitation may be used. Pressure may be exerted on the front of the victim's diaphragm. or the direct mouth-to-mouth method may be used. Artificial respiration, once started, must be continued without loss of rhythm. The standard technique (Holger Nielson) for executing the back-pressure, arm-lift method of artificial respiration is described here.

a. Position of Victim (A). Place the victim In the face down, prone position. Bend his elbows and place the hands one upon the other. Turn his face to one side, placing his cheek upon his hands.

b. Position of the Operator's Hands and Legs (B). Facing the head of the victim, kneel on either your right or left knee. Place this knee at the aide of the victim's head close to his forearm. Place your other foot near the victim's other elbow.

Note. Kneel on both your knees if you find it more comfortable, with one knee on each side of the victim's head.

Place your hands upon the flat of the victim's back in mash a way that the heels of your hands lie just below an imaginary line running between the victim's armpits With the tip of your thumbs just touching, spread the fingers downward and outward.

c. Compression Phase (C). Rock forward until your arms are approximately vertical and allow the weight of the upper part of your body to exert slow, steady, even pressure downward upon the hands This forces air out of the lungs. Your elbows should be kept straight and the pressure exerted almost directly downward on the back.

d. Position for Expansion Phase (D). Release the pressure, avoiding a final thrust, and commence to rock slowly backward. Place your bands upon the victim's arms just above his elbows.

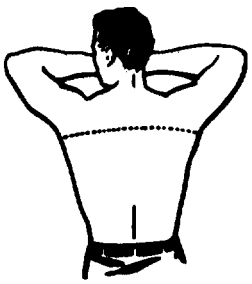
e. Expansion Phase (E). Draw the victim's arms up ward and toward you. Apply just enough lift to feel resistance and tension at the victim's shoulders Do not bend your elbows, and as you rock backward the victim's arms will be drawn toward you. Then drop the arms gently to the ground. This completes the full cycle. The arm lift expands the chest by pulling on the chest muscles, arching the back, and relieving the weight on the cheat

Note. The cycle should be repeated 12 times per minute at a steady, uniform rate. The compression and expansion phase should occupy about equal times; the release period being of minimum duration.

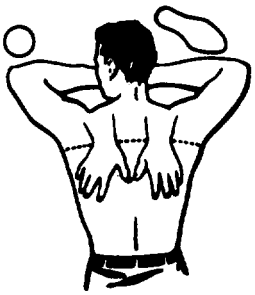
III. ADDITIONAL RELATED DIRECTION

It is all important that artificial respiration, when needed, be started quickly. There should be a slight Inclination of the body in such a way that fluid drains better from the respiratory passage. The bead of the victim should be extended, not flexed forward, and the chin should not sag lest obstruction of the respiratory passages occur. A cheek should be made to ascertain that the tongue or foreign objects are not obstructing the passages. These aspects can be cared for when placing the victim into position or shortly thereafter, between cycle. A smooth rhythm in performing artificial motion is desirable, but split-section timing is not essential. Shock should receive adequate attention, and the victim should remain recumbent after resuscitation until seen by a physician or until recovery seems assured.

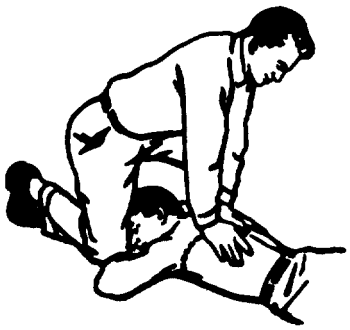
First Aid for Electric Shock



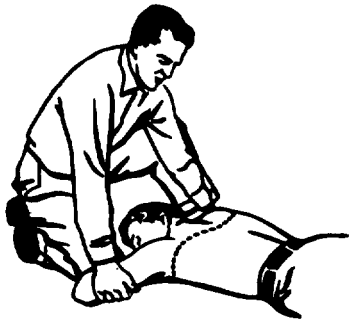
A—POSITION OF VICTIM



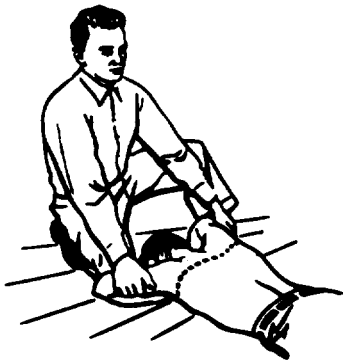
B—POSITION OF OPERATOR'S HANDS AND LEGS



C—COMPRESSION PHASE



D—POSITION FOR EXPANSION PHASE



E—EXPANSION PHASE

RA PD 196667

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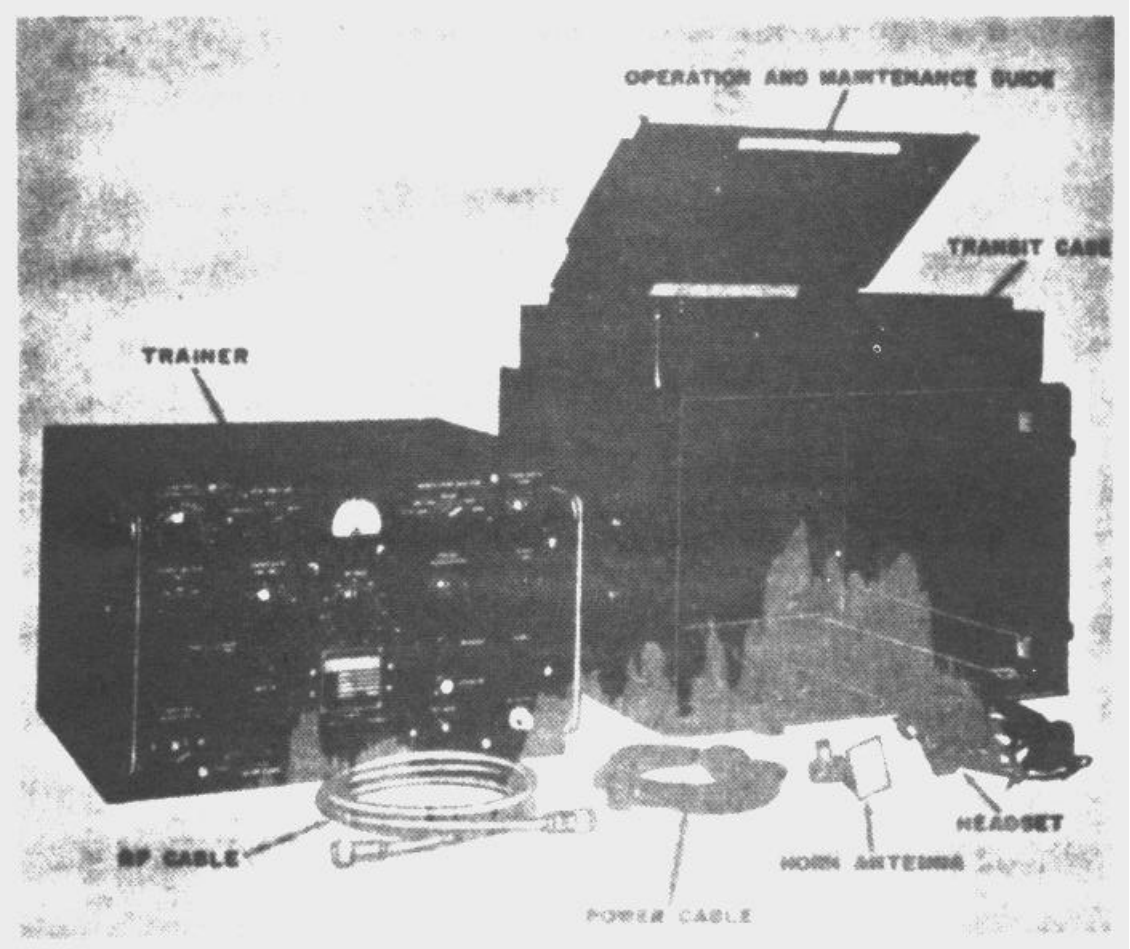


Figure 1-1. Radar Signal Interference Trainer (X-Band) Device 15X12

INTRODUCTION

This guide describes the theory of operation and the procedures necessary to install, operate, maintain and repair Radar Signal Interference Trainer (X-Band) Device 15X12. The trainer is a low power transmitter used to provide various types of interference signals necessary to instruct student radar operators in anti-jamming procedures. This guide also includes material to aid the instructor in utilizing the trainer in the training program.

SECTION I

GENERAL DESCRIPTION

1-1. TYPE OF DEVICE.

1-2. Radar Signal Interference Trainer (X-Band), Device 15X12, Is a low-power radar transmitter capable of generating and transmitting various types of interference signals in the 8500 to 9600 mc radar X-Band. (See figure 1-1.) Device 15X12 (hereafter called the trainer) is designed to operate in conjunction with an X-Band radar and enables an operator to practice anti-jamming techniques. The carrier signal which it transmits can be manually tuned to the frequency of the radar set and modulated in amplitude by a sine wave, square wave, pulse, noise, or modulation from an external source. The signal frequency is variable and can be set to any fixed frequency within the X-Band. A swept signal frequency within the X-Band is also available.

1-3. APPLICATION TO TRAINING.

1-4. The trainer operating controls are calibrated, and thus permit an instructor to re-create identical jamming signals for individual students. The effect of each type of jamming signal on the radar set can be observed, and anti-jamming techniques can thus be practiced and developed.

1-5. TRAINER SIGNAL CHARACTERISTICS.

1-6. The characteristics of the transmitted signal may be adjusted with front panel controls. These characteristics are cw (continuous wave) frequency, sweep rate, sweep sector, percent modulation, type of modulation, and pulse width.

1-7. PHYSICAL ASPECTS.

1-8. Radar Signal Interference Trainer (X-Band) Device 15X12 is manufactured by the Polarad Electronics Corporation, 43-20 34th Street, Long Island City 1, N. Y., under contract number N61339-29.

1-9. The trainer consists of a panel-chassis assembly and blower enclosed in a painted aluminum dust cover. It is stored and carried in a shock-resistant transit case with removable cover. Secured in the transit case cover are the Operation and Maintenance Guide and accessories. The accessories (figure 1-2) consist of a horn antenna, power cable, an rf cable and headset. The trainer, when enclosed in its olive-drab transit case, is carried by means of hinge-type handles located at each side of the case.

1-10. The trainer is made up of five sections: power supply, modulator (containing four modulating signal circuits and a sweeping circuit), rf section (containing a klystron oscillator, tube mount, horn antenna and wave guide), keyer, and audio amplifier.

1-11. The front panel (see figure 2-1)features eleven operating controls which can be used by the Instructor to select the type of interference signal desired. It also mounts receptacles for input power; operating, blower, and spare fuses; and external modulation, rf and audio output connectors.

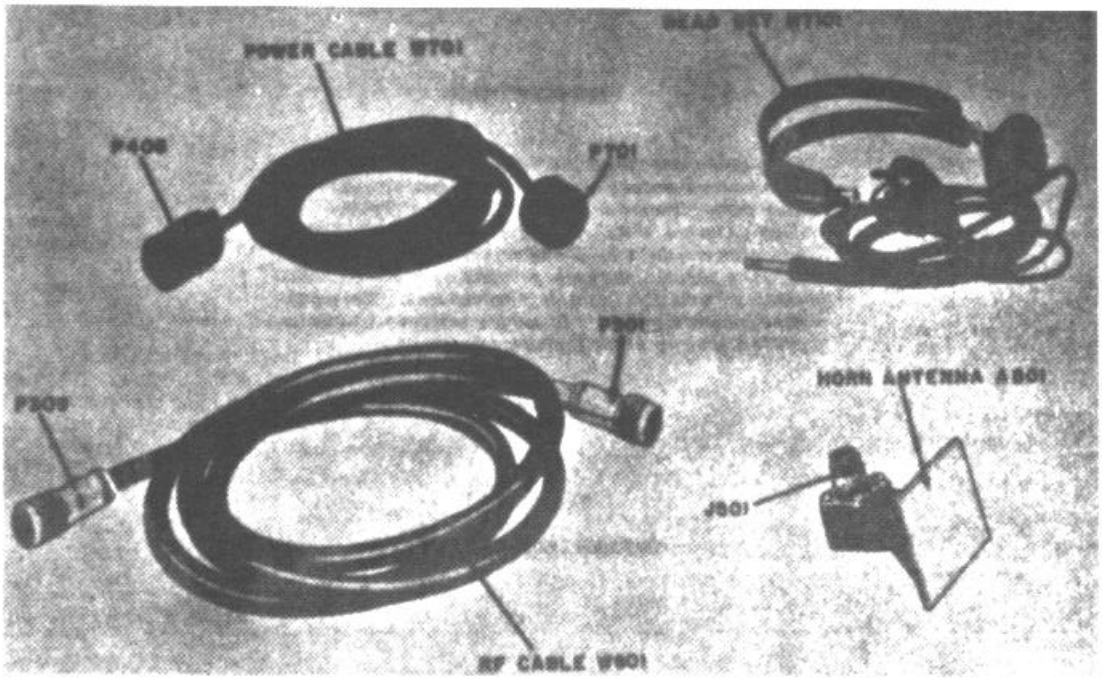


Figure 1-2. Trainer Accessories

1-12. EQUIPMENT SUPPLIED.

1-13. Refer to table 1-1 for the quantity, type and physical characteristics of the equipment supplied with the trainer.

1-14. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-15. The following equipment is required but not supplied with the trainer:

a. A power source of 105 to 1I0 volts, 50 to 440 cps, single phase, capable d delivering 500 watts, is required for operation d the trainer.

b. A radar set operating within the X-Band.

c. A target.

d. Repeater displays, as required.

TABLE 1-1. EQUIPMENT SUPPLIED

QTY	UNIT	NAVY DESIGNATION	OVERALL DIMENSIONS (Inches)	WEIGHT (Lbs)	NUMERICAL SERIES
1	Radar Signal Interference Trainer Device	15X12	19-23/32 by 13-25/32 by 19-23/32	95.0	101-801
	Accessories:				
1	Horn Antenna		2-1/2 by 2-3/8 by 2	0.25	800
1	Headset			0.5	100
1	RF Cable			1.0	700
1	Power Cable			2.0	600
1	Transit Case			35.0	

SECTION II

OPERATION

2-1. GENERAL.

2-2. The instructor should be thoroughly familiar with the trainer's capabilities, purpose and limitations. This section is written to enable both the student and instructor to become more proficient in operating the trainer and in obtaining the necessary signal characteristics required to practice anti-jamming techniques.

2-3. TRAINER CONTROLS, INDICATORS, AND CONNECTORS. (See figure 2-1.)

2-4. The front panel controls are listed in table 2-1 exactly as marked on the trainer. Each control function is clearly explained and referenced to its corresponding number as designated in figure 2-1.

2-5. The trainer indicators and connectors are listed in table 2-2 as marked on the trainer. The function of each front panel indicator and connector is clearly explained and referenced to its corresponding number as designated in figure 2-1.

TABLE 2-1. FRONT PANEL CONTROLS

CONTROL NO. (Seefigure2-1)	NAME OF CONTROL AND POSITIONS	FUNCTION
1	Power	Unit Power Control
	OFF	Power OFF position
	STAND BY	Energizes tube filaments
	TRANSMIT	Energizes transmitting circuits
3	MODULATION SELECTOR	Selects one of five modes of modulation
	CW-EXT MOD	CW alone or adds external modulation to carrier signal
	AMPLITUDE	Amplitude modulates the cw signal
	SQUARE	Adds square wave to cw
	PULSE	Adds pulse to cw
	NOISE	Adds noise to cw
4	FIXED-SWEPT FREQ	Selects fixed or swept frequency
6	AUDIO GAIN	Volume control for audio output
7	RF FREQ	Controls carrier frequency (8500 mc to 9600 mc) on scale marked 0 to 100; for tuning interference signal to student-operated radar set
9	MOD FREQ SEL	Selects the modulation frequencies for the type of modulation selected
	15 CPS - 15 KC	Connects VAR FREQ selector range of 15 cps to 15 kc
	50 KC	Fixes modulation frequency at 50 kc
	100 KC	Fixes modulation frequency at 100 kc
10	VAR FREQ (15 CPS-1SKC)	Selects modulator frequency on logarithmic scale from 15 cps to 15 kc
11	PERCENT MODULATION	Selects percent of amplitude modulation for AMPLITUDE and NOISE modulation only

TABLE 2-1. FRONT PANEL CONTROLS (cont)

CONTROL NO. (See figure 2-1)	NAME OF CONTROL AND POSITIONS	FUNCTION
12	PULSE WIDTH (USEC)	Selects pulse width of from one to five microseconds.
13	SWEEP SECTOR (MC)	Select 250 mc, 500 mc, or 1100 mc sweep sector.
14	SWEEP RATE (MC/SEC)	Selects rate of change of carrier frequency from 5 mc/sec to 16 mc/sec.

TABLE 2-2. FRONT PANEL INDICATORS AND CONNECTORS

CONTROL NO. (See figure 2-1)	INDICATOR OR CONNECTOR	FUNCTION
2	TRANSMIT	Light indicates power on to AU circuits.
5	STAND BY	Light indicates power on to filaments.
8	Power Monitor Meter	Indicates transmission of rf power.
15	105V-120V, 50-440 CPS, 1 ø	Input connector for power supply.
16	AUDIO	Phone Jack for headset.
17	RF OUTPUT	Connector used for attaching trainer to horn antenna.
18	EXT MOD	Input connector for external modulating signal.

2-6. PRECAUTIONS TO BE OBSERVED.

2-7. It the trainer signal is SWEPT FREQ operated with the SWEEP SECTOR selector in the 1100 position, care must be exercised to set the RF FREQ control to the midpoint (50)of the X-Band. Should the operator fail to observe this precaution, the trainer signal may overlap the limits of the X-Band, or the klystron oscillator may become inoperative at the limits of the sweep.

2-8. The power monitor meter indicates the average power of the signal being transmitted. During square wave transmission, the trainer is operated at halt the duty cycle of cw transmission. Therefore, during square wave transmission, the meter indicates half the average power of cw transmission. In pulse transmission, the duty cycle is a very small fraction of the transmission time. Therefore, in this mode of operation, the meter will read a minimal mount.

2-9. OPERATION OF THE EQUIPMENT. (See figure 2-1.)

CAUTION

Do not operate the trainer while it is still enclosed in its transit case. Operating the trainer in its case will result in frequency instability and equipment damage.

2-10. The sequence of operation for starting the trainer is as follows:

a. Turn the power switch (1) to TRANSMIT. The red TRANSMIT power lamp (3) ill glow.

b. Set the MODULATION SELECTOR switch to CW-EXT MOD; set the FIXED-SWEPT FREQ switch (4) to FIXED.

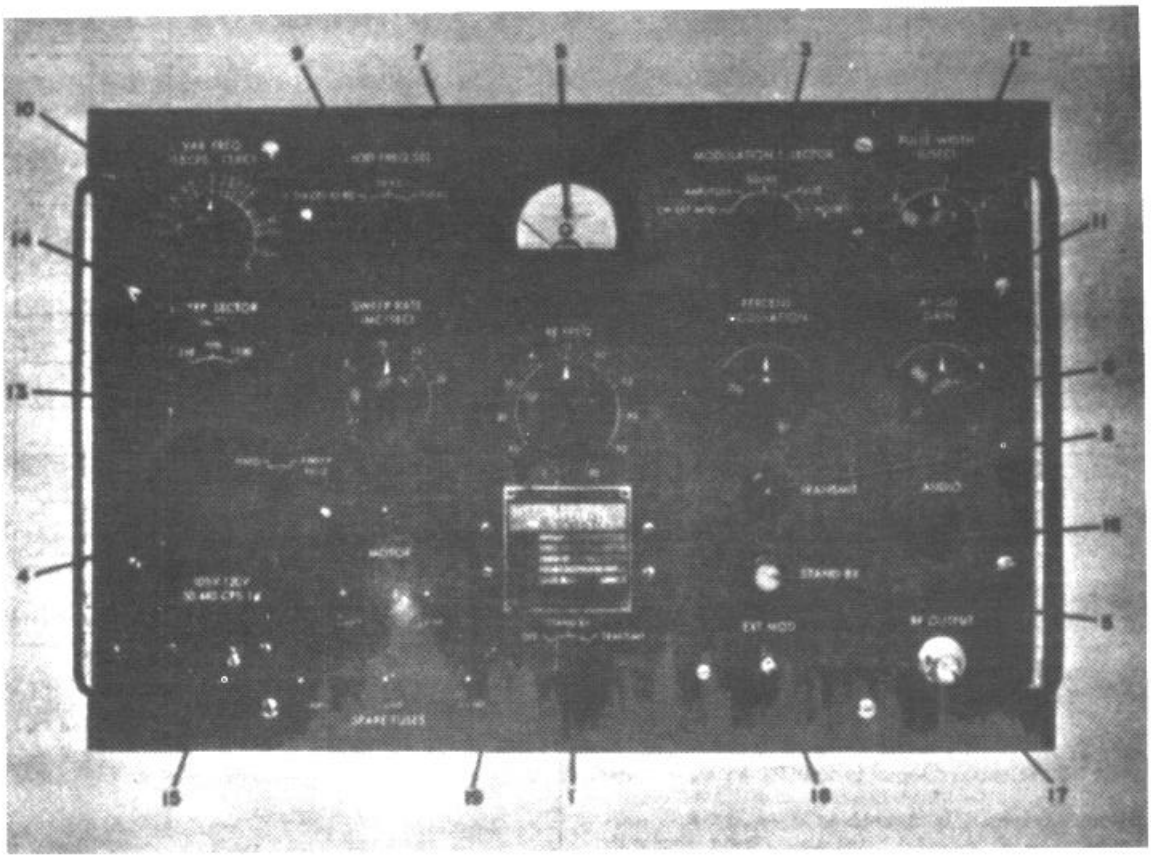


Figure 2-1. Radar Signal Interference Trainer, Front Panel

c. Allow a 20-minute warm-up period. The power monitor meter will indicate whether the trainer klystron oscillator is operating. Proper operation of the klystron oscillator will be indicated by readings of 0. 5 to 2. 5 ma (depending on the frequency) for CW-FIXED FREQ operation; 0.25 ma to 1 ma for AMPLITUDE, NOISE or SQUARE modulation; PULSE modulation indications are negligible (see paragraph 2-8). (Turning the power switch (1) to STAND BY will keep the tube filaments lighted and cause the amber STAND BY power lamp (5) to glow.)

2-11. With the trainer started and the power switch (1) in the TRANSMIT position, turn the AUDIO GAIN control (6) clockwise until a faint signal is audible in the headset. If no signal is heard, tune the trainer co the radar set frequency by turning the RF FREQ control (7) slowly, in steps of ten, from 0 to 100.

NOTE

The RF FREQ control must be turned very slowly and allowed to remain at each step for several minutes. Then, if no signal is heard in the headset, continue to the next step and repeat the tuning procedure until a signal is heard.

2-12. Continue tuning the trainer until a maximum audio output is heard in the headset. The cw output of the trainer is now at the same operating frequency as the radar set. Power monitor meter (8) will indicate whether the trainer is transmitting. Some radars, essentially those whose receivers do not employ preselection, may be sensitive to image frequency response. In this case, the radar may be jammed at a frequency which does not coincide with the trainer's transmitting frequency, although the radar acts as if it were being jammed by the trainer's fundamental transmitting frequency.

NOTE

Maintain the temperature within the trainer as constant as possible to stabilize the transmitting frequency. Extreme temperature changes will tend to change the operating frequency and require continuous readjustment of the RF FREQ control.

2-13. When the trainer and radar set transmission frequencies are synchronously tuned, modulation may be applied to the trainer carrier wave. Turn the MODULATION SELECTOR switch (3) to the desired type of modulation.

NOTE

The radar signal is heard in the headset only during cw operation of the trainer.

2-14. Make the following adjustments according to the type of signal selected:

a. For CW-EXT MOD operation, there are no additional adjustments.

b. For AMPLITUDE modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position is selected, set the VAR FREQ switch (10) to the desired frequency. Set the PERCENT MODULATION control (11) to the desired amount of modulation.

c. For SQUARE wave modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position is selected, set the VAR FREQ control (10) to the desired frequency.

d. For PULSE modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position Is selected, set the VAR FREQ control (10) to the desired frequency. Set the PULSE WIDTH control (12) to indicate the desired pulse width.

e. For NOISE modulation, set the PERCENT MODULATION control (11) to the desired amount of modulation.

2-15. If sweeping of the cw frequency is desired, turn FIXED-SWEPT FREQ switch (4) to SWEPT FREQ and set the SWEEP SECTOR switch (13) to the desired sector width (see paragraph 2-7). Set the SWEEP RATE control (14) to the desired rate of sweep.

2-16. INTERNAL ADJUSTMENTS.

2-17. Internal adjustments are not to be made by operating personnel. Only experienced maintenance personnel are authorized to make internal adjustments. (See paragraph 7-14 for instructions pertaining to these adjustments.)

2-18. PRE-OPERATING INSPECTION.

2-19. Before using the trainer, the instructor should ascertain that the equipment is in good working condition. Set up the trainer and radar set before giving the training session. Follow the instructions of paragraph 2-9 and note whether each trainer control has the proper result on the radar set in use. A good pre-instruction check of the trainer is a run-through of the demonstrations and results listed in table 4-1.

CAUTION

Make sure the blower is operating at all times and that all louvers are clear and unobstructed. Never operate the trainer while It is in the transit case.

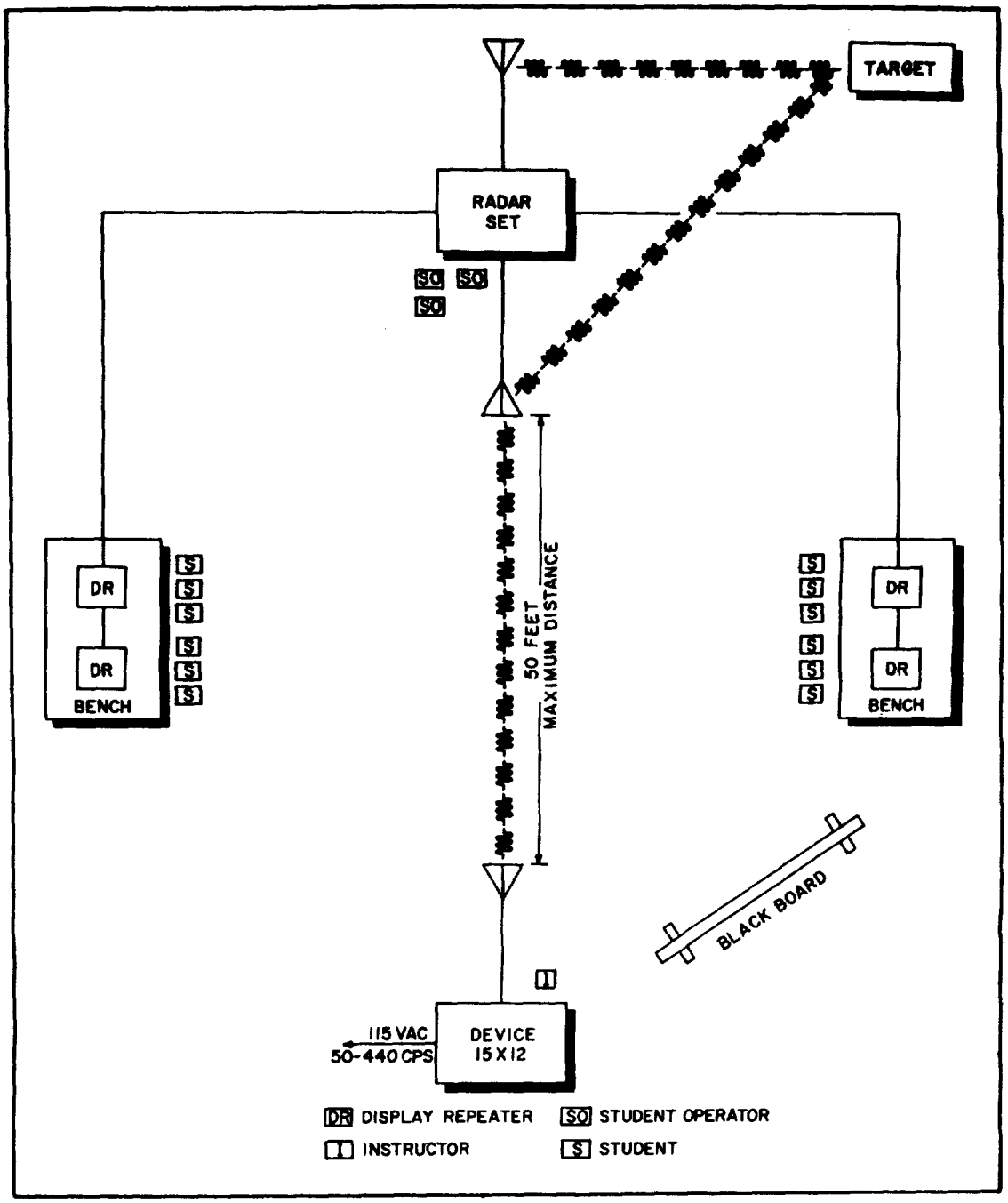


Figure 3-1. Block Diagram Showing Classroom Training, Typical Situation

SECTION III
THE DEVICE AS AN AID TO TRAINING

3-1. TRAINING SITUATIONS, GENERAL.

3-2. Students should have knowledge of the theory of jamming and anti-jamming, and be proficient in the use of the radar t being d. If operations difficulties arise in the use of the radar set, refer to its instruction manual The trainer is designed to be used in the classroom or in the field, within 50 feet of a radar set operating In the 8500 to 9600 mc (X-Band) frequency range.

NOTE

The procedures and situations outlined in Sections III and IV of this guide are suggested as possible methods of using the trainer In the training program. Depending on the particular training situation, the instructor should choose those procedures best suited to his purpose.

3-3. The calibrated front-panel controls allow the instructor to recreate identical interference signals at various agree to the training. He may repeat these signals for different students as they take their turn in operating the radar set. This feature of the trainer allows the instructor to evaluate each student's ability in recognizing and track-through interference signal whose characteristics are pre-determined. The instructor, for example, can set the trainer controls for an amplitude modulated signal, wept through the entire X-Band at a rate of 5 mc per second, and duplicate this signal at a later clam for each student, for the purpose of evaluating student's progress in absorbing the anti-jamming techniques. This signal or any combination of signal characteristics can be repeated an often as is necessary.

3-4. USE IN THE CLAS8ROOM.

3-5. The radar set and the trainer may be et up In the classroom (see figure 3-1). In this situation, the instructor operates the trainer and jams the radar set. He then re-tracks the target with the radar st and demonstrates anti-jamming techniques. This procedure can be repeated as often as is necessary for the available types of signal characteristics offered by the trainer. Section IV includes a list of demonstrations designed to teach the recognition of the various types of interference signals and the measures taken to "track-through (to switch the frequency of a radar et, or re-track the target, or take any other measures necessary to continue tracking the target). The instructor then continues to operate the trainer and transmits various interference signals while three student observe the Range, Elevation and Azimuth scopes and operate the radar set. The instructor aids the students in tracking-through the interference until the students have acquired the necessary skill. Repeater displays may be used to allow a greater number of students to observe the effect ofd jamming and the anti-jamming techniques. The instructor can tell the class what adjustment he is making on the trainer, such as changing the sweep sector, and the clan can then se the effects of various types of signals on individual displays, as well as the effectiveness of the anti-jamming procedures. Students can be rotated in their role of radar operators and display observers.

3-6. The use of repeater displays, however, sets an additional limitation to the student's absorption of the anti-jamming techniques, because the students using the repeater displays do not directly observe the radar set's operation when anti-jamming techniques are practiced. It is of utmost importance that each student obtain as much practice as possible with the radar set controls. It must be remembered that the effectiveness of classroom training is limited primarily by the Individual time each student is allowed to practice anti-Jamming techniques on the radar set proper, and the length of time devoted to this section of the radar training program.

3-7. U8E IN THE FIELD.

3-8. The trainer is adaptable for use in the field to demonstrate training situation similar to that actually encountered in a tactical situation. If field training Is preceded by classroom training with the trainer, a qualified student can operate the trainer while the instructor and the other students observe the operation of the radar set.

3-9. The training methods described under the classroom situation can be used in the field. Effectiveness will be limited by the lack of repeater displays and thus by the number of students who can observe the operation of the radar. It may also be limited by difficulty in communicating with the trainer operator. Training time in the field as compared to classroom training, will be limited also by the time consumed getting the equipment into position and setting it up. If the trainer is set up near a radar set, the instructor can move bet.-en the two sets to function both as the trainer operator and instructor in the use of the radar set.

3-10. In field use, the limitation of distance between the trainer operator (instructor) and the trainee (student) becomes more important because direct observation of the trainee's anti-jamming technique by the instructor may become more difficult. Where, in classroom training, they are in close proximity and each can observe the other's actions more closely, field conditions may prevent this close observation.

3-11. An effort should be made to set up the trainer so that the instructor can operate the trainer and still observe the students' actions in de-jamming the radar set. The instructor will thus be able to make on-the-spot corrections of the students' de-jamming procedure, if required. If this becomes difficult due to such conditions as fixed radar set and antenna location, auxiliary communication between the instructor and the trainee (such as a telephone line) may be required. In most radar installations, telephone communications are available between the radar set and the radar antenna.

3-12. When a situation exists where antenna propagation is difficult or the trainer has no effect, it should be first determined that the radar set is operating properly. Refer to the radar set instruction manual. If the radar set is operating properly, move the trainer antenna closer to the radar antenna. The location of the trainer antenna, in respect to the radar antenna, i: important to the effectiveness of the trainer. For effective jamming, the trainer antenna should be as close to the radar antenna as possible to provide for the maximum transfer of jamming signal energy. If the trainer has no effect, refer to paragraph 7-13, trouble-shooting.

3-13. In field use, where direct observation of the radar set and trainer frequencies is not possible due to physical limitations, and where use of the audio output of the trainer for synchronization of these frequencies is not desired, the frequencies may be synchronized as follows:

a. Set the radar set into operation.
b. Set the trainer into operation.
c. Observe the scan of the radar antenna.
d. Vary the frequency of the trainer set until the radar antenna ceases to scan in a definite pattern and begins to hunt and waver.

3-14. PLACEMENT OF THE TRAINER IN THE RADAR TRAINING PROGRAM.

3-15. The trainer is designed for use in a radar operator training program or in organizational anti-jamming technique drills. If used in the training program, the anti-jamming instruction should be given in the latter portion of the course. The trainee is then familiar with the radar set, its function, and operating controls. If used to train experienced operators, the trainer may be used at any time except during operational tactics.

3-16. In organizational use, the trainer proves effective in sharpening individual operator and radar crew teamwork. In anti-jamming operations, the Range, Azimuth and Elevation scope operators must work together to read through the jamming to track the target. Since the trainer is an rf device, its operation is entirely independent of the radar set proper and it maybe turned off at a moment's notice. No connections between the trainer and the radar set are necessary. This feature makes the trainer ideal for training radar operators in anti-jamming techniques at the organizational level, where with very short notice, the radar may have to be used for tracking an unidentified or enemy target. The trainer easily lends itself to operation in the tactical situations listed in table 3-1.

3-17. LENGTH OF TRAINING TIME.

3-18. The length of time required to train an operator in anti-jamming techniques will vary among individual trainees. The length of training time is relative to the individual trainee's aptitude and his ability to absorb the anti-jamming technique On the average, three weeks of training, consisting of instruction, demonstration, individual practice and class participation, should be sufficient to train an operator or student in anti-jamming techniques. On the organizational level, anti-jamming techniques should be practiced at regular intervals. A program should be set up to integrate anti-jamming training on a continual basis so that radar operators do not lose their skill in tracking jammed targets.

TABLE 3-1. TACTICAL SITUATIONS

*SITUATION	DESCRIPTION	TRAINER OPERATION
a	Operational	No
b	Standby Operation	Yes
c	Training Operation	Yes
d	Maintenance Operation	Yes

*Situation a (operational). Training not recommended while actually tracking unidentified targets.
*Situation b (standby operation). Training recommended while radar crews are standing by, preparatory to drills, training, or operation.
*Situation c (training operation). Training highly recommended during this period.
*Situation d (maintenance operation). Training recommended to establish recognition of a deficient radar set symptom. A defective radar set may also cause loss of a target on the display.

SECTION IV
PROBLEMS, EXPERIMENTS, DEMONSTRATIONS

4-1. GENERAL.

4-2. To increase the educational value of the trainer, the instructor should precede each training session with a preview of the material to be presented and, after each training session, he should review the instructional material presented. This may include an outline of the instructional material, explanation of new terms or expressions and phenomena demonstrated, a question and answer period, and criticism of the student's performance in practicing anti-jamming techniques.

4-3. Table 4-1 lists several problems and means of demonstrating them, to familiarize students with aspects of jamming and anti-jamming measures.

4-4. EQUIPMENT PREPARATION.

4-5. Prior to conducting the demonstrations listed in table 4-1, the instructor should, preferably with the aid of his students, connect repeater displays to the radar set. The radar set and trainer should then be put into operation and a quick run-through made of the demonstrations listed in table 4-1 to determine that both are in good operating condition. This will assure that proper results are obtained for each demonstration and that the lecture can continue uninterrupted.

4-6. After the equipment has been checked and prepared, the Instructor may demonstrate to the students the effect various jamming signals have on the radar scope's target display. Table 4-1 suggests a number of demonstrations which can be performed to illustrate the various types of jamming provided by the trainer. Table 4-1 also lists the procedure used in setting up the trainer for each demonstration, and the expected result on the radar scope target display.

These demonstrations should continue until the students can distinguish between normal and jammed radar target displays.

TABLE 4-1. SUGGESTED PROCEDURES FOR TRAINING DEMONSTRATIONS

DEMONSTRA-TION NUMBER	TO DEMONSTRATE	PROCEDURE	RESULTS
1	Effect of cw inter-ference.	With MODULATION SELECTOR switch at CW-EXT MOD, tune trainer to the radar set frequency.	The radar transmitter pulse, noise (grass), and the target echo will disappear if the strength of the interference signal is strong enough.
2	Effect of tuned and untuned cw signals.	Listening in on the headset, vary the trainer cw in and out of tune with student radar set by means of the RF FREQ control.	Interference appears only at synchronous frequencies. (On some radars, interference may appear at the image frequency).
3	Tracking through by lowering receiver sensitivity and gain of radar set.	Trainer tracks radar set. Student lowers receiver gain. signal, target echo may appear through interference.	Depending on the relative power of the target echo and trainer
4	Tracking through interference by varying frequency of radar set.	Trainer tracks radar set with fixed frequency cw. Student varies frequency of radar set, frequency.	Interference appears at syn-chronous frequency and dis-appears at any non-synchronous
5	CW interference In a swept frequency.	Trainer operates at swept frequency cw; radar set at fixed frequency.	Student observes periodic interference on radar set. Target echo may be lost.

TABLE 4-1. SUGGESTED PROCEDURES FOR TRAINING DEMONSTRATION (cont)

DEMONSTRATION NUMBER	TO DEMONSTRATE	PROCEDURE	RESULTS
6	Effect of sweep sector.	Adjust SWEEP SECTOR switch to 1100, 500, and 250 me.	Trainer swept through full range will jam radar. At 500 mc or 250 mc sectors, swept cw may or may not jam radar, depending on the setting of RF FREQ control.
7	Effect of sweep rate.	Vary the SWEEP RATE control of the trainer.	Interference signal sweep rate will vary.
8	Interference by amplitude modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to AMPLITUDE.	The radar display portrays many superimposed sine waves, partially or completely obscuring target echo. (See figure 4-1(C, D)). At very high trainer modulation frequencies, the target echo may be completely lost.
9	Interference by square wave modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to SQUARE.	The radar display portrays many superimposed square waves, partially or completely obscuring target echo. (See figure 4-1(E, H)). Target echo may be completely lost.
10	Interference by pulse modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to PULSE.	The radar display portrays pulses partially or completely obscuring target echo. (See figure 4-1(G, 11). Target echo may be completely lost.
11	Interference by noise modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to NOISE.	The radar display portrays "grass", partially or completely obscuring target echo. (See figure 4-1()), Target echo may be completely lost.

4-7. DRILLS AND PROBLEMS.

4-8. As described in Section II, the trainer can emit fixed or swept frequency jamming signals. The setting of the trainer controls for these modes of operation are shown in tables 4-2 and 4-3, respectively. Each of the jamming-signal characteristics listed in these tables can be varied in sweep rate, sweep sector, percent modulation, etc, by setting the trainer controls to the settings indicated. It a control does not apply in obtaining certain signal characteristics, the table will indicate this by N/A (not applicable). Some characteristics can be varied to a great extent (especially those whose controls can be set to any and all positions) while others, such as fixed frequency cw unmodulated signals, or swept frequency signals (pulse-modulated at 50 or 100 kc), have relatively fixed characteristics.

4-9. Each of these conditions can be made increasingly more complex by varying the controls which 12 can be set to any and all positions. They can be varied from their extreme counterclockwise to their extreme clockwise positions, or any combination thereof, to achieve the required amount of complexity. After a trainer signal characteristic has been chosen, and the radar set jammed, the students must re-track the target, using one of the remedies listed in tables 4-2 and 4-3.

4-10. After the students have re-tracked the target, the instructor can make the trainer signal even more complex by increasing the sweep rate, or the modulation frequency, or the percentage of modulation, or any combination thereof, to jam the radar set once more. The students must then re-track the target. These drills should be made more and more complex for each type of signal characteristic, using the procedure discussed above. The drills should be continued until the students have become proficient in re-tracking the radar target.

TABLE 4-2 DRILLS AND PROCEDURES FOR FIXED FREQUENCY OPERATION

Jamming Signal Characteristics	*Trainer Control Settings					Remedies and Remarks
	MODULATOR SELECTOR	MOD FREQ SEL	VAR FREQ	PERCENT MODULATION	Effect	
1. Fixed frequency cw unmodulated signal	CW-EXT MOD	N/A	N/A	N/A	See figure 4-1(B)	Any or all of the following steps are to be taken in de-jamming a jammed radar set a. Re-track target; b. Change radar frequency; c. Reduce radar receiver sensitivity. If any difficulty is encountered in the above steps, refer to the Instruction Manual pertaining to the radar set in use. *NOTES 1. Set the FIXED-SWEPT FREQ switch to FIXED, 2. The PULSE WIDTH (USEC) control is only applicable to steps 8 9, and 10; 3. The control settings can be set to simulate any desired signal characteristic or can be changed indiscriminately to produce various types of jamming signals; 4. N/A denotes not applicable.
2. Fixed frequency signal amplitude modulated at 15 cps - 15 kc	AMPLITUDE	15 CPS-15KC	Set to any and all positions	Set to any and all positions	See figure 4-1(C, F)	
3. Fixed frequency signal amplitude modulated at 50 kc	AMPLITUDE	50 KC	N/A	Set to any and all positions	See figure 4-1(D)	
4. Fixed frequency signal amplitude modulated at 100 kc	AMPLITUDE	100 KC	N/A	Set to any and all positions	Similar to figure 4-1(D)	
5. Fixed frequency signal square wave modulated at 15 cps - 15 kc	SQUARE	15 CPS- 15 KC	Set to any and all positions	N/A	See figure 4-1(E)	
6. Fixed frequency signal square wave modulated at 50 kc square wave	SQUARE	50 KC	N/A	N/A	See figure 4-1(H)	
7. Fixed frequency signal square wave modulated at 100 kc	SQUARE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
8. Fixed frequency signal pulse modulated at 15 cps-15 kc	PULSE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1(G)	
9. Fixed frequency signal pulse modulated at 50kc	PULSE	50 KC	N/A	N/A	See figure 4-1 (H)	
10. Fixed frequency signal pulse modulated at 100kc	PULSE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
11. Fixed frequency signal noise modulated	NOISE	N/A	N/A	Set to any and all positions	See figure 4-1(I)	

TABLE 4-3. DRILLS AND PROCEDURES FOR SWEPT FREQUENCY OPERATION

Jamming Signal Characteristics	*Trainer Control Settings					Remedies and Remarks
	MODULATION SELECTOR	MOD FREQ SEL	PERCENT VAR FREQ	MODULATION	† Effect	
1. Swept frequency cw unmodulated signal	CW-EXT MOD	N/A	N/A	N/A	See figure 4-1(B)	Any or all of the following remedies re to be taken in de-jamming- a jammed radar set: a. Re-track target; b. Change radar frequency; c. Reduce radar sensitivity. If any difficulty is encountered in the above steps, refer to the Instruction Manual pertaining to the radar set in use. *NOTES 1. Set the FIXED-SWEPT FREQ switch to SWEPT FREQ; 2. Set SWEEP SECTOR (MC) switch to 250, 500, or 1100, as desired, and at SWEEP RATE (MC/SEC) control to any and all positions; 3. The PULSE WIDTH (USEC) control is only applicable to steps 8,9,and 10. 4. N/A denotes not applicable. † See note 3 of figure 4-1.
2. Swept frequency signal amplitude modulated at 15 cps-15 kc	AMPLITUDE	15 CPS-15 KC	Set to any and all positions	Set to any and all positions	See figure 4-1(C, F)	
3. Swept frequency signal amplitude modulated at 50 kc	AMPLITUDE	50 KC	N/A	Set to any and all positions	See figure 4-1(D)	
4. Swept frequency signal amplitude modulated Lt 100 kc	AMPLITUDE	100 KC	N/A	Set to any and all positions	Similar to figure 4-1(D)	
5. Swept frequency signal-square wave modulated at 15 cps-15 kc	SQUARE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1 (E)	
6. Swept frequency signal square wave modulated at 50 kc	SQUARE	50 KC	N/A	N/A	See figure 4-I(H)	
7. Swept frequency signal square wave modulated at 100 kc	SQUARE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
8. Swept frequency signal pulse modulated at 15 cps-15 kc	PULSE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1(G)	
9. Swept frequency signal pulse modulated at 50kc	PULSE	50 KC	N/A	N/A	See figure 4-1(4)	
10. Swept frequency signal pulse modulated at 100kc	PULSE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
11. Swept frequency signal noise modulated	NOISE	N/A	N/A	Set to any and all positions	See figure 4-1(I)	

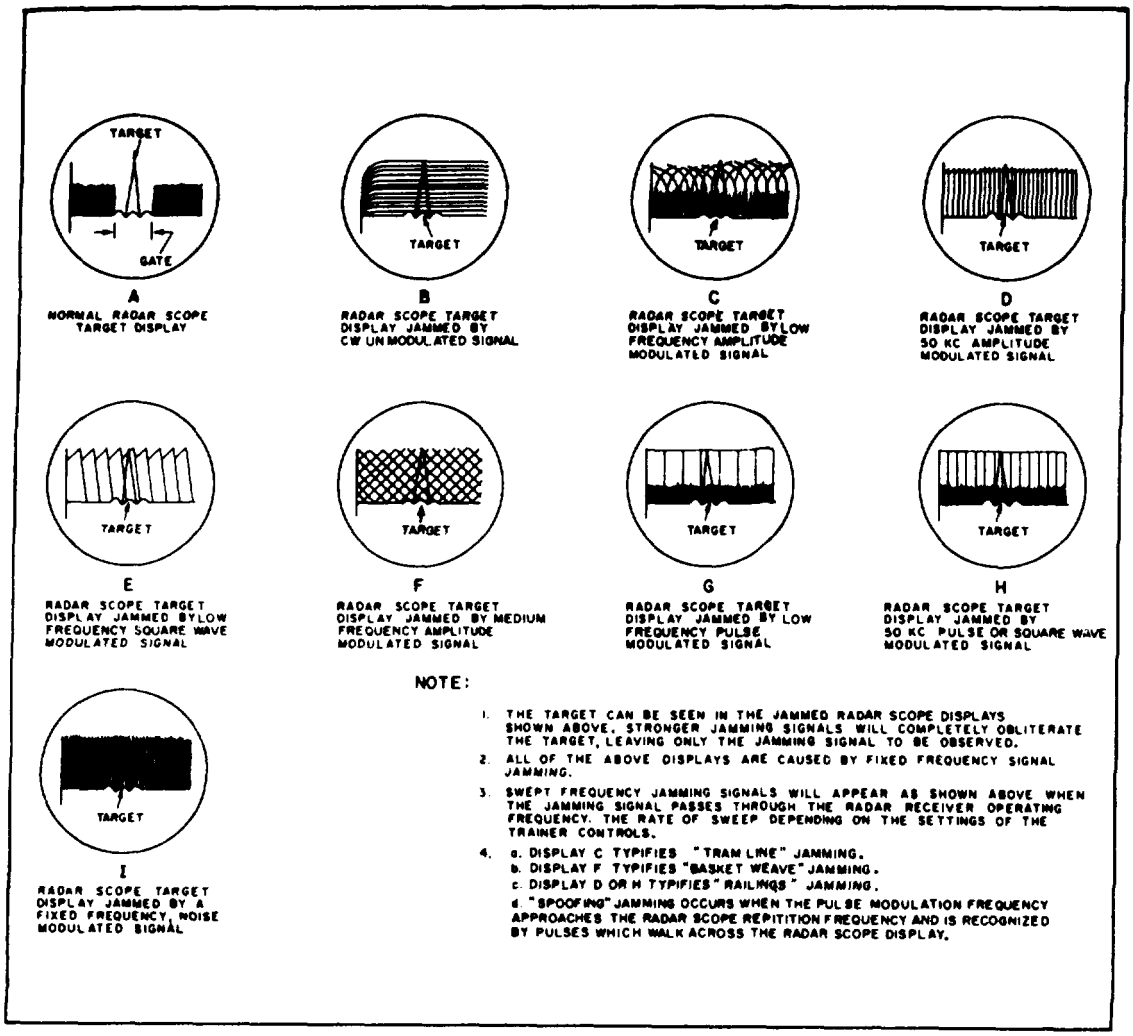


Figure 4-1. Normal and Jammed Radar Scope Target Displays

4-11. Figure 4-1 illustrates a normal radar target signal, and the effects of various jamming signal characteristics on a signal of this type. The displays shown in this figure are for fixed frequency jamming. Swept frequency jamming will look the same, as the swept signal frequency passes through the radar receiver frequency. The rate of sweep will depend on the setting of the trainer SWEEP RATE and SWEEP SECTOR control settings.

4-12. POST-DEMONSTRATION ACTIVITIES.

4-13. It is important for the instructor to note that, although the student may observe the jamming displays on the repeaters, each student must receive instructions at the radar set proper. Doing so, will give the student a better understanding of tracking through techniques and a better "feel" for the radar set controls as used for de-jamming purposes. Remember that repeater displays reduce the effectiveness of communications between the student and instructor, as well as the student's visibility of the radar set controls during operation.

4-14. It will be evident that high-frequency noise modulation has the greatest effect on the radar signal. Low frequency modulation rates are less effective. As the instructor follows the steps outlined in these tables, the drills should be made more and more complex. At each step, the instructor can vary the controls which change the trainer's signal characteristics. These controls may be set to any and all

settings. After the instructor has become familiar with the trainer and the particular radar set in use, he will come to know which position of the trainer controls are most effective.

4-15. Students should take notes during the instructor's lecture and demonstration. These notes should include the procedures used in each demonstration and their expected results. After class, the student can study these notes and thus increase his proficiency in anti-jamming techniques. This will also increase the value of each succeeding lesson and enable the student to derive as much benefit from the lectures as possible in the least amount of time.

4-16. In addition to the question and answer period referred to in paragraph 4-1, the instructor should give tests to his students in the art of tracking through, under jammed signal conditions. These tests should be based on classroom and field lectures and demonstrations. Tests should be designed to indicate the students' progress and ability to absorb the instructional material. A number of tests should be given from time to time so that the students progress may be observed and weaknesses corrected before the course ends. See paragraph 8-1 for typical test forms.

SECTION V

INSTALLATION AND ADJUSTMENTS

5-1. UNPACKING THE TRAINER.

5-2. In unpacking the Radar Signal Interference Trainer (X-Band) Device 15X12, try to preserve the original packing crate so that it may be re-used for repacking the equipment, if required. Observe the following pre-cautions:

a. Remove nails with a nail puller only.

b. Remove screws with a screwdriver only.

c. Do not hammer or pound on the packing crate.

d. Keep all levers on crowbars away from the interior of the crate.

5-3. INSTALLATION. (See figure 5-1.)

WARNING

High voltages, dangerous to life, are employed in the operation of this equipment. Observe all safety precautions. Do not operate the equipment unless it is completely enclosed in its dust cover.

5-4. The trainer is completely factory-adjusted and tested, and is ready for use when shipped.

5-5. There are no external adjustments to the trainer other than the operating controls described in Section II. Internal adjustments should be made only by qualified maintenance personnel, as described in paragraph 7-14.

5-6. To install the trainer for use, refer to the front panel and cabling diagrams, figures 2-1 and 10-1 respectively. Observe the following procedure:

a. Attach the female plug of the twenty-five foot input power cable W701 to the power input jack (15). Insert the male plug into a power source having an output of 105 to 120 volts, 50 to 440 cps, single phase.

b. Plug headset HT101 into the AUDIO jack (16).

c. By means of rf cable W601, attach the horn antenna to the RF OUTPUT connector (17).

d. Position the trainer so that straight line propagation from the trainer antenna to the student-operated radar set antenna, will be unobstructed. Place the trainer antenna in close proximity to the radar antenna.

e. Aim the trainer antenna in the direction of the student-operated radar set antenna. Proper placement of the trainer antenna is very important in effective jamming of the radar set. (Refer to paragraph 3-12.)

f. If external modulation is being used, plug the external modulation input into the EXT MOD jack (18).

INSTALLATION STANDARDS

DATA SHEET

Device Name: Radar Signal Interference Trainer (X-Band)

Device Number: 15X12

Classification: Unclassified

USE: Training in radar tracking under jammed signal conditions.

HOW TO OBTAIN: Address all requests to the Department of the Navy
U. S. Naval Training Device Center
Post Washington, New York

NECESSARY PROVISIONS

POWER: 105 to 120 volts ac, 50 to 440 cps, single phase, 500 watts.

SPACE REQUIREMENT: Minimum of 6 by 7 feet.

SPECIAL REQUIREMENTS: Illumination: Small light enabling operator to discern markings on front panel during possible night field demonstration-.

MINIMUM OPENING TO PASS THROUGH: Before uncrating, will pass through an opening of 16 by 24 inches

STUDENT CAPACITY: Limited to 3 students per radar set, plus 3 students at each display repeater used.

OPERATING PERSONNEL: One Instructor.

MAINTENANCE PERSONNEL: One.

WEIGHTS AND DIMENSIONS OF COMPONENTS

ITEM UNCRATED	SIZE (inches) CRATED	SIZE (inches) WEIGHT	NET WEIGHT	CRATED
1. Device 15X12 Total-1 case	19-23/32 by 13-25/32 by 19-23/32	23-1/2 by 15-3/4 by 22	95 lbs	140 lbs

Figure 5-1. Data Sheet, Installation Standards (sheet 1 of 2)

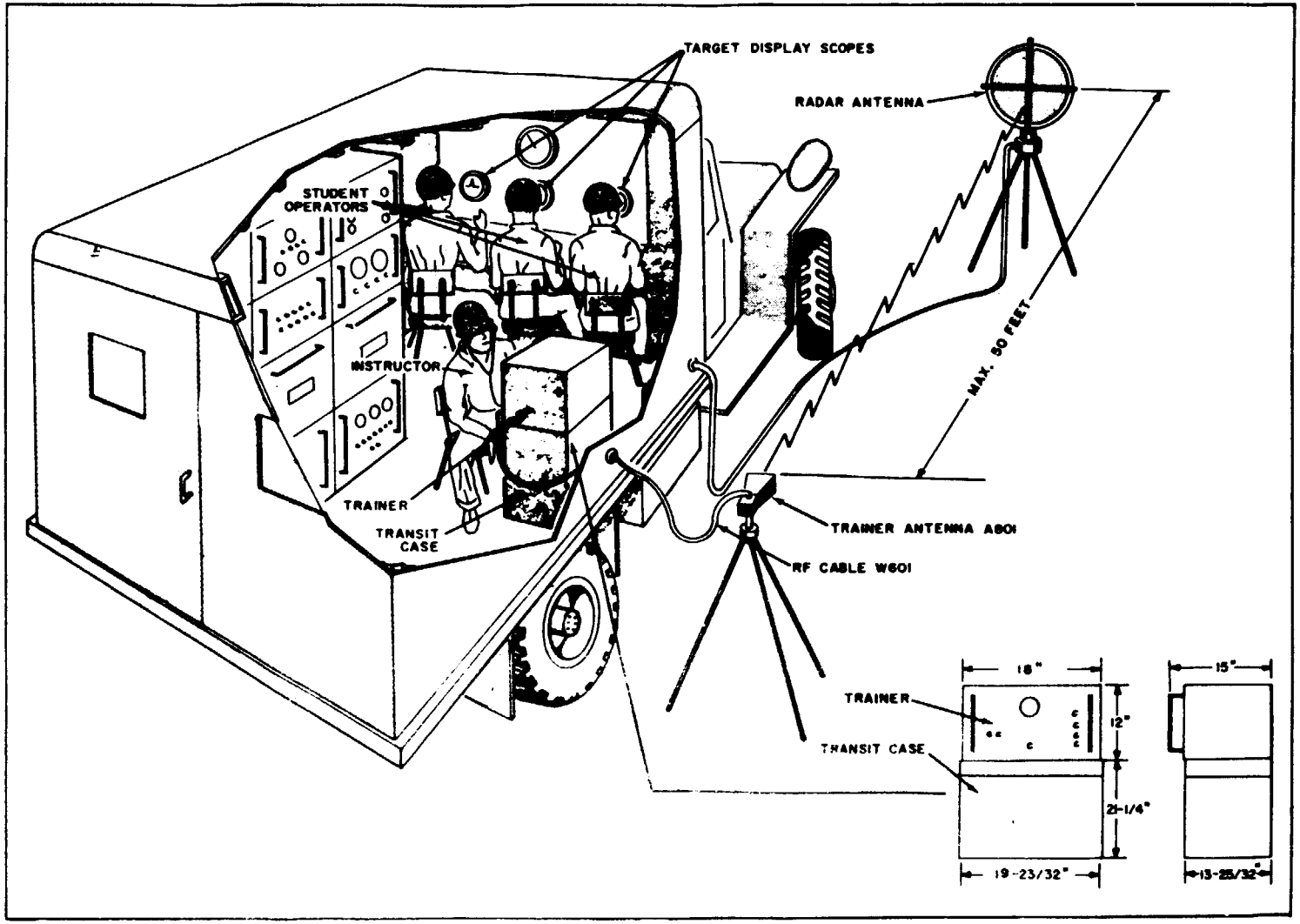


Figure 5-1. Typical Field Installation Standards (sheet 2 of 2)

SECTION VI

THEORY OF DEVICE OPERATION

6-1. FUNCTIONAL OPERATION OF THE TRAINER

(See figure 10-18.)

6-2. The trainer is a self-contained unit consisting of five major sections: an rf section, a modulator, a keyer, an audio amplifier, and a power supply. A description of each section follows:

a. The rf section consists of an internal cavity reflex klystron tube which generates the carrier wave (tunable through the X-Band), a waveguide which divides the rf output to the antenna and the audio amplifier, a synchronous diode, a power monitor meter, and a horn antenna.

b. The modulator section includes a sweeping circuit and four generators: sine-wave, square-wave, pulse, and noise. The signal from one of these generators or from an external modulation source is added to the carrier wave in the keyer when amplitude modulation is desired. The sweeping circuit supplies a triangular waveform for the klystron reflector (repeller) and tuner grid, to effect a swept frequency.

c. The keyer section adjusts the voltage of the modulator outputs to the proper level for the klystron. It consists of a keyer tube, summing amplifier, and modulation selector switch, in addition to its associated circuitry. The keyer tube operates only during square-wave or pulse modulation.

d. The audio amplifier amplifies the trainer and radar set signals to a level which can be heard in the headset. Maximum audio signal is heard when the trainer and radar set frequencies are synchronously tuned.

e. The power supply section supplies all circuits with a 6.3-volt filament voltage, and +300-volt dc and -300-volt dc regulated voltages from a 105-120volt ac, 50-440 cps source.

6-3. CIRCUIT ANALYSIS.

(See figure 10-19.)

6-4. RF SECTION.

6-5. The trainer employs a type 2K45 thermally tuned internal cavity reflex klystron as an oscillator. The klystron tube generates a cw signal in the frequency range 8500 mc to 9600 mc, which can be swept in sweep sector widths of 250, 500 or 1100 mc, if desired. This signal can be amplitude-modulated and tuned to the radar set radio frequency. (When using the 1100 mc sweep, the RF FREQ control must be set at its midpoint so that the frequency limits of the X-Band are not exceeded. Should these limits be exceeded, the 2K45 klystron oscillator may become inoperative at the limits of the band.) Tuning and sweeping is achieved by the "warping" of the cavity grids, induced by the heating effect of a current passing through a section of the klystron connected as a triode.

6-6. The mechanical configuration of the klystron with its tuner device is given in figure 6-1.

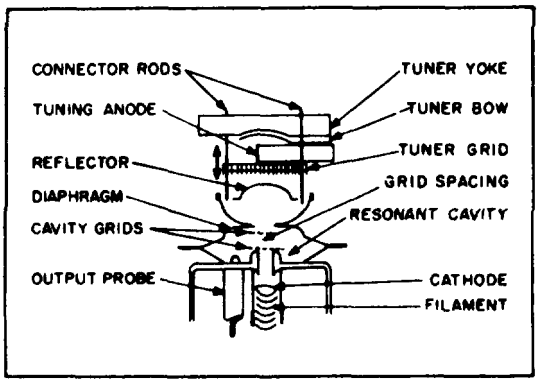


Figure 6-1. Reflex Klystron, Simplified Sectional View

a. The klystron is tuned by means of the tuning anode. Thermal expansion of the anode causes the tuner bow to move laterally, causing longitudinal movement of the tuner yoke, connector rods, diaphragm and cavity grids.

b. The klystron Is swept by a back-and-forth motion of the tuning anode, caused by a triangular wave in the tuner grid. The sweep rate of the tube is limited by the rate the anode can be made to expand and contract.

c. The magnitude of the warping current is controlled by the tuner grid, connected to the sweeper and rf tuning circuits, Warping of the cavity grids will vary the effective capacitance of the resonating circuit, and thus effect a change in frequency. When the klystron operates at a modulated and/or swept frequency, the modulator waveform voltage is applied to the reflector, and the triangular sweeper voltage is applied to both the cavity and tuner grids.

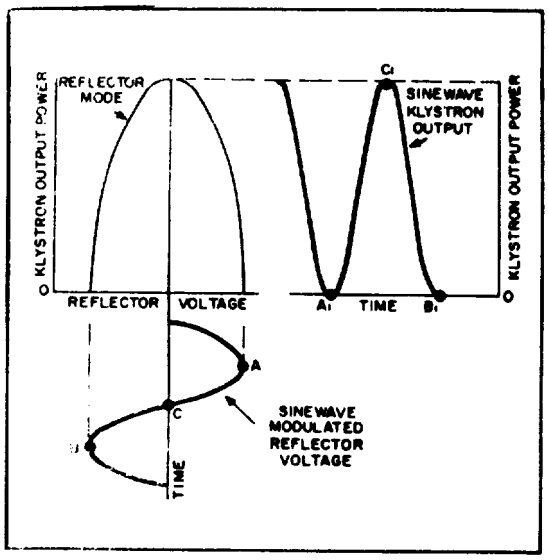


Figure 6-2. Reflector Mode, Sine-wave Modulation

6-7. To modulate the trainer carrier signal, the output from the sine wave, square wave, noise, or pulse generators (or an external source) is added to the reflector. The output of the klystron will vary with reflector voltage, and a modulating signal in the reflector voltage will produce modulation in the amplitude of the cw.

a. Figure 6-2 illustrates sine wave modulation of the klystron reflector mode. At instant A, reflector voltage is at a maximum within the reflector mode .and klystron power output A_1 is zero. At instant B, reflector voltage is at a minimum within the reflector mode and klystron power output B_1 is zero. At instant C, reflector voltage is in the center of the reflector mode and klystron power output is at a maximum. For every sine wave cycle which modulates the reflector mode, two cycles appear at the klystron output For this reason, the sine wave generator is designed to oscillate at one-half the MOD FREQ SEL front panel frequency designation, when the MODULATION SELECTOR is in the AMPLITUDE position.

b. Figure 6-3 illustrates pulse and square wave modulation of the klystron reflector mode. At instant A, reflector voltage it outside of the reflector mode and klystron power output A_1 is zero. At instant B, reflector voltage is in the center of the mode and klystron power is at the maximum. Reflector modulation voltage is determined by the modulator and keyer.

c. The modulated rf output of the klystron is adapted to a waveguide and sent to the antenna. The transmitter-receiver antenna is a pick-up horn in the shape of a rectangular, truncated pyramid, Sealed to exclude dirt and moisture. It is coupled to the waveguide by means of coaxial rf cable W601.

6-8. Mixer CR501 is a 1N23 crystal which receive the radar set signal input and a portion of the klystron output from a loop inserted in the waveguide. This crystal is sensitive to synchronous frequencies. When the klystron output frequency is tuned to the input radar set frequency, maximum current passes through the audio amplifier, in turn producing maximum sound in the headset. Maximum synchronization thus produces maximum sound. Where the radar set signal is very strong, it may be heard in the headset when the trainer is de-tuned; however, maximum audio signal will still occur at the synchronous frequencies.

6-9. MODULATOR SECTION.

6-10. INTRODUCTION. The sine wave generator (see figure 6-4) it a Wien-bridge type oscillator with selectable bridge circuit. The selectable bridge consists of resistance-capacitance networks, a thermistor RT237, a frequency selector switch S201, and a variable frequency control RS30A-R130B. The oscillator consists primarily of tubes V206 and V307. Fundamentally, the circuit is a feedback amplifier with positive feedback for a frequency selected by the Wien-bridge network. It is an oscillator by virtue of the positive feedback loop. The following paragraph describe the oscillator and Wien-bridge circuits.

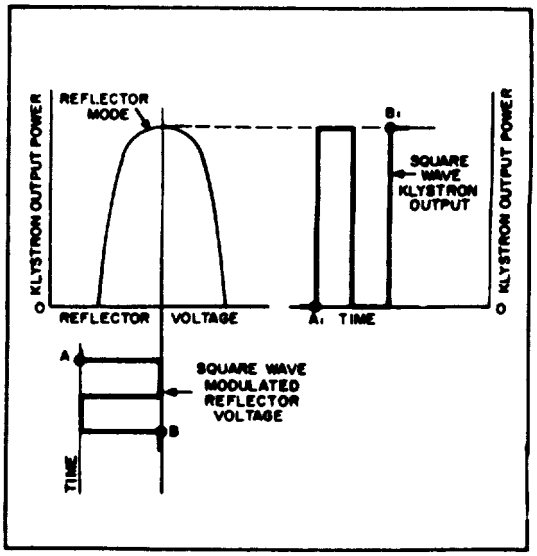


Figure 6-3. Reflector Mode, Pulse and Square-wave Modulation

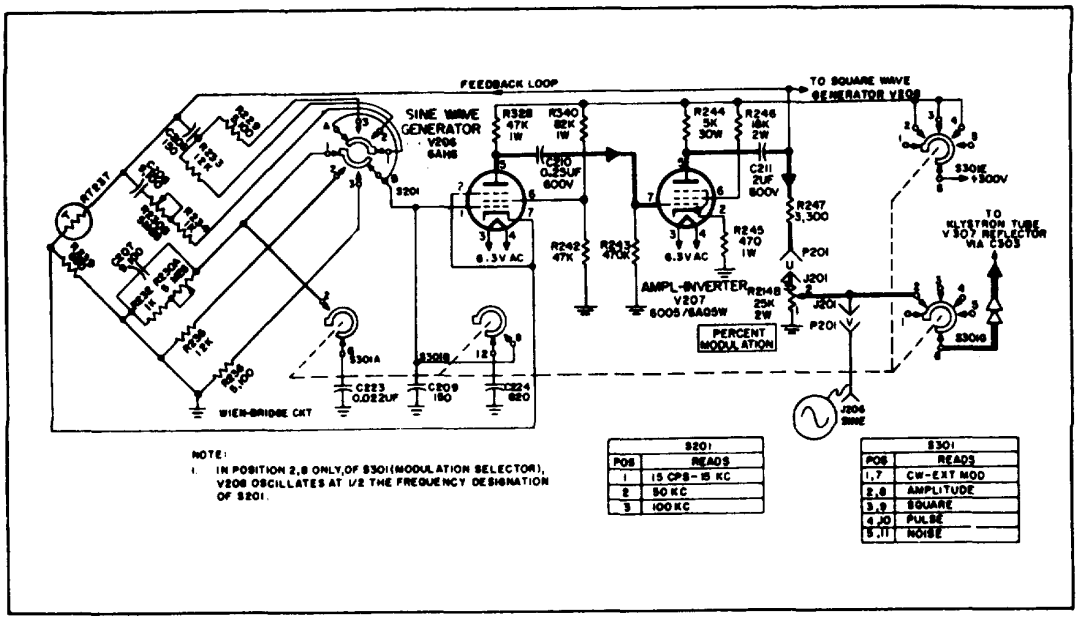


Figure 6-4. Sine-wave Generator, Simplified Schematic Diagram

6-11. SINE-WAVE GENERATOR CIRCUIT. Tube V206 is an oscillator tube. Tube V207 acts as an amplifier and inverter. Thus, without the bridge circuit, this system oscillates, since any signal that appears at the grid (pin 1) of V206 is amplified and inverted by both V206 and V207. The voltage feedback to the grid of V206, which reinforces the initial signal, causes oscillations to be set up and maintained. This system is capable of amplifying voltages over a very wide range of frequencies. Voltages of any frequency or of any combination of frequencies can cause oscillation. A bridge circuit is used to eliminate feedback voltages of all frequencies except the single desired frequency.

6-12. WIEN-BRIDGE CIRCUIT. The bridge circuit is used to eliminate all frequencies except the desired frequency. The Wien-bridge allows a voltage of only one frequency to be fed back from V207 to V206 because of degeneration and phase shift provided by the circuit. The fixed legs of the Wien-bridge consisting of thermistor RT237 and resistor R239 provide degenerative feedback. This feedback is practically constant for all frequencies. The variable legs of the Wien-bridge for 100 kc frequency, as shown in figure 6-4, consist of capacitors C206 and C209, and resistors R229 and R236. They provide positive (regenerative) feedback equal to the negative (degenerative) feedback only at the desired frequency. Thermistor RT237 is used to stabilize the amplitude of oscillation. If the amplitude of oscillation increases, the current through the thermistor will increase, and because of non-linearity, the resistance of the thermistor will decrease. Therefore, the voltage drop across RT237 decreases, resulting in a greater degenerative potential at the cathode, pin 7, of V206. This action reduces the gain of V206, thereby holding the output voltage at a nearly constant amplitude. The values of the resistors in the variable legs of the Wien-bridge increase as the frequency decreases. For a frequency of 100 kc, as stated, the resistors in the variable legs are R229 and R236. Each has a resistance of 5100 ohms. For a frequency of 50 kc (half as great), the resistors in the variable legs are R233 and R235. Each has a resistance of 12,000 ohms (approximately twice the value of R229 and R236).

NOTE

In all positions of the MOD FREQ SEL switch and for the AMPLITUDE position only of the MODULATION SELECTOR switch, sine wave generator V206 oscillates at one-half the front panel MOD FREQ SEL frequency designations. (See figure 10-19.)

6-13. OUTPUT SIGNAL. The sine wave output at the selected frequency is available for display at test point jack J206. This output is fed directly to the square wave generator, and through a voltage dividing network, consisting of resistors R247 and R214B, to the AMPLITUDE position of MODULATION SELECTOR switch S301. The amplitude of the sine wave supplied to the MODULATION SELECTOR

switch can be adjusted by the PERCENT MODULATION control R214B. The sine wave generator operates in the AMPLITUDE, SQUARE, and PULSE positions of the MODULATION SELECTOR switch S301.

6-14. SQUARE WAVE GENERATOR. The square wave generator (see figure 6-5) is a bi-stable multivibrator, with coupled cathodes, that produces a square wave output from a sine wave trigger. The operation is as follows:

a. Condition one: section A of V208 conducts, causing the grid (pin 7) of section B to be at a large negative potential, cutting off section B. Condition two: V208B conducts, causing the cathode (pin 3) of V208A to be at a higher potential, thereby cutting off V208A. The transition from one condition to the other is initiated by the sine wave. Assume V208B is conducting and section A is cut off. A positive going sine wave will cause the voltage at the grid (pin 2) of V208A to rise above cutoff. As conduction begins, the negative-going voltage at the plate (pin 1) of V208A is fed to the grid (pin 7) of V208B. Due to the regenerative action of the cathode resistor R254, V208B is cut off, while tube V208A is conducting. As long as the sine wave remains above the value required to make tube V208A conduct, a condition of stability will exist. When the sine wave goes into the negative half cycle, tube V208A is cut off. By similar coupling action, tube V208B is made to conduct. The circuit has now completed one cycle. Speed-up capacitor C213 is used to decrease the transition time.

b. The square wave generator operates only when the MODULATION SELECTOR switch S301 is in either the SQUARE or PULSE position. In this condition, the grid (pin 2) of V208A is at a potential of approximately +45 volts. This value permits V208A to conduct when triggered by a sine wave. When the modulation selector switch is in any other position, the plate (pin 1) of V208A is deprived of its B+ voltage, making V208A inoperative.

c. The square wave generator output is supplied through capacitor C214 to the pulse amplifier, and also through a network consisting of resistors R257, R256, and capacitor C220 to the SQUARE position of the MODULATION SELECTOR switch. Capacitor C220 acts as a d-c blocking and a-c coupling capacitor. Potentiometer R250 adjusts the symmetry of the square wave.

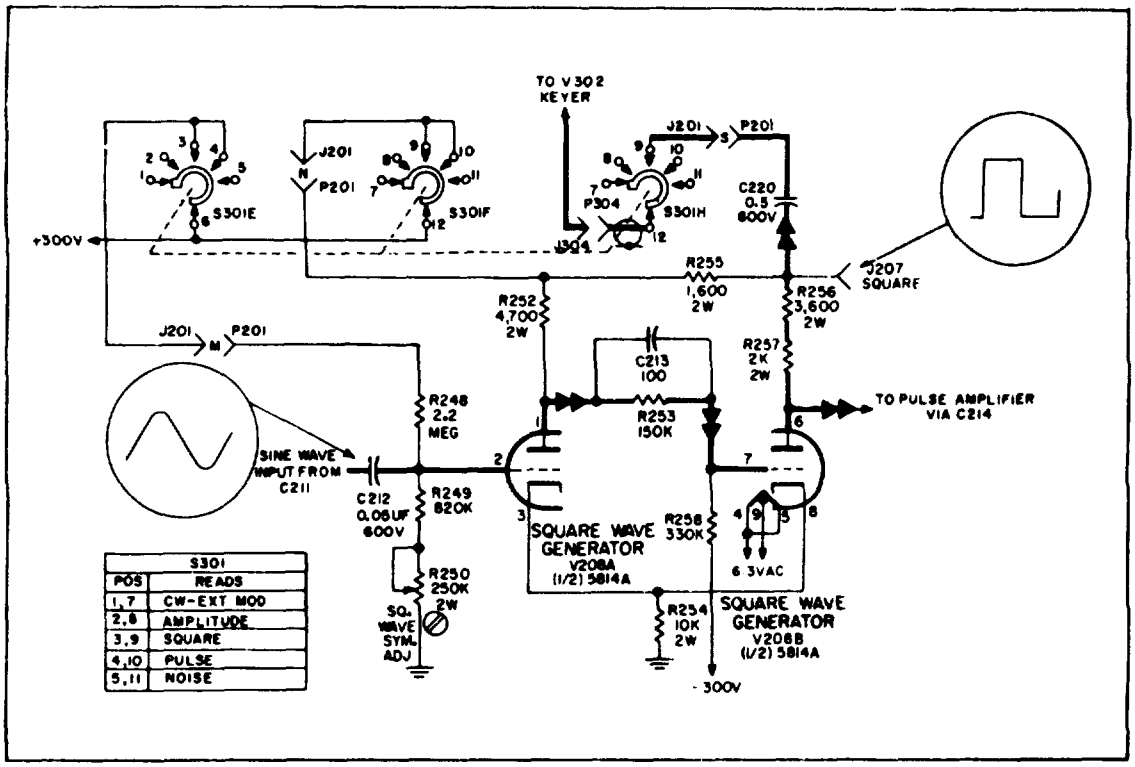


Figure 6-5. Square-wave Generator, Simplified Schematic Diagram

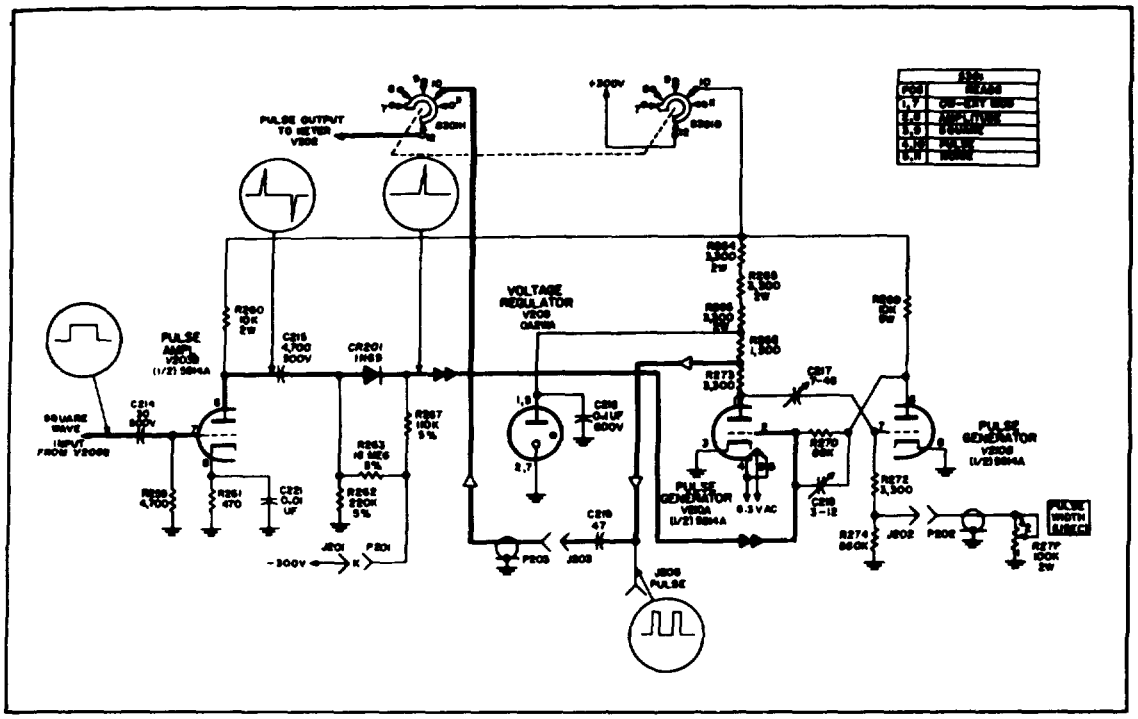


Figure 6-6. Pulse Generator Circuit, Simplified Schematic Diagram

6-15. PULSE GENERATOR CIRCUIT. The pulse generator circuit (see figure 6-6) produces a positive pulse, from one to five microseconds in duration, from a square wave input. The generator is comprised of a differentiating circuit, C214 and R259; a pulse amplifier V203B; crystal detector CR201; voltage regulator V209; pulse generator monostable multivibrator V210; and a pulse width adjust potentiometer R278. The circuit functions as follows:

a. The square wave output of pulse amplifier V208 is differentiated by capacitor C214 and resistor R259, resulting in positive and negative spikes which are applied to the grid of V203B. The signal is amplified and then clipped by crystal detector CR201. The output of the crystal is applied to the grid (pin 2) of monostable multivibrator V210. Resistor network R264, R265, R266, ad voltage regulator V309 serve to supply and regulate a constant B+ of 150 volts to the plate (pin 1) of V210A.

b. A positive trigger is applied to the grid df V210A, causing this section to conduct and increasing the plate current flow. As current flows, the plate voltage drops. This negative-going voltage is applied to the grid of V2 10B, stopping conduction in this section. As the negative voltage starts to leak off, through R272, R278, and R274, the grid of V211B starts to swing positive, causing V2 10B to conduct. As V210B conducts, plate current flows, causing its plate voltage to drop. This negative-going voltage is applied to the grid of V210A through R270 and C218, cutting off V210A. This condition exists until a positive trigger comes along, repeating the cycle once more.

c. The pulse output is available for display at J208 and is fed through coupling capacitor C219 to the PULSE position of MODULATION SELECTOR switch S301.

6-16. NOISE GENERATOR CIRCUIT. The noise generator circuit (see figure 6-7) generates a noise signal greater than 3 mc in bandwidth, and provides one stage of noise amplification. The circuit consists primarily of noise generator V201, a ring magnet mounted in socket, noise amplifier V202, and one half of dual triode, V20SA. The noise generator operates as follows:

a. A two-pole ring magnet surrounds V201, creating a magnetic field through the tube. The noise produced in the tube by gaseous conduction is amplified and extended in bandwidth by the action of the magnetic field, which alters the normal paths of conduction within the tube.

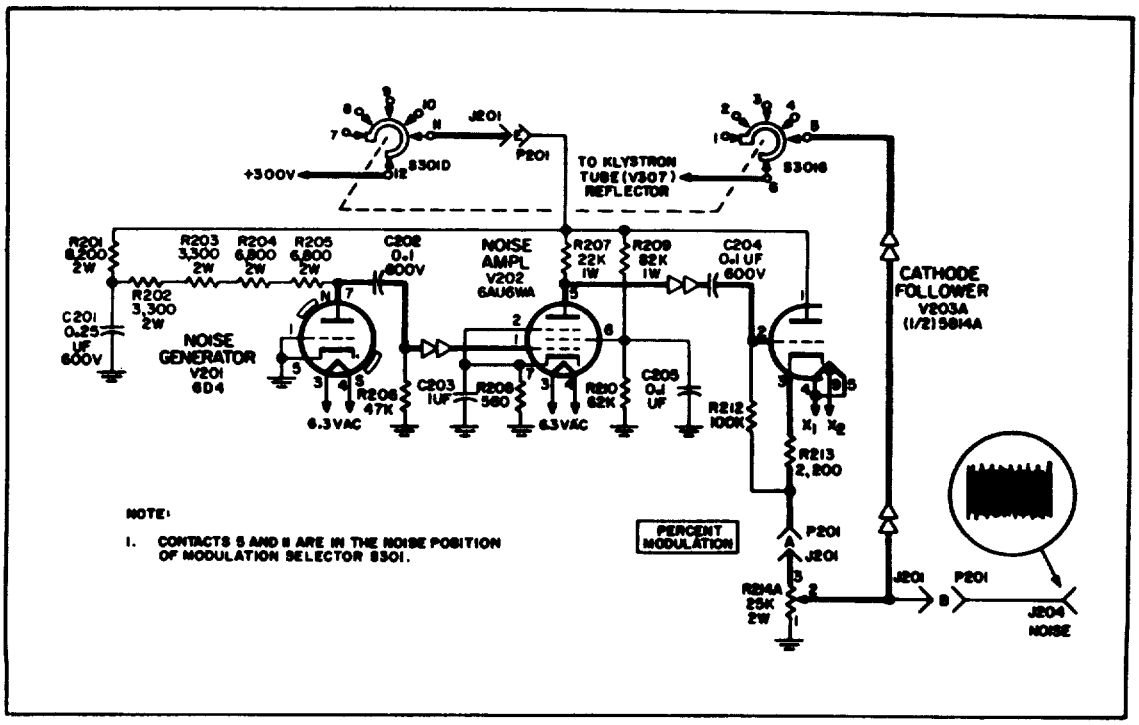


Figure 6-7. Noise Generator Circuit, Simplified Schematic Diagram

b. V202 amplifies the noise signal generated in V201. The output of the amplifier, at pin 5, is coupled to V203A, which acts as a cathode follower to provide a high input-low output impedance.

c. The noise signal output of the cathode follower is fed through PERCENT MODULATION control R214A directly to test jack J204 (provided for checking the waveform) and to the NOISE position of the MODULATION SELECTOR switch 8301.

6-17. SWEEPER CIRCUIT. The sweeper circuit (see figure 10-19) provides a voltage of triangular waveform to the klystron tuner grid, which causes the klystron to be swept via the klystron tuning anode during SWEPT FREQ operation. The circuitry consists of relay switching tube V204; relay B201; miller integrator tube V205; cathode follower V11; and resistance networks, potentiometers, and switches. All of these serve to control the trainer sweep rate and other sweep section functions. Initially, relay switching tube V204 is cut off, and relay K201 feeds -300 volts dc to an RC network. This network consists of resistors (variable and fixed) and capacitors which are placed in or out of the circuit by rotary switch 8302. These capacitors are charged, and the resultant exponential waveform appears across the grid and cathode of miller integrator V205. The integrator tube serves to Improve the linearity of the exponential waveform which is then directly coupled to cathode follower V211. The cathode follower output is fed to the summing amplifier (see paragraph 6-19) and is also fed back to relay switching tube V204, which was cut off. At this point, V204 begin to conduct, energizing relay K201. Relay K201 then feeds +300 volts dc to the RC network, reversing the cycle.

6-18. KEYER SECTION. (See figure 10-19.)

6-19. The keyer section serves to set the klystron tuner grid and reflector voltages at the proper voltage level for the trainer operating frequency and modes of operation. These are determined by the trainer operating control settings. For noise and sine wave modulation, the keyer biases the klystron output as shown in figure 6-2. For pulse and square wave modulation, the keyer biases the klystron output as shown in figure 6-3. During swept frequency operation, sweep inverter V301 receives a portion of the sweeper signal from the output of cathode follower V211 (see paragraph 6-17), through switch S303. This signal is then fed through the appropriate networks, depending on the position of SWEEP SECTOR switch S302, to cathode follower V304A. The swept frequency signal is then fed to summing amplifier tube V305, where the d-c level and the sweep are added. The d-c level is determined by the position of the RF FREQ (RJ15B), LO LIM SET (R353), and HI LIM SET (R335) control network. The summed signal is then fed

to cathode follower V303, which feeds it to the klystron reflector through a resistor capacitor network consisting of R344, R342, C311 and C309, for AMPLITUDE and NOISE modulation. In the case of SQUARE or PULSE modulation, keyer V302 is activated. The keyer serves to shift the pulse or square-wave modulation reflector voltage so that its base line (time) appears just before the beginning of the reflector voltage (see figure 6-2). The reflector protective diode, V304B, prevents the reflector voltage from going positive (a condition which would ruin the klystron). Should the reflector voltage become positive, V304B conducts and acts as a short circuit, removing the positive voltage from the reflector. Voltage reference tube V306 is connected between the screen grid and cathode of the summing amplifier. Since summing amplifier V305 is essentially a d-c amplifier, small variations in screen grid voltage will cause undesirable large plate current variations. Tube V306 prevents this action by keeping the screen grid voltage on summing amplifier V305 constant. During fixed frequency operation, no swept frequency signal is available, and only steady d-c levels are applied to the tuner grid and the reflector. The d-c levels are determined by the setting of the RF FREQ control. The fixed frequency reflector d-c level and the sine wave, square wave or pulse modulation signals are fed to the reflector through the same circuitry as described above, for keyer swept-frequency operation.

6-20. AUDIO AMPLIFIER. (See figure 6-8.)

6-21. The audio amplifier amplifies the signal fed to it from CR501, a crystal detector in the klystron waveguide assembly. The amplifier consists of stages V101, V102, V103, and associated circuitry. A pulse stretcher circuit consisting of R108, CR101 and C108 is provided to increase the audibility of pulsed signals by return of the low frequency component afforded by the stretching of a pulse. The audio volume is controlled by R115, the AUDIO GAIN control, and the output is available at the AUDIO phone jack, J102.

6-22. POWER SUPPLY. (See figure 10-19.)

6-23. The power supply supplies the modulator and transmitter sections with both +300 volt dc and -300 volt dc regulated voltages, from a 105-120V ac,-50440 cps source. The supply consists of a three position power switch, three voltage rectifier tubes, two power transformers, and two voltage regulating circuits hooked up in a normal voltage-regulated power supply circuit.

6-24. The filament voltages for all tubes are supplied by the filament windings on power transformers T401 and T402.

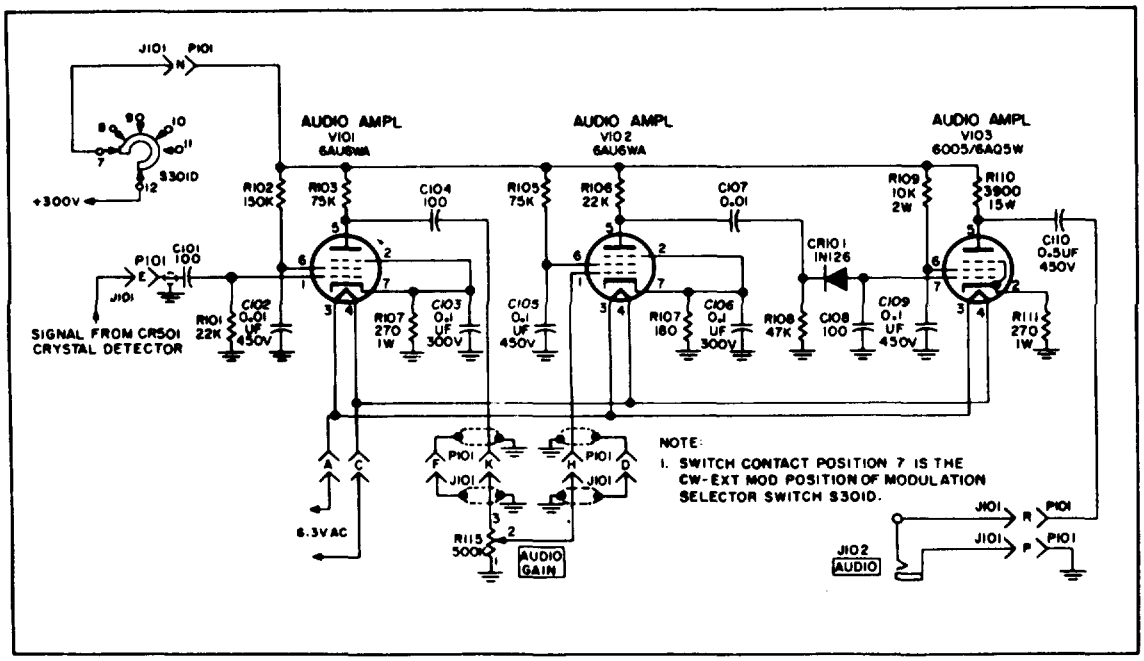


Figure 6-8. Audio Amplifier Circuit, Simplified Schematic Diagram

SECTION VII

MAINTENANCE

7-1. GENERAL.

7-2. EQUIPMENT FAILURE. To insure continuous satisfactory operation of the Radar Signal Interference Trainer, the preventive maintenance and cleaning procedures outlined in paragraph 7-4 must be performed. In the event of equipment breakdown during operation, corrective maintenance procedures given in paragraph 7-11 will facilitate trainer repair. Keep an accurate log in which all failures, modifications, and observations concerning the equipment are entered. This log will serve as a valuable source of operational and maintenance information.

NOTE

All failures of this equipment which are not easily corrected should be promptly reported by filling out Electronic Failure Report (Form DD 787), and sending this report to the Commanding Officer, U. S. Naval Training Device Center, Port Washington, Long Island, New York.

7-3. TEST EQUIPMENT REQUIRED. The following test equipment is required for use in troubleshooting procedures:

a. Tektronix 514D oscilloscope, or an equivalent oscilloscope with a vertical bandwidth greater than 15 mc.

b. Multimeter AN/PSM-4.

c. Wavemeter - Frequency Meter FR-19(XW)/U.

d. VTVM - Electronic Multimeter TS-505/U.

e. Phase Shifting Network- Polarad Electronics Model No. MK-1 (figure 7-9) or equivalent.

f. Tube Tester, Mutual Conductance Type - Hickok TV-3B/U or equivalent.

7-4. PREVENTIVE MAINTENANCE.

7-5. Perform the periodic checks given in table 7-1 carefully in order to assure continuous satisfactory operation, and to maintain the trainer at peak operating efficiency. In addition, keep the trainer clean and free of dirt at all times.

TABLE 7-1. PREVENTIVE MAINTENANCE CHECK

WHAT TO CHECK	POSSIBLE DEFECT	REMEDY
Front Panel	Visually inspect front panel for dirt and corrosion, broken or loose switches, knobs and loose or missing screws. lined in paragraphs 7-4 through 7-8.	Clean and repair all defective, dirty or deteriorated components. Tighten all screws. Use procedures out-
All Cables	Visually check for frayed or loose ends and signs of deterioration. Check all wiring connections.	Replace all defective or frayed wiring. Re-solder loose connections.
Interior of Trainer	Visually check for loose connections, corrosion or deterioration.	Repair loose connections and replace corroded or deteriorated
		parts
Power Supply Voltages	Defective component in power supply or misadjustment of power supply controls.	Locate, repair and replace defective components, using table 7-3 as an aid in trouble-shooting power supply. Reset power supply adjustments as instructed in table 7-4.
Resistors	Resistors may be cracked, charred or discolored.	Replace any resistors displaying a defect.
Capacitors	Capacitors may be bulging, leaking or have loose leads.	Replace any capacitors displaying a defect.
Electron Tubes	Visually check electron tubes for open filaments, cracked or loose envelopes, cracked bases.	Replace any electron tube displaying a defect.

WARNING

Turn all power off to allow all electron tubes to cool, before starting maintenance procedures. Observe special caution when in the vicinity of the klystron tube. Very high temperatures exist In this area.

7-6. Should the painted finish on the panel or covers become badly scarred or damaged, corrosion may be prevented by touching up the bared spots with the proper paint. Use a No. 00 or No. 000 sandpaper to clean the surface down to the bare metal and obtain a bright smooth finish, prior to using touch-up paint. The following items should be on hand for routine cleaning of the equipment:

a. Brush, soft hair, paint type.
b. Cloth, lint free.
c. Sandpaper, No. 0000.
d. Solvent, dry cleaning type.
e. Benzene.
f. Pliers, long nose and side cutters.
g. Screwdriver.
h. Soldering iron.
i. Solder.

CAUTION

Never use steel wool to clean the equipment. Minute particles may enter the equipment and cause shorting of circuits.

7-7. CLEANING THE TRAINER.

7-8. The equipment can easily be cleaned without disassembling. Wipe all dust from between parts with a dry cloth. Use a dry brush to remove dust from terminal strips, switches and wiring. Never use a damp or wet cloth to clean wiring. If dirt or corrosion exist which cannot be removed with a dry cloth or brush, use a cloth slightly moistened with a cleaning solvent, then wipe thoroughly dry. Do not, however, use solvent on electrical contacts. These should be cleaned with benzene and then wiped dry with a clean cloth. For dirt and corrosion that cannot be removed with solvent, use a No. 0000 sandpaper. After sand-papering, reclean with solvent and wipe dry.

7-9. LUBRICATION.

7-10. Radar Signal Interference Trainer Device 15X12 requires no lubrication.

7-11. CORRECTIVE MAINTENANCE.

7-12. The corrective maintenance procedures outlined in table 7-2 are designed to isolate and localize any troubles that may occur within the trainer. Many failures of the equipment maybe traced to relatively simple causes such as broken wire, poor connections, defective tube, or blown fuse. Make all checks systematically. Haphazard checking wastes time and cause further trouble. The test equipment required to perform the troubleshooting tests is listed in paragraph 7-3.

WARNING

This equipment employs voltages which are dangerous If contacted by operating personnel. Caution must be exercised when working with this equipment. Turn all power off for three minutes, before starting maintenance procedures.

TABLE 7-2. TROUBLE-SHOOTING CHART

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
1	Power switch in STAND BY position but amber lamp does not glow.	a. Failure of external power source. b. Fuse burned out. c. Defective lamp DS402. d. Transformer T402 defective. e. Defective switch S401. f. Defective power cable or connector J403, P403, J406.	a. Check external power source for failure. b. Determine cause of blown fuse; correct, and replace fuse. c. Replace lamp. d. Replace transformer. e. Replace switch. f. Replace defective component.

TABLE 7-2. TROUBLE-SHOOTING CHART (cont)

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
2	Power switch 8401 in TRANSMIT position; red lamp does not glow, but amber lamp in step 1 above, does.	a. Defective lamp DS401. b. Transformer T401 defective. c. Defective connector J403, P403.	a. Replace lamp. b. Replace transformer. c. Replace connector.
3	With power switch in TRANSMIT position, meter M301 does not register in any position of the MODULATION SELECTOR switch. (In PULSE position, meter M301 normally does not register.)	a. Defective crystal CR501. b. Defective power supply. c. Reflector not tracked. d. Defective klystron V307. e. Defective switch S301. f. Defective meter M301.	a. Replace crystal. b. Check all power supply voltage tubes, and components. See table 7-3 and figure 10-19. Locate defective part and replace. c. Adjust tracking per paragraph 7-20. d. Replace klystron. e. Replace switch. f. Replace meter.
4	In the NOISE position only of the MODULATION SELECTOR, for all positions of PERCENT MODULATION control, meter M301 reads the same as in CW-EXT MOD position.	a. Loss of noise modulation. b. Defective contact on MODULATION SELECTOR switch S301, NOISE position.	a. Check V201, V202, and V103. Check waveform at J204 against figure 7-1. b. Replace or repair switch.
5	In the AMPLITUDE position of the MODULATION SELECTOR, at all positions of PERCENT. MODULATION control, meter M301 reads the same as in CW-EXT MOD position. In this came, the SQUARE and PULSE positions of the MODULATION SELECTOR would also indicate abnormal readings.	a. Loss of sine wave modulation. b. Defective contact on MODULATION SELECTOR switch 8301, AMPLITUDE position.	a. Check V206 and V207. Check waveform at J206 against figure 7-2. b. Replace or repair switch.
6	In the SQUARE position only of the MODULATION SELECTOR switch, meter M301 does not register but operated properly in step 5.	a. Loss of square wave modulation. b. Keyer section inoperative - c. Defective contact on MODULATION SELECTOR switch S301, SQUARE position.	a. Check V208. Check waveform at J207 against figure 7-3. b. Locate, repair or replace defective component. c. Replace or repair switch.

TABLE 7-2. TROUBLE-SHOOTING CHART (cont)

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
7	In the PULSE position only of the MODULATION SELECTOR switch, meter M301 Indicates a very small amount or 0.	a. This is normal.	a. See paragraph 2-8.
8	In the PULSE position only of the MODULATION SELECTOR switch, meter M301 gives 0 indication, but no pulses appear on the radar set. Trainer operates satisfactorily in steps 5 and 6.	a. Loss of pulse modulation. b. Defective contact on MODULATION SELECTOR switch S301, PULSE position.	a. Check V203, V209 and V210. Check waveform at J208 against figure 7-4. b. Replace or repair switch.
9	In the CW-EXT MOD position of the MODULATION SELECTOR switch, using external modulation, meter M301 registers the same as without external modulation.	a. Loss of eternal modulation. b. Defective EXT MOD connector. c. Defective external modulation connecting cable.	Check external modulation source. b. Check and replace defective connector. c. Replace defective cable.
10	No signal heard in headset; trainer and radar met synchronously tuned; meter M301 registering.	a. Defective V101, V102, or V103; or associated component. b. Defective AUDIO connector. c. Defective headset. d. Defective connector J101, P101.	a. Check and replace defective tube or component. b. Replace connector. c. Replace headset. d. Replace defective connector.
11	Signal heard in headset and M301 does not register; trainer known to be operating due to observation o radar display.	a. Defective meter M301. b. Defective resistor R399.	a. Replace meter. b. Replace resistor.

7-13. TROUBLE-SHOOTING. Certain steps of table 7-2 call for checking tubes or signal waveforms. First check the tubes with a mutual conductance tube tester and replace as required. If the tube is satisfactory, check the circuit voltage and resistance values, as given in table 7-3. Replace faulty components as required. To view the waveform connect an oscilloscope to the test Jack and ground. See figures 7-1 through 7-4 for waveshapes and figure 1019 for the overall schematic diagram.

NOTES

All measurements in table 7-3 shall be made under the following conditions:

1. Line voltage set to 115 volts, 60 cycles.
2. Use Electronic Multimeter TS-505/U.
3. All measurements from pin to ground, unless otherwise indicated.
4. All voltage measurements dc, unless otherwise indicated.
5. Power switch in TRANSMIT position.
6. PERCENT MODULATION and AUDIO GAIN controls set to maximum clockwise position.
7. RF FREQ control set to 100.
8. MOD FREQ SEL switch set to 15 CPS-15 KC; VAR FREQ control to 200 CPS.
9. FIXED-SWEPT FREQ switch in FIXED position except those marked with an asterisk (*).
10. *These voltages will vary when the FIXEDSWEPT FREQ switch is in the SWEPT FREQ position.
11. **MODULATION SELECTOR switch set at position indicated in this column.

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V101	6AUWA	1 2 3 to 4 5 6 7	0 1.25 6.3AC 47 90 1.25	22K 270 0 INFINITY INFINITY 270	CW
V102	6AU6WA	1 2 3 to 4 5 6 7	0 1.45 6.3AC 155 120 1. 45	500K 180 0 INFINITY INFINITY 180	CW
V103	6005/6AQ5W	1,7 2 3 to 4 5 6	0 11 6.3AC 142 250	1.6MEG 270 0 INFINITY INFINITY	CW
V201	6D4	1 3 to 4 5 7	0 6.3AC 0 18	0 0 0 175K	NOISE
V202	6AU6WA	1 2 3 to 4 5 6 7	-0. 8 1.75 6.3AC 260 0 0	48K 570 0 170K 64K 570	NOISE
V203	5814A	1 2 3 4, 5 to 9 6 7 8	300 95 125 6.3AC -145 0 0	145K 125K 28K 0 175K 4.7K 480	NOISE
V204	12AT7WA	1 2 3. 4, 5 to 9 6 7 8	*0 -140 0 6. 3AC *0 -140 0	10. 5K 220K 0 0 10. 5K 220K 0	PULSE
V205	6AUGWA	1 2 3 to 4 5 5 7	-60 0 6.3AC *-24 0 0	10MEG 0 0 540K 29K 0	PULSE

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V206	6AH6	1 2 3 to 4 5 6 7	0 1.5 6.3AC 215 100 1. 5	87K 700 0 97K 36K 700	PULSE
V207	6005/6AQ5W	2 3 to 4 5 6 7	15 6.3AC 150 230 0	470 0 130K 140K 470K	PULSE
V208	5814A	1 2 3 4, 5 to 9 6 7 8	270 87 110 6.3AC 270 90 110	50K 680K 11 0 54K 135K 11K	PULSE
V209	OA2WA	1, 5 3, 7	150 0	180K 0	PULSE
V210	5814A	1 2 3 4, 5 to 9 6 7 8	108 -26 0 6.3AC 175 -4.6 0	220K 120K 0 0 190K 22K 0	PULSE
V211	6100/6C4WA	1 3 to 4 5 6 7	-125 6.3AC -125 *-140 *-140	100K 0 100K 650K 150K	PULSE
V301	6100/6C4WA	3 to 4 5 6 7	6.3AC *75 *-230 *-210	0 230K 230K 90K	PULSE
V302	6AU6WA	1 2 3 to 4 5 6 7	-300 -300 6.3 AC -130 -205 -300	1.15MEG 23K 0 1.15 MEG 30K 23K	PULSE
V303	6100/6C4WA	1, 5 3 to 4 6 7	300 6.3 AC -110 -95	50K 0 155K 1.15MEG	PULSE

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V304	12AT7WA	1 2 3 4, 5 to 9 6 7 8	300 0 4.5 6.3AC 90 -90 0	80K 22K 190K 0 900K 900K 0	PULSE
V305	6AU6WA	1 2 3 to 4 5 6 7	-200 -195 6. 3AC -110 -110 195	110 40K 0 150K 150K 33K	PULSE
V306	6100/6C4WA	1, 5 3 to 4 6 7	0 6.3AC -00 -195	0 0 75K 32K	PULSE
V307	2K45	1 2 3 5 6 to7 8	-3 3.6 -180 0 6.3AC -3	950K 750 1 MEG 0 0 950K	PULSE
V401	5R4WGA	2 4 6 8	520 - - 520	85K 30 38 85K	PULSE
V402	6080WA	1 2 3 4 5 6 7 to 8	185 520 300 185 520 300 6.3AC	1.6MEG 85K 46K 1.65MEG 85K 47K 0	PULSE
V403	5751	1 2 3 4, 5 to 9 6 7 8	50 0 0 6.3AC 175 42 50	370K 270K 0 0 1.65MEG 180K 370K	PULSE
V404	6X4W	1 3 to 4 6 7	-300 6.3AC -300 230	22K 0 22K 100K	PULSE
V405	6X4W	1 3 to 4 6 7	-300 6.3AC -300 230	22K 0 22K 100K	PULSE

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V406	6L6WGB	2 to 7	6. 3AC	0	
		3	230	25K	
		4	285	17K	PULSE
		5	-24	1. 1MEG	
		6	300	46K	
		8	0	0	
V407	5751	1	-115	170K	
		2	-195	250K	
		3	-215	106K	
		4, 5 to 9	6.3AC	0	PULSE
		6	-24	1.1MEz	
		7	-107	400K	
		8	-115	170K	
V408	5651	1, 5	-215	100K	PULSE
		2, 7	-300	22K	
V410	6080WA	1	175	1.65MEG	
		2	520	85K	
		3	300	46K	
		4	175	1.65MEG	PULSE
		5	520	85K	
		6	350	46K	
		7 to 8	6.3AC	0	

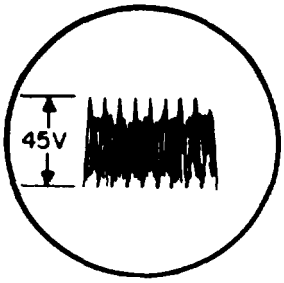


Figure 7-1. Noise Modulation Waveform at J204

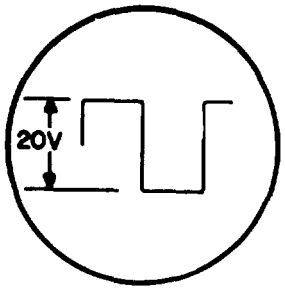


Figure 7-3. Square-wave Modulation Waveform at J207

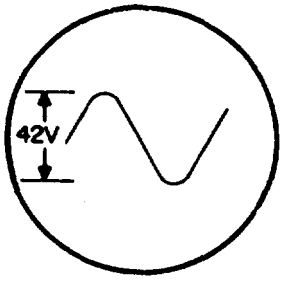


Figure 7-2. Amplitude Modulation Waveform at J206

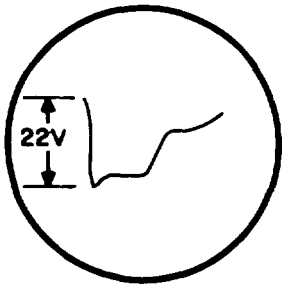


Figure 7-4. Pulse Modulation Waveform at J208

7-14. INTERNAL ADJUSTMENTS

7-15. While great care has been taken in the design and manufacture of the trainer, aging or replacement of components will require re-setting of the internal adjustments. All internal adjustments have been factory-set and sealed with a semi-permanent seal to prevent undesired loosening. Since all adjustments affect the klystron tuning and sweeping circuits, unnecessary adjustments should not be made.

NOTE

The need for readjustment of the internal adjustments will be indicated by a difficulty in tuning the trainer through the X-Band (8500 to 9600 mc) in either the fixed or swept frequency mode ofd operation. Readjustment is also indicated if the RF FREQ control, when set to 50, does not fix the trainer operating frequency at the middle of the X-Band (approximately 9000 mc).

7-16. The trainer utilizes two d-c voltage-regulated power supplies (+300 and -300 volts), each of which may require adjustment. These adjustments are made by varying potentiometers R414 and R428, respectively (see figure 7-5). Set power switch S401 to the TRANSMIT position. Set MODULATION SELECTOR and FIXED-SWEPT FREQ switches to PULSE and SWEPT FREQ position, respectively. Adjust potentiometers R428 and R414, using the procedure listed in table 7-4. Since the -300 volt supply is used a. a reference for the +300 volt supply, R428 must be adjusted before R414.

NOTE

Accurate settings of the power supply voltages are extremely important in maintaining the proper calibration of the RF FREQ control. An inaccurately adjusted power supply will change the operating frequency of the trainer.

WARNING

Exercise extreme caution when connecting meter test prods to J401 or J402. Use insulated test prods only. Voltages dangerous to life exist at these points.

TABLE 7-4. POWER SUPPLY ADJUSTMENTS

STEP	ADJUSTMENT	EQUIPMENT REQUIRED	SETTING
1	R428	Multimeter AN/PSM-4, set to 1000 volts dc range.	Connect negative test prod to J402 and positive test prod to ground (chassis). Adjust and lock R428 to read 300 volts dc on the meter.
2	R414	Multimeter AN/PSM-4, set to 1000 volts dc range.	Connect positive test prod to J401 and negative test prod to ground (chassis). Adjust and lock R414 to read 300 volts dc on the meter.

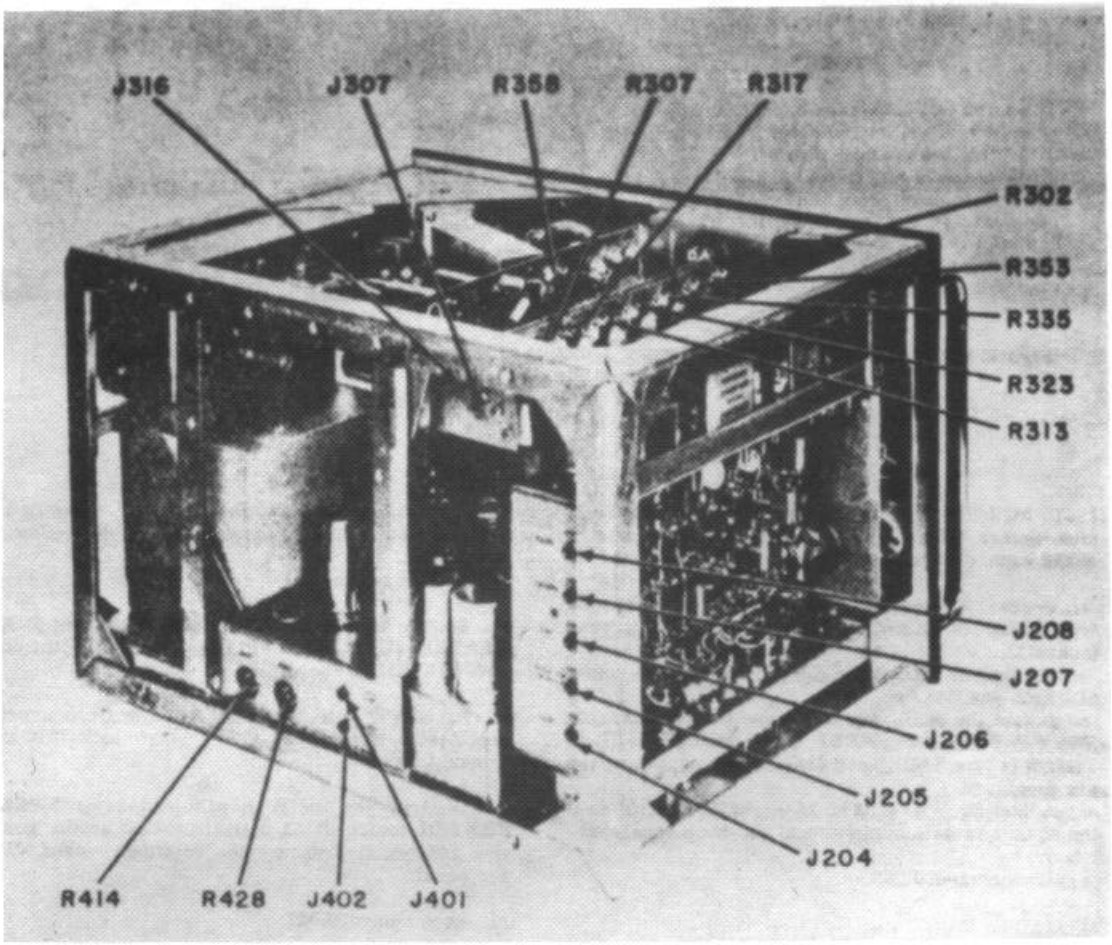


Figure 7-5. Location of Internal Adjustments and Test Jacks

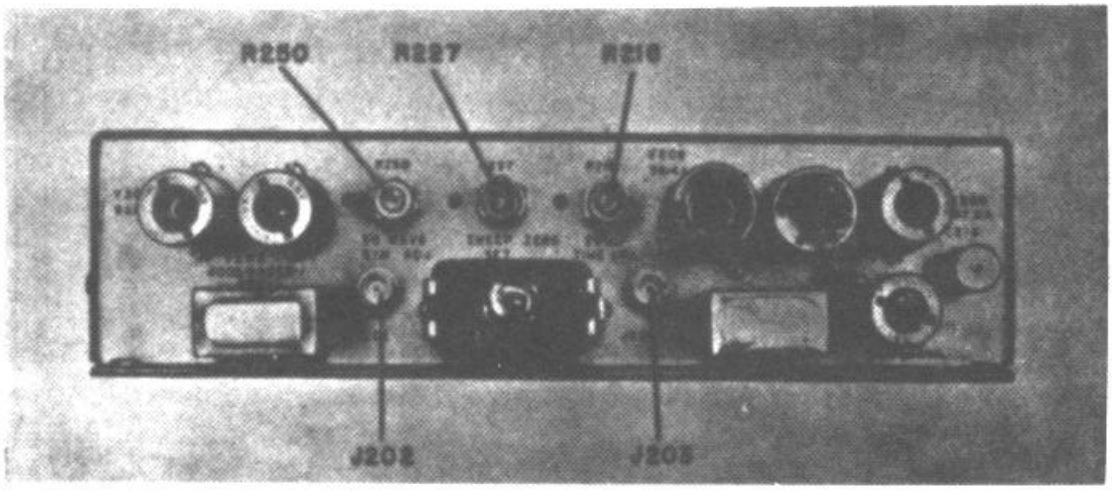


Figure 7-6. Modulator Chassis Showing Location of Square-wave Symmetry, Sweep Zero Set and Sweep Time Adjustments

7-17. SQUARE WAVE SYMMETRY ADJUSTMENT. (See figures 7-5 and 7-6.) To adjust the symmetry of the square wave, use the following procedure:

a. Connect the vertical input (input 1 of Tektronix type 514D) of an oscilloscope to J207 and ground (chassis).

b. Set trainer MODULATION SELECTOR switch to SQUARE position.

c. Adjust the oscilloscope coarse and fine controls (SWEEP TIME and SWEEP TIME MULTIPLIER of Tektronix type 5141)) until at least two square waves are displayed.

d. Adjust sq. WAVE SYM. ADJ. (R250) control until the square wave is symmetrical (on-time equals off-time).

e. Lock control R250.

7-18. SWEEP ZERO SET ADJUSTMENT. (See figures 7-5 and 7-6.) Adjust the sweep zero using the following procedure:

a. Set the trainer FIXED-SWEPT FREQ and MODULATION SELECTOR witches to SWEPT FREQ and CW-EXT MOD positions.

b. Set a VTVM to "0" center d-c scale, and connect test prods to reflector triangle jack J205 and ground (chassis).

c. Observe the meter needle and adjust SWEEP ZERO SET potentiometer R227, until the negative and positive excursions on either side of "0" are equal.

d. Lock control R227.

7-19. SWEEP CENTER ADJUSTMENT. (be figure 7-5). To adjust the sweep center, use the following procedure:

a. Set the trainer FIXED-SWEPT FREQ and MODULATION SELECTOR switches to SWEPT FREQ and CW-EXT MOD, respectively.

b. Set a VTVM to "0" center d-c scale, and connect test prods to tuner grid triangle Jack J316 and ground (chassis).

c. Observe the meter needle and adjust SWEEP CENTER control R323 until the meter needle positive and negative excursions on either side of "O" are equal.

d. Lock control R323.

7-20. REFLECTOR VOLTAGE TRACKING PROCEDURE.

7-21. This procedure assumes that the unit was previously aligned and operating, but that the trainer RF FREQ control is out of calibration, or the klystron was changed, or tracking adjustments were disturbed. Use the test set-up shown in figure 7-7 and the procedure described in paragraphs 7-22 through 7-26. The phase shifting network is Polarad type MK-1, or can be constructed as shown in figure 7-9. These paragraphs are concerned with the klystron reflector low and high limit adjustments.

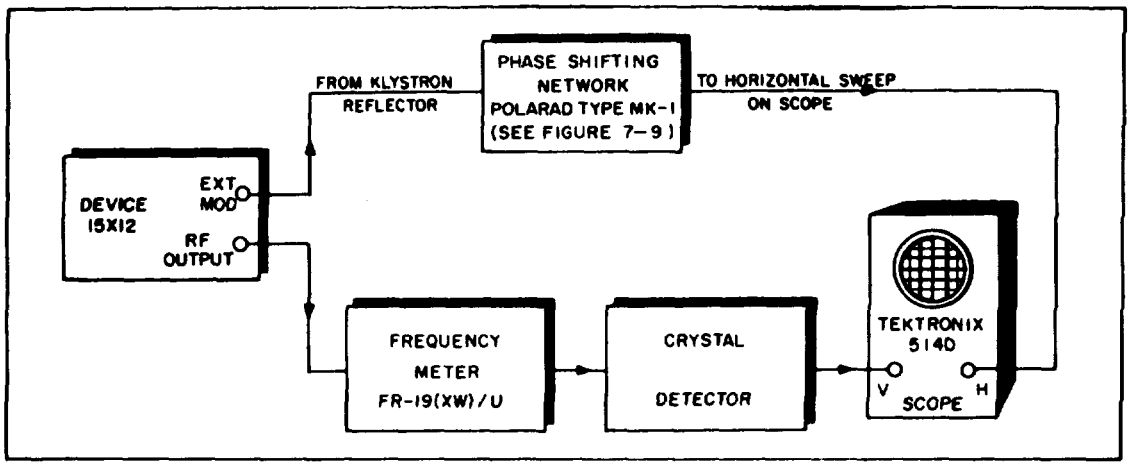


Figure 7-7. Test Set-up, Reflector Voltage Adjustments

7-22. LOW LIMIT CONTROL ADJUSTMENTS. (See figure 7-5.)

7-23. Set the trainer panel MODULATION SELECTOR, FIXED-SWEPT FREQ, and RF FREQ controls to CW-EXT MOD, FIXED and 0 positions, respectively. Adjust the low limit controls using the following procedure:

a. Adjust the reflector LO LIM SET control R353 until the 3-3/4 mode trace is centered on the oscilloscope.

b. Measure the frequency at center of trace. This frequency should be 8300 mc - 8500 mc. (See figure 7-8.)

c. If the frequency is not as specified in step b, adjust the tuner grid LO LIM SET control R313.

d. Readjust and lock R353 and R313, if necessary.

e. Measure and note the low limit reflector and tuner grid d-c voltages, using a VTVM.

7-24. HIGH LIMIT CONTROL ADJUSTMENTS. (See figure 7-5.)

7-25. PROCEDURE. Set the trainer panel MODULATION SELECTOR, FIXED-SWEPT FREQ, and RF FREQ switches to CW-EXT MOD, FIXED and 100, respectively. Adjust the high limit controls, using the following procedure:

a. Adjust the reflector H1 LIM SET control R335 until the 3-3/4 mode trace is centered on the oscilloscope.

b. Measure the frequency at center of trace. The frequency should be 9600 mc - 9800 mc.

c. If the frequency Is not as specified in step b, adjust the tuner grid HI LIM SET control R317.

d. Readjust R335 and R317, if necessary.

e. Measure and note the high limit reflector and tuner grid d-c voltages, using a VTVM.

NOTE

Steps f and g are not pertinent to setting the high limit adjustments, but are required in making the sweep amplitude adjustments in paragraph 7-27.

f. Set the wavemeter to 9050 mc and vary the RF FREQ control until the dip is set to the center of the mode. (See figure 7-8.) Note the position of the RF FREQ control.

g. Measure and note the reflector and tuner grid d-c voltages, using a VTVM.

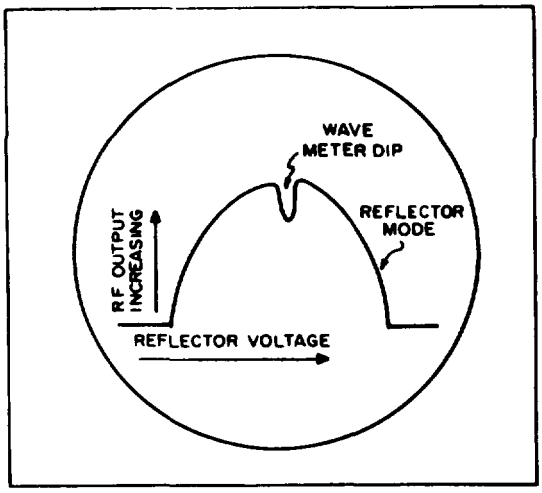


Figure 7-8. Typical Mode Trace

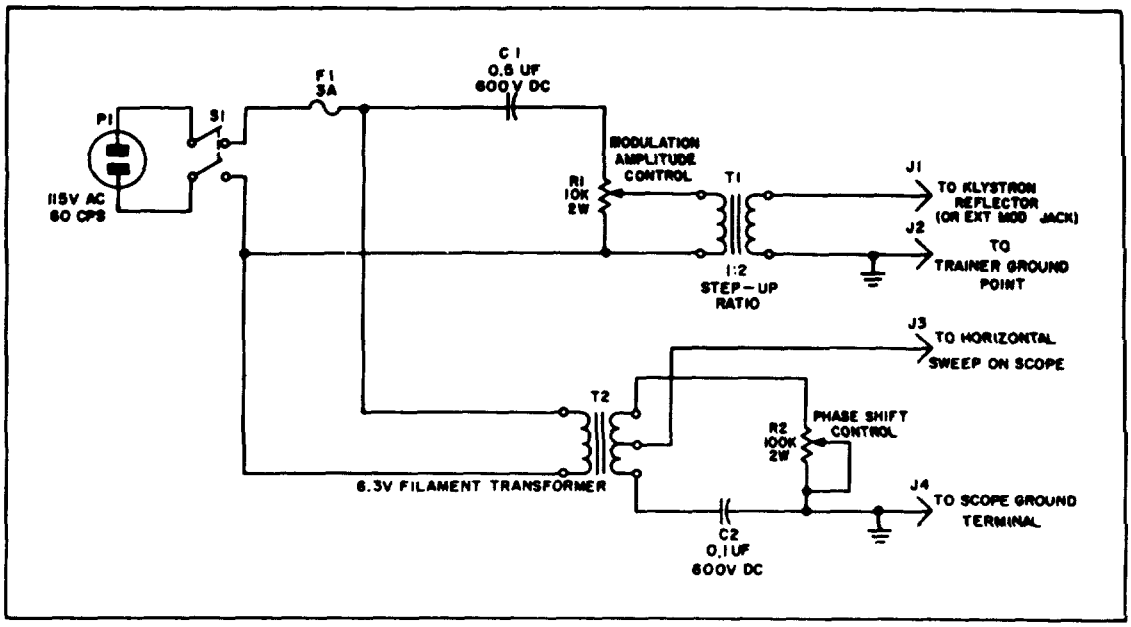


Figure 7-9. Phase Shifting Network, Schematic Diagram

7-26. READJUSTMENT OF LIMIT CONTROLS.
Slight "touching up" d limit controls may be necessary after making the above adjustments. This is necessitated by interaction effects, brought about when variable components within the same circuit are adjusted simultaneously. Repeat paragraphs 7-22 through 7-25, readjusting controls, as necessary.

7-27. SWEEP AMPLITUDE CONTROLS. (See figure 7-5.)

7-28. Reflector voltages will vary with the sweep rate when the trainer is in swept frequency operation. The sweep amplitude controls must thus be adjusted until the voltages applied to the reflector and tuner grid vary between the low and high limit voltages measured in steps e of paragraphs 7-23 and 7-35. To adjust the reflector SWEEP AMPL (R302) and tuner grid SWEEP AMPL (R307) controls, set the trainer FIXED-SWEPT FREQ switch to SWEPT FREQ, SWEEP SECTOR to 1100, and SWEEP RATE to its maximum counterclockwise position. Set the RF FREQ control to the 0050 mc position, as determined in step *f*, paragraph 7-25.

a. Connect the d-c VTVM to the klystron reflector (unction of J302 and CSOS3) and ground.

b. Vary the reflector SWEEP AMPL control (R302) until the meter fluctuates between reflector low and high limit d-c voltages, corresponding to those measured in steps *e* of paragraphs 7-23 and 7-25.

c. Connect a d-c VTVM to the klystron tuner grid (J307) and ground.

d. Vary the tuner grid SWEEP AMPL control (R307) until the meter fluctuates between the tuner grid low and high limit d-c voltages, corresponding to those measured in steps e of paragraphs 7-23 and 7-25.

e. Readjust and lock R302 and R307, if necessary.

7-29. SWEEP TIME ADJUSTMENT. (See figures 7-5 and 7-6.)

7-30. The sweep time adjustment is supplied to compensate for variations in the sweep rate timing network. It is a screwdriver factory adjustment and may, after an extended period of time, require readjustment. Set the trainer FIXED-SWEPT FREQ switch to SWEPT FREQ, SWEEP SECTOR (MC) switch to 250, and SWEEP RATE (MC/SEC) to 15. Then use the following procedure:

a. Connect a VTVM to reflector triangle Jack J205. The voltage will be seen to vary up and down.

b. Measure the time required for the voltage to rise from the minimum to the maximum value, for the sweep rate and sweep sector positions indicated above.

c. The measured time should be 16.5 seconds; if it is not, readjust the SWEEP TIME ADJ control R218 until the voltage rise time is 16.5 seconds.

SECTION VIII

SUPPLEMENTARY DATA

8-1. STUDENT TESTING AND SCORING.

8-2. To judge the students' progress, periodic tests should be given. Chart 8-1 is supplied as a guide to the instructor in formulating these tests. The instructor may change the form in any way he sees fit to suit the particular training situation. Chart 8-1 test the students ability to absorb the demonstrations set forth in table 4-1. The test is given as follows:

a. The Instructor adjusts the trainer operating controls so that the trainer emits the exact signal characteristics under which the radar set was jammed during the previous lessons.

b. The students under test operate the radar set and apply the technique of tracking through, developed in previous lessons.

c. The Instructor stands near the students and rates their proficiency in tracking-through. The instructor then checks off the appropriate box on the test form (GOOD, FAIR, POOR) and enters any comments In the REMARKS column.

8-3. The instructor should keep a record of each student's rating. (See chart 8-2.) This record will also indicate how well the student has developed the anti-jamming technique (AVERAGE RATING). It will also indicate the are In which the student needs more practice. Chart 8-2 is presented as a guide in setting up a record system of this type.

8-4. TRAINER TUBE COMPLEMENT. Table 8-1 lists the type of electron tubes, quantity per assembly, total quantity of each tube type, and total number of tube per trainer.

CAUTION

Should a tube require replacement, be sure to use the exact replacement, to prevent damage to the trainer. Refer to paragraph 7-14 when replacing the klystron tube, or any tube associated with a critical adjustment.

CHART 8-1. STUDENT SCORING FORM

TEST FORM NUMBER 1	NAME RANK SERIAL NO.			
DEMONSTRATION	STUDENT'S ABILITY TO TRACK THROUGH			REMARKS
	GOOD	FAIR	POOR	
CW Interference				
CW Interference In a swept frequency				
Changing sweep sector				
Changing sweep rate				
Interference by amplitude modulated				
Interference by square wave modulated signal				
Interference by pulse modulated signal				
Interference by noise modulated signal				

CHART 8-2. STUDENT RECORD

NAME _____ DATE STARTED_____
RANK _____
SERIAL NO. _____

TEST NO.	DATE	AVERAGE RATING	REMARKS
1			
2			
3			
4			
5			

8-5. COMPONENT COLOR CODE. See figures 8-1 and 8-2.)

8-6. The resistive and capacitive components utilized in the trainer are identifiable by means of color codes. Figure 8-1 lists the resistor color codes. Figure 8-2 lists the capacitor color codes. Use the methods specified in these figures to determine the numerical value of any color-coded component utilized in the trainer design.

NOTE

To maintain the trainer at peak operating efficiency, replace all defective parts with their exact replacement.

8-7. PREPARING TRAINER FOR STORAGE.

8-8. To prepare the trainer for storage, refer to table 1-1 for Items to be stored, and proceed as directed below:

a. Remove the 25-foot power cord W701 from the power source outlet and from the power input receptacle on the trainer front panel. Store the power cable in the dust cover of the trainer carrying case.

b. Disconnect the headset from the AUDIO connector receptacle on the trainer front panel. Store the headset in the dust cover of the trainer carrying case.

c. Disconnect the rf cable W601 from the RF OUTPUT connector receptacle on the trainer front panel. Disconnect the other end of the rf cable from the antenna. Store the cable and antenna in the dust cover of the trainer carrying case.

d. After checking that all accessories have been removed and securely stored in their resting place within the trainer dust cover, grasp the trainer by its two handles and lower it (face-up) into its carrying case. Place the dust cover with stored accessories over the top of the case and latch the hooks on the main body of the case to the hooks on the dust cover.

8-9. PREPARATION FOR RESHIPMENT.

8-10. To prepare the trainer for re-shipment, follow the instructions set forth in paragraph 8-7 and proceed as follows:

a. Prepare the original packing crate, referred to in paragraph 5-1, for re-use.

b. Pick up the trainer carrying case by its two handles and lower it gently into the packing crate.

c. Surround the carrying case with packing material.

CAUTION

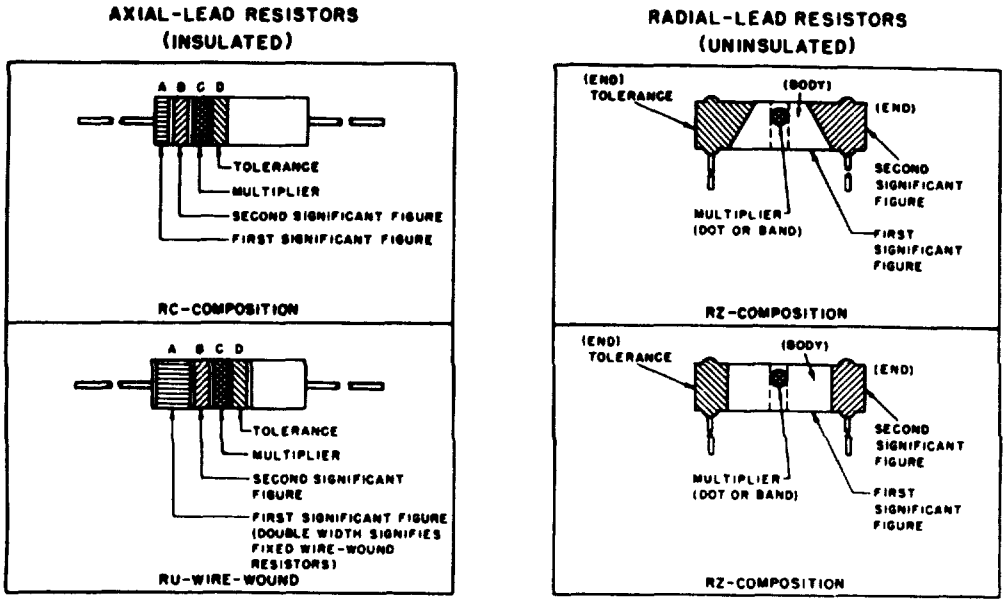
Use care in hammering nails into the packing crate. Do not hammer unnecessarily or force nails into crate at an angle. Exercise extreme care in this operation to prevent damage to the trainer or its carrying cam.

d. Close the crate, using a hammer and nails to secure the crate cover and sides.

TABLE 8-1. TRAINER TUBE COMPLEMENT

TYPE DESIGNATION	QUANTITY PER SECTION						APPLICATION
	AUDIO AMPLIFIER	MODULATOR CHASSIS	KEYER CHASSIS	POWER SUPPLY	KLYSTRON MOUNT	TOTAL QTY EACH TUBE TYPE	
OA2WA		1				1	Miniature voltage regulator tube
12AT7WA		1	1			2	High-mu twin triode
2K45					1	1	Reflex kystron
5R4WGA				1		1	Full-wave high vacuum rectifier, ruggedized
5651				1		1	Miniature voltage reference tube
5751				2		2	High-mu twin triode
5814A		3				3	Medium-mu twin triode
6AH6		1				1	Sharp-cut off pentode
6AU6WA	2	2	2			6	Sharp cutoff pentode
6D4		1				1	Noise generator tube
6L6WGB				1		1	Beam power tube
6X4W				2		2	Full-wave rectifier
6005/6AQ5W	1	1				2	Beam power tube
6080WA				2		2	Low-mu twin power triode
6100/6C4WA		1	3			4	High frequency triode
Total Quantity per Assembly	3	11	6	9	1	---	
Total Quantity per Trainer	-	-	-	-	-	30	

RESISTOR COLOR CODE MARKING
(MIL-STD RESISTORS)



RESISTOR COLOR CODE

BAND A OR BODY*		BAND B OR END*		BAND C OR DOT OR BAND*		BAND D OR END*	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1	BODY	± 20
BROWN	1	BROWN	1	BROWN	10	SILVER	± 10
RED	0	RED	2	RED	100	GOLD	± 5
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000		
GREEN	5	GREEN	5	GREEN	100,000		
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE	7	PURPLE	7				
(VIOLET)		(VIOLET)					
GRAY	8	GRAY	8	GOLD	0.1		
WHITE	9	WHITE	9	SILVER	0.01		

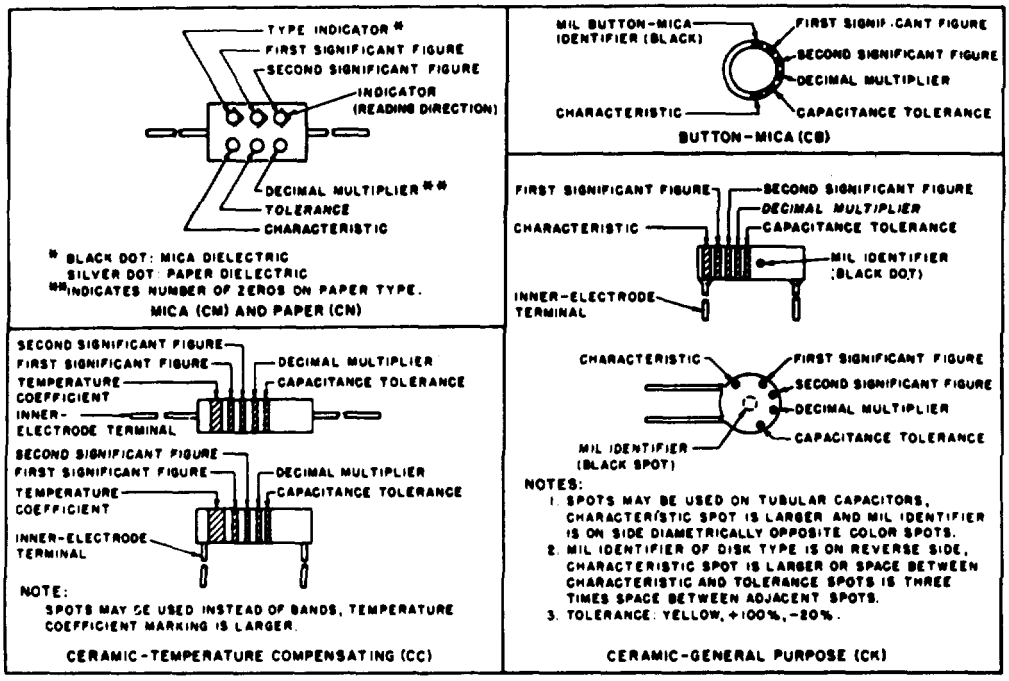
*FOR WIRE-WOUND-TYPE RESISTORS, BAND A SHALL BE DOUBLE-WOIDTH WHEN BOOY COLOR IS THE SAME AS THE DOT (OR BAND) OR END COLOR, THE COLORS ARE DIFFERENTIATED BY SHADE, GLOSS, OR OTHER MEANS.

EXAMPLES (BAND MARKING):
10 OHMS ±20 PERICIENT: BROWN BAND A; BLACK BAND BLACK BAND C, NO BAND D.
4.7 OHMS ±5 PERCENT: YELLOW BAND A,. PURPLE BAND B, GOLD BAND C, GOLD BAND D.

EXAMPLES (BODY MARKING):
10 OHMS ±20 PERCENT: BROWN BODY, BLACK END; BLACK DOT ON BAND; BODY COLOR ON TOLERANCE END.
3,000 OHMS ±10 PERCENT; ORANGE BODY, BLACK END, RED DOT ON BAND, SILVER END. STD-R1

Figure 8-1. Resistor Color Codes

CAPACITOR COLOR CODE MARKING
(MIL-STD CAPACITORS)



CAPACITOR COLOR CODE

COLOR	SIG FIG.	MULTIPLIER DECIMAL	MULTIPLIER NUMBER OF ZEROS	CHARACTERISTIC[1] CM	CN	CB	CK	TOLIEANCE[2] CM	CN	CB	CC OVER 10UUF	CC 10UUF OR LESS	TEMPERATURE COEFFICIENT (UUF/UF/°C) CC
BLACK	0	1	NONE		A			20	20	20	20	2	ZERO
BROWN	1	10	1	B	E	B	W				1		-30
RED	2	100	2	C	H		X	2		2	2		-80
ORANGE	3	1,000	3	D	J	D			30				-150
YELLOW	4	10,000	4	E	P								-220
GREEN	5		5	F	R						5	0.5	-330
BLUE	6		6		S								-470
PURPLE (VIOLET)	7		7		T	W							-750
GRAY	8		8			X						0.25	+30
WHITE	9		9								10	1	-330 (±500)[3]
GOLD		0.1						5		5			+100
SILVER		0.01						10	10	10			

1. LETTERS ARE IN TYPE DESIGNATIONS GIVEN IN MIL-C SPECIFICATIONS.
2. IN PERCENT, EXCEPT IN UUF FOR CC-TYPE CAPACITORS OF 10 UUF OF LESS
3. INTENDED FOR USE IN CIRCUITS NOT REQUIRING COMPENSATION. STD-C1

Figure 8-2. Capacitor Color Codes

SECTION IX

PARTS LIST AND CATALOG

9-1. GENERAL

9-2. This section is a non-illustrated parts list and catalog. It lists the assemblies, sub-assemblies, and detail parts which comprise the Radar Signal Interference Trainer, Device 15X12, manufactured by Polarad Electronics Corporation, Long Island City 1, New York.

9-3. This section also includes an explanation of the method used in interpreting the parts list and catalog which consists of the following:

a. Major Assembly Parts List.

b. Numerical Parts List.

c. Reference Symbol Number List.

9-4. MAJOR ASSEMBLY PARTS LIST. (See table 9-3.)

9-5. ITEM NUMBER COLUMN. This column contains consecutive item numbers which were assigned to parts as they appeared in the order of disassembly.

9-6. REFERENCE SYMBOL NUMBER COLUMN OR FIGURE AND INDEX COLUMN. This column lists reference symbol numbers which have been assigned to electrical parts. These numbers consist of one or two capital letters, followed by three or more significant figures which have been assigned to major assemblies in blocks. Table 9-1 lists each major assembly and its assigned block of numbers. If the user knows the reference symbol number of an electrical part, he can determine to which assembly it belongs. All reference symbol numbers listed are consistent with reference symbol numbers in other sections and drawings of this handbook.

9-7. For parts which have not been assigned reference symbol numbers, a figure and index number may appear in this column. The first two series of figures separated by a dash, being the figure number of an illustration appearing elsewhere in this manual; and the third figure referring to the index number of the part in the illustration.

9-8. PART NAME AND DESCRIPTION COLUMN.

The part name and description column describes each assembly, sub-assembly, detail part and attaching part. Each part name and description is indented to show its relationship to the trainer assembly. Those parts which do not have Government Standard part numbers are fully described.

9-9. ATTACHING PARTS. Attaching parts are listed directly following the assembly or part they attach. A divider (*-----*) divides the last of the attaching parts from the next pt or assembly.

9-10. PRIME CONTRACTOR'S DRAWING NUMB (PART NUMBER). This column lists the individual item drawing numbers for parts on those drawn which have been contracted for by the contracting agency.

9-11. GOVERNMENT TYPE DESIGNATION NUMBER. The Government type designation number column lists the MIL, JAN, AN, M8, or other Government type designations assigned to the part in question

9-12. COMMERCIAL MANUFACTURER AND CATALOG DESIGNATIONS. This column contains tie vendor's code and catalog designation of the manufacturer of each purchased part used in the manufacture of the trainer. Table 9-1 lists each code and the corresponding vendor's name and address.

9-13. NUMERICAL PARTS LIST. (See table 9-4.)

9-14. The numerical parts list is useful in locate detailed item information, It lists in alpha-numerical sequence each item of the equipment in the major assembly parts list, cross-referenced against its respective manufacturer's code, item number, government stock number and source code. In addition, this list also indicates the quantity per kit and the quantity per trainer of each part listed.

9-15. PART NUMBER COLUMN. This column lists the part number of the particular part in question and corresponds to the number entered in column 4, 5, or 6 of the Major Assembly Parts List. These part numbers are arranged alpha-numerically in the following manner:

a. The part number arrangement starts on the left hand column and continues from left to right, one column at a time, until the part number arrangement is determined.

b. The order of precedence in part number arrangement is as follows:

Space (blank column)
Diagonal (slant) /
Point (period
Dash (-)
Letters A through Z
Numerals 0 through 9

9-16. MANUFACTURER'S CODE COLUMN. The manufacturer's code is that code listed in table 9-3 which corresponds to the manufacturer of the particular part in question.

9-17. ITEM NUMBER COLUMN. This column lists the item number of the item's first appearance in the Major Assembly Parts List.

9-18. GOVERNMENT STOCK NUMBER COLUMN. This column provides for government stock numbers which have been assigned to individual parts by SIGSU. Government stock numbers not presently included will, upon assignment, be included in future revisions of this manual.

9-19. QUANTITY PER KIT. If an item in the Numerical Parts List has been provided as part of the Equipment Repair Parts Kit, the quantity of each item supplied is listed in this column.

9-20. QUANTITY PER TRAINER. This column lists the total quantity of each part used in the trainer assembly.

9-21. REFERENCE SYMBOL NUMBER LIST. (See table 9-5.)

9-22. REFERENCE SYMBOL NUMBER COLUMN. This column lists, in alpha-numerical sequence, reference symbol numbers assigned to electrical parts which are used in the trainer assembly.

9-23. PART NUMBER COLUMN. This column lists the part number of each part which has been assigned a reference symbol number

9-24. ITEM NUMBER COLUMN. This column lists the item number of each reference symbol number and part as it appears on the Major Assembly Parts List.

9-25. HOW TO FIND A PART NUMBER.

9-26. If the reference symbol number is known, use the following procedure:

a. Turn to the Reference Symbol Number List.

b. Locate the reference symbol number in the first column for the particular part in question.

c. Cross-referenced against the reference symbol number is the part number and Item number as they appear in the Major Assembly Parts List.

9-27. HOW TO FIND THE DESCRIPTIONOF A PART.

9-28. If the part number is known, use the following procedure:

a. Locate the part number inthe Numerical Parts List.

b. Cross-referenced against the part number is the item number of the part as it appears on the Major Assembly Parts List.

c. When the item number has been determined as described in step *b*, turn to the Major Assembly Parts List.

d. Locate the item number in the Major Assembly Parts List. Cross-referenced to the item number will be found a description of the part in question.

9-29. HOW TO ORDER REPAIR PARTS.

9-30. Parts should be ordered according to applicable local procedures for Army Training Devices.

RADAR SIGNAL INTERFERNCE TRAINER (X-BAND)
DEVICE 15X12

TABLE 9-1 LIST OF MANUFACTURERS

CODE	MANUFACTURER	ADDRESS
	Jan Hardware Mfg. Corp.	Brooks, New York
	Mepoo Inc.	Morristown, New Jersey
	Rotating Components Inc.	Brooklyn, New York
AAEP	Augat Brothers Inc.	Attleboro, Massachusetts
AG	Agastat Div. of American Gas Accumulator Co.	Elizabeth, New Jersey
BBR	Birnbach Radio Co.	New York, New York
CGT	Cambridge Thermionic Corp.	Cambridge, Massachusetts
CLC	Camloc Fastener Corp.	Paramus, New Jersey
DABU	Dale Products Inc.	Columbus, Nebraska
EN	Elastic Stop Nut Corp.	Union, New Jersey
FLN	The Nylock Corp.	New York, New York
HALK	Halkey-Roberts Corp.	Paramus, New Jersey
HAW	Harvey Hubbell Inc.	Bridgeport, Connecticut
HBCO	Hubbell Corp.	Chicago, Illinois
MRQ	Minor Rubber Co., Inc.	Bloomfield, New Jersey
RAY	Raytheon Mfg. Co.	Waltham, Massachusetts
SH	Shakeproof Inc. Div. of Illinois Tool Works	Chicago, Illinois
SHHI	Herman H. Smith Inc.	Brooklyn, New York
SOCH	South Chester Corp.	Chater, Pennsylvania
TRII	Trimm Inc.	Libertyville, Illinois
TTE	Time Facsimile Corp.	New York, New York
TTM	Torrington Mfg. Co.	TorrIngton, Connecticut
ULC	George Ulanet Co.	Newark, New Jersey
VIEC	Victory Engineering Corp.	Newark, New Jersey
WIQ	Winchester Electronics Co.	Glenbrook, Connecticut
ZE	Zierick Mfg. Corp.	New Rochelle, New York

RADAR SIGNAL INTERFERENCE TRAINER CX-BAND) **DEVICE 15X12**

TABLE 9-2 LIST OF MAJOR ASSEMBLIES

MAJOR ASSEMBLY	REFERENCE SYMBOL SERIES	FIRST PAGE NO.
RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)		48
FRONT PANEL ASSEMBLY	101 to 299	49
KEYER CHASSIS	300	58
KLYSTRON TUBE MOUNT and WAVEGUIDE ASSEMBLY	301 to 599	64
AUDIO AMPLIFIER CHASSIS	100	68
MODULATOR CHASSIS	200	72
POWER SUPPLY CHASSIS	400	83

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TABLE 9-3 MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Radar Signal Interference Trainer (X-Band) - 101 - 399

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
1	1-1	TRAINER, RADAR SIGNAL INTERFERENCE X BAND, . DEVICE 15X12	D109975		
2	1-1	. COVER, TRANSIT CASE; aluminum, w/neoprene rubber bumpers and gasket per Spec ML-B-2765A overall dim. 19-23/32 in. fig by 13-25/32 in. wide by 2-15/16 in. deep	D113873		
3		. . STUD ASSEMBLY. TURNLOCK FASTENER; wing head stud, spring loaded, stainless steel, projects 19/32 in. from surface of material when closed			CLC 2600-4SW
4	1-1	. BOX ASSEMBLY. TRANSIT CASE; aluminum, w/neoprene rubber bumpers per Spec MIL-B-2765A. stenciled words "DEVICE 15X12,";over-all dim. 19-23/32 in. 14 by 13-25/32 in. wide by 18-5/16 in. deep	D113860		
5		. . VALVE, SAFETY RELIEF: nickel plated brass; supplied w/ attaching hardware; overall dim. when closed: 5/16 in. dia by 5/16 in. deep			HALK 209-AC
6		. . SEAL, RUBBER, ROUND SECTION: 0.562 ID, 0.750 OD		AN123866	
7	W701	. CABLE ASSEMBLY, RADIO FREQUENCY	B116390		
8	P309	. . CONNECTOR, PLUG, ELECTRICAL; series N (MIL-C-71A)		UG-21B/U	
9	P501	. . CONNECTOR, PLUG, ELECTRICAL; same as Item 8		UG-21B/U	
10		. . CABLE, RADIO FREQUENCY: polyethylene dielectric, 7 strands, silver plated copper		BG-9/U (MIL-C-17)	
11	W601	. CABLE ASSEMBLY, POWER, ELECTRICAL	B116397		
12	P406	. . CONNECTOR, PLUG, ELECTRICAL; 10 amp, 2 female contacts, w/cable clamp, overall dia. 1.375 in. dia by 2. 006			HAW 7506
13	P701	. . CONNECTOR, PLUG, ELECTRICAL; 10 amp, 2 male contacts blade type, polarized, w/cable clamp, overall dia. 1. 531 in. dia by 1.440 in. lg excluding blades			HAW 7547
14		. CABLE, POWER, ELECTRICAL: 2 wire; 16 AWG		CO-02MFF(2/16)SJ0375 (M1L -C- 3432A)	
15	HT101	HEADSET, ELECTRICAL; 600 ohm, 2-1/8 in. dia ear piece, adjustable steel headband			TRII 186

SERVICE NAME			CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)			N61339-29	15 x 12	Front Panel Assembly - 101 to 599
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
16	A801	. ANTENNA HORN ASSEMBLY	C107607		
17	J501	. . CONNECTOR, RECEPTACLE, ELECTRICAL; modified UG-58/U by adding An extension probe 0.312 in. lg of silver plated brass	A107612		
		ATTACHING PARTS			
18		. . SCREW, MACH; #4-40 thread		AN515-4-5	
19		. . WASHER, LOCK; #4		AN935-4L	
20	E801	. . ANTENNA, HORN; 356-T6 aluminum, overall dim. 2-11/32 in. lg by 1-27/32 in. high by 2-1/4 in. deep	B107609		
21		. DUST COVER ASSEMBLY; aluminum; box shape, overall dim. excluding louvres: 17-29/32 in. lg by 11-29/32 in. high by 13-19/32 in. deep	C111990		
		ATTACHING PARTS			
22		. SCREW, EXTERNALLY RELIEVED BODY: stainless steel; tapered shank 0.230 in dia under head to 0.176 in. dia at tip overall dim: 1/2 in. din slotted h by 0.611 in. lg shank			SOCH 12-11-205-12
23		. WASHER, LOCK: nickel silver, overall dim: 3/16 in. ID by 7/16 in. OD by 0.020 in. thk			SOCH 11014-11
24		. . STUD, TURNLOCK FASTENER: stainless steel w/nylon washer under head; slotted head; overall dim: 0.306 in. dim head by 7/16 in. lg shank			CLC 585-14
25		. . WASHER., SPLIT: spring steel; over-all dim: 5/16 in. ID by 0. 271 in. OD by 0.016 in. thk			CLC 583-1
26	1-1	. TRAINER, RADAR SIGNAL INTERFERENCE ASSEMBLY	D110178		
27	2-1	. . FRONT PANEL ASSEMBLY	D111748		
		ATTACHING PARTS			
28		. . SCREW, MACK; binding head, cadmium plated steel, 10-24 thread by 3/8 in.lg	A512476		
29		. . WASHER, LOCK; #10 *----------*		AN936B10	

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
30		. . . HANDLE, BOW; nickel plated brass w/two 10-32 internal taps 1/2 in. deep on 9 in. centers			CGT X2111-C-BO
		ATTACHING PARTS			
31		. . . SCREW, MACH; #10-32 thread		AN510-10-8	
32		. . . WASHER, LOCK; #10 *----------*		AN936C10	
33	2-1.4	. . . KNOB; bakelite, w/skirt, for use on 1/4 in. dia shafts, supplied w/attaching hardware, overall dim. 0. 928 in. dia by 1. 027 in. deep			RAY 90-3-2
34	2-1.3	. . . KNOB; bakelite, for use on 1/4 in. dia shafts, supplied w/ attaching hardware, overall dim. 0.938 in. dia by 0.803 in. deep			RAY 70-4-2
35	2-1.7	. . . KNOB; bakelite, w/skirt, for use on 1/4 in. dia shafts, supplied w/attaching hardware, overall dim. 1.269 in. dia by 1.088 in. deep			RAY 125-3-2
36	R230	. . . RESISTOR, VARIABLE, COMPOSITION; 2 sections; 5 megohms ±20%, 2 watts; taper symbol F; supplied w/attaching hardware; overall body dimexcluding terminals: 1-3/16 in. dia by 1-17/64 in. lg	B111027		
37	S201	. . . SWITCH, ROTARY; ceramic, one section, 2 poles, 3 positions, non-shorting type, overall dim: 1-5/8 in. dia by 2 in. lg by 1-7/8 in. high	D111995		
38	B399	. . . RESISTOR, FIXED, COMPOSITION; 1200 ohms ±10%, 2 watts		RC42GF122K (MIL-R-11B)	
39	M301	. . . AMMETER; dc		MR26W002DCMA (MIL -M -6A)	
40	S301	. . . SWITCH, ROTARY; ceramic, 4 sections, 2 poles per section, 5 positions, non-shorting type; overall dim: 1-5/8 in. dia by 2-31/32 in. lg by 1-7/8 in. high	D111994		
41	R278	. . . RESISTOR, VARIABLE, COMPOSITION; 100,000 ohms ±10%,2 watts		RV4NAVSD104A (MIL-R-94A)	
42	S302	. . . SWITCH, ROTARY; ceramic, 2 sections, 2 poles per section, 3 positions, shorting type, overall dim. 1-5/8 in. dia by 2-15/32 in. lg by 1-7/8 in. high	D111997		

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
43	R220	. . . RESISTOR, VARIABLE, COMPOSITION; 3 sections, section A and B data: 5 megohm ±20%, 2 watts, taper symbol F, section C data: 50,000 ohms ±10%, 2 watts, taper symbol A, supplied w/attaching hardware, over-all body dim. excluding terminals: 1-3/16 in. dia by 1-53/64 in. lg	B113113		
44	R315	. . . RESISTOR, VARIABLE, COMPOSITION; 2 sections, section A data: 500,000 ohms ±10%, 2 watts, taper symbol A; section B data: 50,000 ohms ±10%, 2 watts, taper symbol A; supplied w/attaching hardware, over-all body dim. excluding terminals: 1-5/32 in. dia by 1-17/64 in. lg	B112009		
45	R214	. . . RESISTOR, VARIABLE, COMPOSITION, 2 sections, 25,000 ohms ±10%, 2 watts, taper symbol A, supplied w/attaching hardware, overall body dim. excluding terminals: 1-5/32 in. dia by 1-17/64 in. lg	B111992		
46	R115	. . . RESISTOR, VARIABLE, COMPOSITION; 500,000 ohms ±10%, 2 watts		RV4NAVSD504A (MIL-R-94A)	
47	S303	. . . SWITCH, ROTARY; ceramic, one section, 3 poles, 2 positions, non-shorting type, over-all dim: 1-5/8 in. dia by 2 In. lg by 1-7/8 in. high	D111998		
48	J406	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; 2 female contacts, polarized, 2 mounting holes 0.146 in. dia on 1-11/16 In. centers, over-all dim. 2-/32 in. dia by 1. 375 in. deep			HBCO 7524
		ATTACHING PARTS			
49		. . . SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 3/8 in. lg	A512446		
50		. . . WASHER, LOCK; #6		AN936B6	
51		. . . NUT, HEX; #6-32 thread		AN340-6	
		* - - - - - - - - - *			
52	F401	. . . FUSE, CARTRIDGE; 3 amp		FO3G3R00B (MIL-F-15160C)	
53	F402	. . . FUSE, CARTRIDGE; same as item 52			
54	F403	. . . FUSE, CARTRIDGE; same as item 52			
55	F404	. . . FUSE, CARTRIDGE; same as item 52			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
56	F405	. . . FUSE, CARTRIDGE; same as item 52			
57	F406	. . . FUSE, CARTRIDGE; same as item 52			
58	XF401	. . . FUSEHOLDER; extractor post type		FHN20G(MIL-F-19207)	
59	XF402	. . . FUSEHOLDER; same as item 58			
60	XF403	. . . FUSEHOLDER; same as item 58			
61	XF404	. . . FUSEHOLDER; same as item 58			
62	XF405	. . . FUSEHOLDER; same as item 56			
63	XF406	. . . FUSEBOLDER; same as item 58			
64	2-1.19	. . . PLATE, IDENTIFICATION; 15X12		GFP	
		ATTACHING PARTS			
65		. . . SCREW, DRIVE; #2-56 thread		AN535-2-2	
		* - - - - - - - - - *			
66	S401	. . . SWITCH, ROTARY; ceramic, 1 section, 3 poles, 3 positions. shorting type, over-all dim. 1-5/8 in. dia by 2 in. lg by 1-7/8 in. high	D111996		
67	DS401	. . . LAMP, INCANDESCENT, 6V		MS15671-2	
68	DS402	. . . LAMP, GLOW; neon filled		NE-51 (MIL-L-15098B)	
69	XDS401	. . . LIGHT, INDICATOR; red faceted Jewel, stove pipe shape		LH50PRS (MIL-L-3661)	
70	XD6402	. . . LIGHT, INDICATOR; amber plain Jewel, stovepipe shape		LH64PA5 (MIL-L-3661)	
71	2-1.16	. . . COVER, TELEPHONE JACK; enamel painted CRES, w/ spring,, max over-all dim.: 1-3/32 in. g by 13/16 in. dia of cover by 11/32 in. high			JAN HAIRWARE MFG CORP. J1301-3
72	J102	. . . JACK, TELEPHONE; 3/8 in. dia bushing mounted, switching action: opens one		JJ-089 (MIL-J-641A)	
73	J306	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; BNC, non-constant impedance type		UG-625A/U (MIL-C-3608)	
74		. . . CLAMP, CABLE; nylon,. 0.422 in. dia max cable size accommodated	B517506		

SERVICE NAME		CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)		N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
					ATTACHING
PARTS					
75		. . . SCREW, MACH; same as item 49			
76		. . . WASHER, LOCK; same as item 50			
77		. . . WASHER, FLAT; cadmium plated steel, 0.149 in. ID, 0.357 in. OD, 0.32 in. thk	A503613		
78		. . . NUT, HEX; same as item 51			
					*- - - - - - - - - *
79	W201	. . . CABLE ASSEMBLY, RADIO FREQUENCY	B112008-4		
80	E212	. . . . TERMINAL, FEEDTHRU; and seal series, not weather-proof (dwg No. REB49142)		MX-1530/U	
81	P203	. . . . CONNECTOR, PLUG, ELECTRICAL; BNC 50 ohm constant impedance		UG-260B/U (MIL-C-3608)	
82		. . . . CABLE, RADIO FREQUENCY; semisolid polyethylene dielectric, two 22 AWG copperweld conductors		RG-62/U (MIL-C-17)	
83	W202	. . . CABLE ASSEMBLY, RADIO FREQUENCY	B112008-3		
84	E213	. . . . TERMINAL, FEEDTHRU; same as item 80			
85	P202	. . . . CONNECTOR, PLUG, ELECTRICAL; same as item 81			
86		. . . . CABLE, RADIO FREQUENCY; same as item 82			
87	W303	. . . CABLE ASSEMBLY, RADIO FREQUENCY	B112008-2		
88	E307	. . . . TERMINAL, FEEDTHRU; same as item 80			
89	P304	. . . . CONNECTOR, PLUG, ELECTRICAL; same as item 81			
90	.	. . . . CABLE, RADIO FREQUENCY; same as item 82			
91	W304	. . . CABLE ASSEMBLY, RADIO FREQUENCY	B112008-1		
92	E308	. . . . TERMINAL, FEEDTHRU; same as item 80			
93	P305	. . . . CONNECTOR, PLUG, ELECTRICAL; same as item 81			
94		. . . . CABLE, RADIO FREQUENCY; same as item 83			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
95		. . . BRACKET, ANGLE; iridited aluminum, L shape, overall dim.: 2-1/8 in lg by 1-7/8 in. wide by 5/8 in. deep	B113114		
96		. . . BRACKET. ANGLE; iridited aluminum, modified L shape, over-all dim.: 1-3/4 in. lg by ,1-11/16 wide by 5/8 in. deep	B113115		
					ATTACHING
PARTS					
97	.	. . . SCREW, MACH; same as item 49			
98		. . . WASHER, LOCK; same as item 50			
99		. . . NUT, HEX;. same as item 81			
					*- - - - - - - - - *
100	W301	. . . CABLE ASSEMBLY, RADIO FREQUENCY	B111985		
101	J309	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; series N, 50 ohm constant impedance		UG-160B/U (MIL-C-71A)	
102	P310	. . . . CONNECTOR, PLUG, ELECTRICAL; same as item 8			
103		. . . . CABLE. RADIO FREQUENCY; same as item 10			
104		. . . CLAMP, CABLE; same as item 74			
					ATTACHNG
PARTS					
105		. . . SCREW, MACH; same as item 49			
106		. . . WASHER, LOCK same as item 50			
107		. . . WASHER, FLAT; same as item 77			
108		. . . NUT, HEX; same as item 61			
					*- - - - - - - - - *
109	P403	. . . CONNECTOR, PLUG, ELECTRICAL; 20 male contacts, polarized		MS24014	
110		. . . SHIELD, ELECTRICAL CONNECTOR; aluminum. w/cable clamp, 7/16 in. dia cable also accommodated, overall dim. Excluding cable clamp: 1-1/32 in. lg by 1-5/16 in. wide by 1/2 in. deep			WIQ MRE 20H
111	A304	. . . BRACKET ASSEMBLY, FRONT PANEL	C111987		

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Front Panel Assembly - 101 to 599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
					ATTACHING
PARTS					
112		. . .·SCREW, MACH; same as item 49			
113		. . .·WASHER, LOCK; same as item 50			
					*- - - - - - - - - *
114	J301	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; 41 female pins		MS24023	
					ATTACHING
PARTS					
115		. . . . WASHER, LOCK; #4		AN936B4	
					*- - - - - - - - - *
116	J201	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; 34 female pins		MS24021	
					ATTACHING
PARTS					
117		. . . . WASHER, LOCK; same as item 115			
					*- - - - - - - - - *
118	J101	. . . . CONNECTOR. RECEPTACLE, ELECTRICAL; 14 female pins		MS24009	
					ATTACHING
PARTS					
119		. . . . WASHER, LOCK; same as item 115			
					*- - - - - - - - - *
120	J360	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 73			
121		. . . . GROMMET, RUBBER; 3/4 in. ID		AN931-12-17 (MIL-G-3036)	
122		. . . . TERMINAL LUG; hot tin dipped phosphor, mounts by #6 screw size hole, over-all length 41/64 in.			SH 210406-00
123	A501	. . . . TERMINAL BOARD ASSEMBLY	B111756		
					ATTACHING
PARTS					
124		. . . . SCREW, MACH; same as item 49			
125		. . . . WASHER, FLAT; same as item 77			
126		. . . . WASHER, LOCK; same as item 50			
					*- - - - - - - - - *

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
127	C304	. . . . . CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 200 vdc		CP05AEC104K (MIL-C-25A)	
128	R330	. . . . . RESISTOR, FIXED, COMPOSITION; 100,000 ohms ±10%, 1/2 watt		RC20GF104K (MIL-R-11B)	
129	TB501	. . . . . TERMINAL BOARD;, phenolic material, 20 terminals included and accommodated, over-all dim.: 3-1/8 in. lg by 1-3/16 in. wide by 1/8 in. thk	B111755		
130		. . . . BRACKET; iridited aluminum, triangular shape, over-all dim.: 4-5/32 in. lg by 2-5/8 in. high by 3 13/16 in. deep	C112007		
131		. . .· PANEL; zinc chromate finished aluminum w/face painted olive drab, overall dim.: 17-3/4 in. lg by 11 43/64 in. wide by 1/8 in. thk	D111993		
132	10-9	. .KEYER CHASSIS	D110317		
		ATTACHING PARTS			
133		. .SCREW, MACH; binding head, cadmium plated steel, 8-32 NC-2 by 3/8 in. lg	A512461		
134		. .WASHER, LOCK; #8		AN936B8	
135	A302	. . .· SHAFT LOCK ASSEMBLY	AK5100		
136		. . . . NUT, LOCK; nickel plated brass, 7/16 in. hex stock, 3/8-32 NEF-2 thread	AP15297		
137		. . . . BUSHING-SHAFT, PANEL; nickel plated brass, 3/8-32 NEF-2 internal thread 11/64 in. deep, 3/8-32 NEF-2 external thread 1/4 in. lg at opposite end, hex head, 4 slots 1/32 in. wide by 1/4 in. deep, over-all dim.: 1/2 in. lg by 1/2 in. across flats	AP15342		
138	R302	. . .· RESISTOR, VARIABLE, COMPOSITION; same as item 46			
139	R353	. . .· RESISTOR, VARIABLE, COMPOSITION 10,000 ohms ±10%, 2 watts		RV4NAV13D103A (MIL-R-94A)	
140	R335	. . .· RESISTOR, VARIABLE, COMPOSITION; 1 megohm ±10%, 2 watts		RV4NAVSD105A (MIL-R-94A)	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
141	R323	. . . RESISTOR, VARIABLE, COMPOSITION; same as item 46			
142	R313	. . . RESISTOR, VARIABLE, COMPOSITION; 50,000 ohms ±10%., 2 watts.		RV4NAVSD503A (MIL-R-94A)	
143	R317	. . . RESISTOR, VARIABLE; same as item 142			
144	R307	. . . RESISTOR, VARIABLE; same as item 140			
		ATTACHING PARTS			
145		. . . WASHER, LOCK; #3/8		AN936A616	
144		. . . WASHER, LOCK; cadmium plated bronze, 3/8 in. ID, 0.692 in. OD, 0.035 in. thk	A520827		
					*- - - - - - - - - *
147		. . . CLAMP, CABLE; nylon, 5/8 in. dia max size of cable accommodated	B517518		
		ATTACHING PARTS			
148		. . . SCREW, MACH: binding head, cadmium plated steel, 6-32 NC-2 thread, 7/16 in. lg.	A512447		
149		. . . WASHER. LOCK; same as item 5			
150		. . . WASHER, FLAT; same as item 77			
151		. . . NUT. HEX; same as item 51			
					*- - - - - - - - - *
152	P301	. . . CONNECTOR. PLUG, ELECTRICAL; 41 male contacts		MS24034	
153		. . . SHIELD, ELECTRICAL CONNECTOR; aluminum, w/cable clamp, 11/16 in. dia max cable accommodated, over-all dim. excluding cable clamp 1-17/32 in. lg by 2-5/8 in. wide by 1/2 in. deep			WIQ MRE 41H
154		. . . GROMMET; same as item 121			
155	J305	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; BNC, 1 female contact		UG-1094/U (MIL-C-3608)	
156	J302	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 155			
157	J304	. . . CONNECTOR. RECEPTACLE, ELECTRICAL same as item 155			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
158	C303	. . . CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±20%, 600 vdc		CP05A1EF104M (MIL-C-25A)	
159		. . . POST, TERMINAL; melamine body, silver plated brass terminals, over-all dim.: 9/16 in. lg by 1/4 in across flat	A523203		
					ATTACHING
PARTS					
160		. . . SCREW, MACH; binding head, cadmium plated steel; 4-40 NC-2 thread 3/8 in. lg	A512424		
161		. . . WASHER, LOCK; same as item 115			
					* - - - - - - - - - *
162	J303	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; 7 female pins, w/lockring, supplied w/attaching hardware,over-all dim.: 23/32 in die by 17/32 in. deep			WIQ M7S-LRN
163	A303	. . . SHAFT LOCK ASSEMBLY; same as item 135			
164		. . . NUT, LOCK; same as item 136			
165		. . . BUSHING SHAFT, PANEL; same as item 137			
166	R358	. . . RESISTOR, VARIABLE, COMPOSITION; 250 ohm ±10%, 2 watt		RV4NAVSD251A	(MIL-R-94A)
					ATTACHING
PARTS					
167		. . . WASHER, LOCK; same as item 145			
168		. . . WASHER, LOCK; same as item 146			
					* - - - - - - - - - *
169	R359	. . . RESISTOR, FIXED, FILM; carbon film; hermetically sealed, 90,900 ohms, 1/2 watt, over-all body dim.: 0.640 in. lg by 0.244 in. dia			Mepoo Co. Inc. C-173A
170	R360	. . . RESISTOR., FIXED, FILM; carbon film; hermetically sealed 200,000 ohms, 1/2 watt, over-all body dim.: 0.825 in. lg by 1/4 in. dia			Mepoo Co. Inc. C-173B
171	R345	. . . RESISTOR, FIXED, COMPOSITION; 2 megohmn ±5%, 1/2 watt		RC20GF205J	(MIL-R-11B)
172	C314	. . . CAPACITOR, FIXED, CERAMIC DIELECTRIC; 10,000 uuf +100% -20%, 500 vdc		CK63Y103Z (MIL-C-11015A)	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
173	R327	. . . RESISTOR, FIXED, FILM; 600,000 ohms ±5%, 1 watt		RN25X6003J (MIL-R-10509B)	
174	E306	. . . SHIELD, ELECTRON TUBE	TS102U02 (JAN-S-28A)		
175	E303	. . . SHIELD, ELECTRON TUBE; same as item 174			
176	E304	. . . SHIELD, ELECTRON TUBE	TS103U02 (JAN -S-28A)		
177	E305	. . . SHIELD, ELECTRON TUBE; same as item 174			
178	E302	. . . SHIELD, ELECTRON TUBE; same as item 174			
179	E301	. . . SHIELD, ELECTRON TUBE; same as item 174			
180	V306	. . . ELECTRON TUBE		6100/6C4WA (MIL-E-1)	
181	V303	. . . ELECTRON TUBE; same as item 180			
182	V304	. . . ELECTRON TUBE		12AT7WA (MIL-E-1)	
183	V305	. . . ELECTRON TUBE		6AU6WA (MIL-E-1)	
184	V302	. . . ELECTRON TUBE; same as item 183			
185	V301	. . . ELECTRON TUBE; same as item 180			
186	XV306	. . . SOCKET, ELECTRON TUBE; 7 pin		TS102P01 (JAN-S-28A)	
187	XV303	. . . SOCKET, ELECTRON TUBE; same as item 186			
188	XV304	. . . SOCKET, ELECTRON TUBE; 9 pin		TS103P01 (JAN-S-28A)	
189	XV305	. . . SOCKET, ELECTRON TUBE; same as item 186			
190	XV302	. . . SOCKET, ELECTRON TUBE; same as item 186			
191	XV301	. . . SOCKET, ELECTRON TUBE; same as item 186			
192		. . . STRAP, RETAINER; cadmium plated brass, two holes 4-40 NC-2 threaded on 0.875 in. centers, overall dim.: 1-1/8 in. lg by 3/8 in. high	AK5168		
193		. . . STRAP, RETAINER; cadmium plated brass, two holes 4-40 NC-2 threaded on 1-1/8 in. centers, overall dim.: 1-11/32 in. lg by 3/8 in. High	AK5169		

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
		ATTACHING PARTS			
194		. . . SCREW, MACH; binding bead, cadmium plated steel, 4-40 NC -2 thread by 1/4 in. lg	A512422		
195		. . . WASHER, LOCK; same as item 115			*- - - - - - - - - *
196		. . . POST. TERMINAL; same as item 159			
		ATTACHING PARTS			
197		. . . SCREW, MACH; same as item 160			
198		. . . WASHER, LOCK; same as item 115			*- - - - - - - - - *
199	J316	. . . JACK, TIP, low voltage		MS16108-2	
200	J307	. . . JACK, TIP, same as item 19			
201	A301	. . . TERMINAL BOARD ASSEMBLY	C110327		
		ATTACHING PARTS			
202		. . . SCREW, MACH; same as item 49			
203		. . . WASHER, FLAT; nickel plated brass, 0.145 in. ID, 516 in. OD, 1/32 in. thk			BBR 6480A
204		. . . WASHER, FLAT; same as item 77			*- - - - - - - - - *
205	R357	. . . . REISTOR, FIXED, COMPOSITION; 750 ohms ±5%, 1 watt		RC32GF751J (MIL-R-11B)	
206	R320	. . . . RESISTOR, FIXED, COMPOSITION; 1 megohm ±10%. 1/2 watt		RC20GF105K (MIL-R-11B)	
207	R329	. . . . RESISTOR, FIXED, COMPOSITION; 2. 7 megohms ±10%, 1/2 watt		RC20GF275K (MIL-R-11B)	
208	B328	. . . . RESISTOR, FIXED, COMPOSITION; 2.4 megohms ±10%, 1/2 watt		RC20GF245K (MIL-R-11B)	
209	R301	. . . . RESISTOR, FIXED, COMPOSITION; 68,000 ohms ±10%, 1/2 watt		RC20GF683K (MIL-R-11B)	
210	C312	. . . . CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
211	R343	. . . . RESISTOR, FIXED, COMPOSITION; 1.2 megohms ±5%, 1/2 watt		RC20GF125J (MIL-R-11B)	
212	R344	. . . . RESISTOR, FIXED, COMPOSITION; 6,800 ohms ±5%, 2 watt		RC42GF682J (MIL-R-11B)	
213	R342	. . . . RESISTOR, FIXED, COMPOSITION; 820,000 ±5%, 1/2 watt		RC20GF824J (MIL-R-11B)	
214	C311	. . . . CAPACITOR, FIXED, MICA DIELECTRIC; 68 uuf ±5%, 500 vdc		CM20B680J (MIL-C-5A)	
215	C309	. . . . CAPACITOR, VARIABLE, CERAMIC DILECTRIC; 45 uuf max, 500 vdc		CV11C450 (MIL-C-81A)	
		ATTACHING PARTS			
216		. . . . SCREW, MACH; bind bead, cadmium plated steel, 4-40 NC-2 by 3/4 in. lg	A512428		
217		. . . . WASHER, LOCK; same as item 115			
218		. . . . WASHER, NONMETALIC; fibre, 0.110 in ID, 1/4 in. OD, 1/16 in. thk			SHHI 2161
219		. . . . NUT, HEX; 4-40 NC-2 thread		AN340-4	*- - - - - - - - - *
220	R305	. . . . RESISTOR, FIXED, COMPOSITION; 12,000 ohm. ±10%, 1/2 watt		RC20GF123K (MIL-R-11B)	
221	R304	. . . . RESISTOR, FIXED, COMPOSITION; same as item 220			
222	R303	. . . . RESISTOR, FIXED, COMPOSITION; 18,000 ohm. ±10%, 1/2 watt		RC20GF183K (MIL-R-11B)	
223	R356	. . . . RESISTOR, FIXED, COMPOSITION; 51,000 ohm ±10%, 2 watt		RC42GF513K (MIL-R-11B)	
224	R352	. . . . RESISTOR, FIXED, COMPOSITION; 100,000 ohms ±10%, 2 watt		RC42GF104K (MIL-R-11B)	
225	R348	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
226	R347	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
227	R346	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
228	R354	. . . . RESISTOR, FIXED, COMPOSITION; 1.1 megohm ±5%, 1/2 watt		RC20GF115J (MIL-R-11B)	
229	R350	. . . . RESISTOR, FIXED, FILM; 100,000 ohms ±5%, 1/2 watt, over-all body dim.: 11/64 in. dia by 19/32 in. lg	B116392		
230	R319	. . . . RESISTOR, FIXED, COMPOSITION; 220,000 ohms ±10%, 1/2 watt		RC20GF224K (MIL-R-11B)	
231	R324	. . . . RESISTOR, FIXED, COMPOSITION; 180,000 ohms ±10%, 1/2 watt		RC20GF184K (MIL-R-11B)	
232	R322	. . . . RESISTOR, FIXED, COMPOSITION; 360,000 ohms ±5%, 1/2 watt		RC20GF364J (MIL-R-11B)	
233	R326	. . . . RESISTOR, FIXED, COMPOSITION; 62,000 ohms ±5%, 1 watt		RC32GF623J (MIL-R-11B)	
234	R314	. . . . RESISTOR, FIXED, COMPOSITION; 68,000 ohms ±10%, 2 watts		RC42GF683K (MIL-R-11B)	
235	R325	. . . . RESISTOR, FIXED, COMPOSITION; same as item 231			
236	R312	. . . . RESISTOR, FIXED, COMPOSITION; same as item 234			
237	R337	. . . . RESISTOR, FIXED, COMPOSITION; 47,000 ohms ±10%, 2 watt		RC42GF473K (MIL-R-11B)	
238	R336	. . . . RESISTOR, FIXED, COMPOSITION; same as item 237			
239	R316	. . . . RESISTOR, FIXED, COMPOSITION; 20,000 ohms ±5%, 1/2 watt		RC20GF203J (MIL-R-11B)	
240	C308	. . . . CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172			
241	R318	. . . . RESISTOR, FIXED, COMPOSITION; 10,000 ohms ±5%, 1/2 watt		RC20GF103J (MIL -R-11B)	
242	R339	. . . . RESISTOR, FIXED, COMPOSITION; 47 ohms ±5%. 1/2 watt		RC20GF470J (MIL-R-11B)	
243	R306	. . . . RESISTOR, FIXED, COMPOSITION; 82,000 ohms +10%, 1/2 watt		RC20GF823K (MIL-R-11B)	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Keyer Chassis - 300

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
244	R309	. . . . RESISTOR, FIXED, COMPOSITNON; 51,000 ohms ±5%, 1/2 watt		RC20GF513J (MIL-R-11B)	
245	R310	. . . . RESISTOR, FIXED, COMPOSITION; same as item 244			
246	R306	. . . . RESISTOR, FIXED, COMPOSITION; same as item 230			
247	R336	. . . . RESISTOR, FIXED, COMPOSITION; 100 ohms ±10%, 1/2 watt		RC20GF101K (MIL-R-11B)	
248	R340	. . . . RESISTOR, FIXED, COMPOSITION; same as item 206			
249	CR302	. . . . SEMICONDUCTOR DEVICE, DIODE; germanium crystal rectifier		1N69 (MIL-E-1)	
250	CR301	. . . . SEMICONDUCTOR DEVICE, DIODE; same as item 249			
251	TB301	. . . . TERMINAL BOARD; phenolic, w/66 turret lugs, 4 electrical clips, over-all dim. 7-3/8 in. lg by 2-7/8 in. wide by 1/8 in. thk	B111758		
252	C301	. . CAPACITOR, FIXED, PAPER DIELECTRIC; 4 uf ±10%, 600 vdc		CP41B1FF405K (MIL-C -25A)	
253	C302	. . . CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 252			
254		. . . BRACKET ASSEMBLY	B110305		
		ATTACHING PARTS			
255		. . . SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 by 3/16 in. lg	A512443		
256		. . . WASHER, LOCK; same as item 50			
257		. . . CHASIS, KEYER; aluminum, caustic etched and iridite finish, w/permanently afixed hardwre, over-all dim.: 12-7/32 in. lg by 4-3/32 in. wide by 2-25/32 in. high	C110539		*- - - - - - - - - *
258	W302	. . CABLE ASSEMBLY, RADIO FREQUENCY	B111986		
259	P306	. . . CONNECTOR, PLUG, ELECTRICAL; same as item 81			
260	P312	. . . CONNECTOR, PLUG, ELECTRICAL; UHF, (dwg No. RE49F471A)		UG-203/U	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Klystron Tube Mount & Waveguide Assb. 301-599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
261		. . . CABLE, RADIO FREQUENCY; polyethylene dielectric, two wire, 22 AWG, copper plated steel		RG-71/U (MIL-C-17)	
262	10-15	. . KLYSTRON TUBE MOUNT and WAVEGUIDE ASSEMBLY	C107638		
		ATTACHING PARTS			
263		. . SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 5/16 in. lg	A512445		
264		. . WASHER, LOCK; same as item 50			

265	10-15	. . . KLYSTRON TUBE MOUNT ASSEMBLY	C112182		
		ATTACHING PARTS			
266		. . . SCREW, MACH; 08-32 thread		AN 500-8-12	
267		. . . WASHER, LOCK; #8		AN935-8L	
268		. . . NUT, HEX; 08-32 thread		AN340-8	

269	10-15	. . . . TUBE COVER ASSY	C115991		
270		. . . . . SHIELD, ELECTRICAL CONNECTOR; w/cable clamp, 5/32 in. dia clamp opening, over-all dim. excluding cable clamp: 9/16 in. dia by 11/16 in. lg			WIQ H10C
271	P405	. . . . . CONNECTOR PLUG, ELECTRICAL; 4 male pins, w/lock spring, over-all dim.: 15/32 in. dia by 5/8 in. deep			WIQ M4P-LS
272	HR401	. . . . . HEATER, SPACE, ELECTRIC; 115v, 50 watts, over-all dim. excluding leads: 3/8 in. dia by 1-1/2 in. lg	B115985		
273		. . . . . CLIP, CARTRIDGE; cadmium plated steel,over-all dim.: 1.187 in. lg by 0. 425 in. wide by 0. 490 in. high			AAEP 6002-1A
		ATTACHING PARTS			
274		. . . . . SCREW, MACH; same as item 160			
275		. . . . . WASHER, LOCK; cadmium plated spring steel, split type, over-all dim.: 0. 212 in. dia OD by 0.112 in. ID by 0. 025 in. thk	A515902		

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Klystron Tube Mount & Waveguide Assb. 301-599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
276		. . . . . WASHER, FLAT; cadmium plated steel, 0.149 in. ID, 0. 375 in. OD, 0. 016 in. thk	A503603		
277		. . . . . NUT, HEX; cadmium plated steel 4-40 NC-2 thread	A502823		*- - - - - - - - - *
278	S403	. . . . . SWITCH, THERMOSTATIC; 5 amp, -60 deg C to +100 deg C range, over-all dim.: 1-1/4 in. lg by 3/4 in. wide by 7/16 in. high			ULC 13
		ATTACHING PARTS			
279		. . . . . SCREW, MACH; binding head, cadmium plated steel, 4-40 NC-2 thread by 7/8 in. lg	A512429		
280		. . . . . WASHER, LOCK; same as item 275			
281		. . . . . WASHER, FLAT; same as item 276			
282		. . . . . NUT, HEX; same as item 277			*- - - - - - - - - *
283		. . . . . PO. ST, MOUNTING; 2024-T4 aluminum, anodized finish, over-all dim.: 3/16 in. dia by 5/8 in. lg, w/0. 110 in. dia thru hole	B115986		
284		. . . . . PST, TERMINAL; nickel plated brass, ceramic insulation, over-all dim.: 5/16 n. dia by 25/32 in. lg			CGT X-1942-X
		ATTACHING PARTS			
285		. . . . . WASHER, FLAT. same as item 276			
286	.	. . . . . NUT, HEX; cadmium plated steel, 6-32 NC-2 thread	A502825		*- - - - - - - - - *
287		. . . . . GROMMET; natural rubber, over-all dim.: 1/4 in. ID by 7/16 in. OD by 3/8 in. thk			MRQ U2463
288	N401	. . . . . PLATE, INSTRUCTION; red and yellow letters w/black enamel background, inscribed "WARNING HIGH TEMPERATURE", over-all dim.: 2 in. lg by I in. high by 1/16 in. thk	B116741		
		ATTACHING PARTS			
289		. . . . . SCREW, MACH; cadmium plated steel, 4-40 NC-2 thread 5/16 in. lg	A512423		

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Klystron Tube Mount & Waveguide Assb. 301-599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
290		. . . . . WASHER, LOCK; cadmium plated steel, 0.116 in. ID, 0.270 in. OD, 0.016 in. thk	A520803		
291		. . . . . WASHER, FLAT; same as item 276			
292		. . . . . NUT, HEX; same as item 277			*- - - - - - - - - *
293		. . . . . INSULATION, BLANKET, THERMAL; bonded white fiber, over-all dim.: 8 in. lg by 3-1/32 in. wide by 0.20 thk	C115990		
294		. . . . . COVER, TUBE; cadmium plated steel, over-all dim.: 3-3/32 in. dia by 3-3/4 in. high w/clamping device attached	B111738		
295	P302	. . . . CONNECTOR PLUG, ELECTRICAL; same as item 81			
296		. . . . SHIELD, ELECTRICAL CONNECTOR; w/cable clamp, 19/64 in. dia cable opening, over-all dim.: 21/32 in. dia by 21/32 in. lg excluding clamp			WIQ H19C
297	P303	. . . . CONNECTOR, PLUG, ELECTRICAL; 7 male pins, w/lock spring, over-all dim.: 25/32 in. dia by 17/32 in. deep			WIQ M7P-LS
298		. . . . CLAMP, RIM CLENCHING; nylon, over-all dim.: 1/2 in. dia by 43/64 in. lg	B111742		
		ATTACHING PARTS			
299		. . . . SCREW, SELF-LOCKING; cadmium plated steel, 4-40 NC-2 thread, 7/8 in lg			FLN M36BS440-14CR *- - - - - - - - - *
300	V307	. . . . ELECTRON TUBE		2K45 (MIL-E-1)	
301	XV307	. . . . SOCKET, ELECTRON TUBE; 8 female pins, modified from AMP part No. 78-S8 by drilling an 0.156 in. dia hole thru the #4 pin	B116396		
302		. . . . PLATE, TUBE MOUNTING; silver plated brass, over-all dim.: 3. 046 in. dia by 0. 091 in. thk	B116407		
		ATTACHING PARTS			
303		. . . . SCREW, MACH; #2-56 thread		AN500A2-5	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Klystron Tube Mount & Waveguide Assb. 301-599

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
304		. . . . WASHER, LOCK; #2		AN935-2	
305		. . . . PIN, STRAIGHT, HEADLESS; stainless steel, over-all dim.: 0.62 in. dia by 1/4 in. lg			AG 52-012-062-0250
306		. . . . GROMMET; rubber		AN931A7-11 (MIL -G-36)	
307		. . . . INSULATOR, THERMAL; are resistant plastic, bowl shape, overall dim.: 31/32 in. dia by 0.225 in. high	B111735		
308	E311	. . . . COVER, CHOKE; brass, over-all dim.: 27/32 in. dia by 0.195 in. high	B111744		
309	E312	. . . . INSULATOR, RADIO FREQUENCY; T shaped plastic, over-all dim.: 0.734 in. dia by 21/64 in. lg	B111736		
310		. . . . HOUSING, KLYSTRON TUBE MOUNT; caustic etch and iridited aluminum alloy, over-all dim.: 4-1/8 in. lg by 2 in. high	D111746		
311	CR501	. . . SEMICONDUCTOR DEVICE, DIODE		1N23C (MIL-E-1)	
312	XCR501	. . . CRYSTAL HOLDER, COAXIAL; incorporates type N input connector (Ref Symbol J312) and output connector (Ref Symbol P311) (Sig Corps dwg No. SC-D-12024D)		UG-119/UP	
313	10-15	. . . WAVEGUIDE ASSEMBLY	B107626		
314	A305	. . . . CONNECTOR ASSEMBLY	B107624		
315	J311	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; modified UG-58/U by turning down flange to 0. 875 in. dia and cutting probe 0.042 in. lg then silver plating cut portions	B107623		
316		. . . . RETAINER, CONNECTOR 2024-T4 aluminum, over-all dim.: 1-1/4 in. by 1-1/4 in.	A107625		
		ATTACHING PARTS			
317		. . . . SCREW, MACH; 440 thread		AN515C4-4	
318		. . . . WASHER, SPLIT; same as item 275			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Audio Amplifier Chassis -100

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
319	J310	. . . . CONNECTOR, RECEPTACLE, ELECTRICAL; same as Item 17			
		ATTACHING PARTS			
320		. . . . SCREW, MACH; same as item 317			
321		. . . . WASHER, SPLIT; same an item 275			

322	W305	. . . . WAVEGUIDE; 356-T6 aluminum, over-all dim.: 4-5-16 in. lg by 1-5/8 in. wide by 1-5/8 in. high	B116408		
323	10-10	. . AUDIO AMPLIFIER CHASSIS	D109800		
		ATTACHING PARTS			
324		. . SCREW, MACH; same as item 133			
325		. . WASHER, LOCK;- same as item 134			

326	A101	. . . . TERMINAL BO ASSEMBLY	B109806		
		ATTACHING PARTS			
327		. . . . SCREW, MACH; same as item 49			
328		. . . . WASHER, LOCK;same as item 50			
329		. . . . WASHER, FLAT; same as item 77			

330	R103	. . . . RESISTOR FIXED, COMPOSITION; 75,000 ohms ±10%, 1/2 watt		RC20GF753K (MIL-R-11B)	
331	R104	. . . . RESISTOR, FIXED, COMPOSITION; 270 ohms ±10% I watt		RC33GF271K (MIL-R-11B)	
332	C104	. . . . CAPACITOR, FIXED. MICA DIELECTRIC; 100 uuf ±10%, 500 vdc		CM20B101K) (MIL-C-5A)	
333	R105	. . . . RESISTOR, FIXED COMPOSITION; same item 330			
334	R106	. . . . RESISTOR, FIXED, COMPOSITION; 22,000 ohm ±10%. 1/2 watt		BC20GF223K (MIL-R-11B)	
335	R107	. . . . RESISTOR, FIXED, COMPOSITION; 180 ohms ±10%. 2 watts		RC42GF181K (MIL-R-11B)	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Audio Amplifier Chassis - 100

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
336	C107	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; 10,000 uuf ±10%. 300 vdc		CM35B103K (MIL-C-SA)
337	R108	. . . .	RESISTOR, FIXED, COMPOSITION; 47,000 ohms ±10%, 1/2 watt		RC20GF473K (MIL-R-11B)
338	R109	. . . .	RESISTOR, FIXED, COMPOSITION; 10,000 ohms ±10%, 2 watts		RC42GF103K (MIL-R-11B)
339	R111	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 331		
340	CR101	. . . .	SEMICONDUCTOR DEVICE, DIODE		1N126 (MIL-E-1)
341	C108	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 332		
342	T102	. . . .	TERMINAL BOARD; phenolic, w/28 turret lugs, overall dim. 6-13/16 in.lg by 1-3/4 in. wide by 1/8 in. thk		B109807
343	R110	. . .RESISTOR, FIXED, WIREWOUND, 10 ohms, 15 watts		RW20G392 (MIL-R-26)	
PARTS					ATTACHING
344		. . .SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 3/4 in. lg	A512450		
345		. . . WASHER, FLAT; same as item 77			
346		. . . WASHER, LOCK; same as item 50			
347		. . . NUT, HEX; same as item 51			

348	A102	. . . TERMINAL BOARD ASSEMBLY	B111749		
PARTS					ATTACHING
349		. . . SCREW, MACH; same as item 49			
350		. . . WASHER, LOCK; same as item 50			
351		. . . WASHER, FLAT; same as item 77			

352	C101	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; 100 uuf ± 5%, 500 vdc		CM20B1O1J (MIL-C-5A)

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Audio Amplifier Chassis - 100

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
353	R101	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 334		
354	R102	. . . .	RESISTOR, FIXED, COMPOSITION; 150,000 ohms ±5%, 1/2 watt		RC20GF154J (MIL-R-11B)
355	TB101	. . . .	TERMINAL BOARD; phenolic, w/12 turret lugs, over-all dim.: 3 in. lg by 1-3/4 in. wide by 1/8 in. thk		B111988
356	P101	. . .CONNECTOR, PLUG, ELECTRICAL; 14 male contacts		MS24010	
357		. . .SHIELD, ELECTRICAL CONNECTOR; aluminum, w/cable clamp, 7/16 in. dia max cable accommodated, over-all dim. excluding cable clamp: 1-1/32 in. lg by 1-1/4 in. wide by 7/16 in. deep			WIQ MRE 14H
358		. . . GROMMET; rubber, 3/8 in. LD		AN931-6-10	
(MIL-G-3036) 359	E103	. . . SHIELD, ELECTRON TUBE		TS102U03 (JAN-S-28A)	
360	E102	. . . SHIELD, ELECTRON TUBE; same as item 359			
361	E101	. . . SHIELD, ELECTRON TUBE; same as item 359			
362	V103	. . . ELECTRON TUBE			6005/6AQ5W (MIL-E-1)
363	V102	. . . ELECTRON TUBE; same as item 183			
364	V101	. . . ELECTRON TUBE; same as item 183			
365	XV103	. . . SOCKET, ELECTRON TUBE; same as item 186			
366	SV102	. . . SOCKET, ELECTRON TUBE; same as item 186			
367	XV101	. . . SOCKET, ELECTRON TUBE; same as item 186			
368		. . . STRAP, RETAINING; same as item 192			
PARTS 369		. . . SCREW, MACH; Same as item 289			ATTACHING
370		. . . WASHER, LOCK; same as item 115			*----------*
371		. . .CLAMP, CABLE; 1/2 in. dia max cable accommodated	B517516		

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Audio Amplifier Chassis - 100

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
					ATTACHING
PARTS					
372		. . .SCREW, MACH; binding hd, cadmium plated steel, 6-32 NC-2 thread, 7A6 in. lg	A512347		
373		. . . WASHER, LOCK; same as item 50			
374		. . . WASHER, FLAT; same as item 77			
375		. . . NUT, HEX; same as item 51			

376	C110	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 500,000 uuf ±10%, 600 vdc		CP55B1EF504K	(MIL-C-25A)
					ATTACHING
PARTS					
377		. . . SCREW, MACH; same as item 133			
378		. . . WASHER, LOCK; same as item 134			
379		. . . NUT, HEX; same as item 268			

380	C106	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 300 vdc		CP11A1EF104K	(MIL -C-25A)
381	C193	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 380			
382	C109	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 600 vdc		CP05A1EF104K	(MIL -C -25A)
383	C105	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 382			
384	C102	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 10,000 uuf 10%, 600 vdc		CP09A1EF103K	(MIL-C -25A)
385		. . .POST, TERMINAL; asbestos filled melamine, one 6-32 thread insert, over-all dim.: 23/32 in. high by 1/4 in. dia			WIQ 773
					ATTACHING
PARTS					
386		. . .SCREW, MACH; binding hd, cadmium plated steel, 6-32 NC-2 thread 1/4 in. lg	A512444		
387		. . . WASHER, LOCK; same as item 50			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
388		. . .CHASSIS, AUDIO AMPLIFIER; aluminum, over-all dim.: 6-3/16 in. lg by 3-9/16 in. wide by 3 in. high	C109801		
389	10-7	. . MODULATOR CHASSIS	D110098		
					ATTACHING
PARTS					
390		. . SCREW, MACH; same as item 133			
391		. . WASHER, LOCK; same as item 134			

392	A201	. . . MAGNET ASSEMBLY (with attaching hardware)	B111026		
393		. . .TERMINAL, LUG; brass, hot tin dipped, 45° angle of bend, over-all dim.: 7/16 in. lg by 7/32 in. wide, by 1/32 in. thk			ZE 333
					ATTACHING
PARTS					
394		. . . NUT, HEX; same as item 115			

395	V201	. . . ELECTRON TUBE			6D4 (MIL-E-1)
396	E202	. . . SHIELD, ELECTRON TUBE; same as item 174			
397	E203	. . . SHIELD, ELECTRON TUBE; same as item 176			
398	E205	. . . SHIELD, ELECTRON TUBE; same as item 174			
399	E204	. . . SHIELD, ELECTRON TUBE; same as item 176			
400	V202	. . . ELECTRON TUBE; same as item 183			
401	V203	. . . ELECTRON TUBE			U14A (MIL-E-1)
402	V205	. . . ELECTRON TUBE; same as item 183			
403	V204	. . . ELECTRON TUBE; same as item 182			
404	XV202	. . . SOCKET. ELECTRON TUBE; same as item 186			
405	XV203	. . . SOCKET, ELECTRON TUBE; same as item 188			
406	XV205	. . . SOCKET, ELECTRON TUBE; same as item 186			
407	XV204	. . . SOCKET, ELECTRON TUBE; same as item 188			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME		CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)		N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
408		. . . STRAP, RETAINING; same an item 192			
409		. . . STRAP. RETAINING; same as item 193			
					ATTACHING
PARTS					
410		. . . SCREW. MACH; same as item 194			
411		. . . WASHER, LOCK; same as item 115			
412	C202	. . .CAPACITOR, FIXED, PAPER ELECTRIC; 0. 10 uf ±20%, 600 vdc		CP10A1EF104M	
					ATTACHING
PARTS					
413		. . . SCREW, MACH; same as item 263			
414		. . . WASHER, LOCK; same as item 50			
415		. . . NUT, HEX; same as item 51			

416	C205	. . . CAPACITOR, FIXED, 400 vdc	PAPER DIELECTRIC; 0.1 uf, ±20%		CP11A3EE104M (MIL-C-25A)
417	C203	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 1.0 uf, ±20%. 100 vdc		CP11A3EB105M	(MIL-C-25A)
418	C204	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; Same as item 412			
					ATTACHING
PARTS					
419		. . . SCREW, MAC; same as item 263			
420		. . . WASHER, LOCK; same as item 50			
421		. . . NUT, HEX; same item 51			

422	C201	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 0.25 uf ±20%, 600 vdc		CP61B1EF254M	(MIL-C-25A)
423		. . .BRACKET, CAPACITOR; 1.563 in. high by 0.7660 in. deep, spade type bracket		CP06SA3 (MIL-C-25A)	
					ATTACHING
PARTS					
424		. . . WASHER. LOCK; same as item 50			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
425		. . . NUT, HEX; same as item 51			
426	K201	. . .RELAY, ARMATURE; 10,000 ohms ±8%, 5.75 ma rated current, 57. 5 vdc, contact pull in voltage 36 to 46 vdc, contacts drop out below 28 vdc, 2-7/16 in. high by 1-5/8 in. wide	BP-16431		
					ATTACHING
PARTS					
427		. . . WASHER, LOCK; same as item 50			
428		. . . NUT, HEX; same as item 51			

429	C212	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 0.05 uf ±10%, 600 vdc		CP61B1EF503K	(MILC-25A)
430		. . .BRACKET, CAPACITOR; 1 in. high by 0.766 in. deep, spade type bracket		CP06SA1	(ML-C-25A)
					ATTACHING
PARTS					
431		. . . WASHER, LOCK; same as item 50			
432		. . . NUT, HEX; same as item 51			

433	C215	. . .CAPACITOR, FIXED, MICA DIELECTRIC; 4700 uuf ±10%, 500 vdc		CB35B472K	(MIL-C-5A)
434		. . . POST, TERMINAL; same as item 159			
					ATTACHING
PARTS					
435		. . . SCREW, MACH; same as item 194			
436		. . . WASHER, LOCK; same as item 115			

437	J204	. . . JACK, TIP, same as item 199			
438	J205	. . . JACK, TIP, same as item 199			
439	J206	. . . JACK, TIP, same as item 199			
440	J207	. . . JACK, TIP; same as item 199			
441	J208	. . . JACK, TIP; same as item 199			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
442	R244	. . .RESISTOR, FIXED, WIREWOUND;, power type, 5,000 ohms ±3%		RH50G502H	(MIL-R-18546B)
					ATTACHING PARTS
443		. . . SCREW, MACH; same as item 160			
444		. . . WASHER, LOCK; same as item 115			
445		. . .WASHER, FLAT; cadmium plated steel, 0.125 in. ID, 0.312 in. OD, 0.016 in. thk	A503602		
446		. . . NUT, HEX; same as item 219			*----------*
447		. . .SHIELD, ELECTRICAL CONNECTOR; aluminum, w/21/32 in. dia cable clamp, overall dim.: 2 in. lg by 2 in. wide by 53/64 in. deep			WIQ MRE 34H
448	P201	. . .CONNECTOR, PLUG, ELECTRICAL; 34 male contacts		MS24022	
449		. . . CLAMP, CABLE; same as item 147			
					ATTACHING PARTS
450		. . . SCREW, MACH; binding hd, #8-32 by 7/16 in. lg	A512462		
451		. . . WASHER, LOCK; same as item 134			
452		. . .WASHER, FLAT; cadmium plated steel, 0.174 in. ID, 0.375 in. OD, 0.016 in. thk	A503604		
453		. . . NUT, HEX; same as item 268			*----------*
454		. . . GROMMET; same as item 121			
455		. . . POST, TERMINAL; same as item 159			
					ATTACHING PARTS
456		. . . SCREW, MACH; same as item 194			
457		. . . WASHER, LOCK; same as item 115			*----------*
458	E206	. . . SHIELD, ELECTRON TUBE; same as item 174			
459	E207	. . . SHIELD, ELECTRON TUBE; same as item 359			

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
460	E208	. . . SHIELD, ELECTRON TUBE; same as item 176			
461	E210	. . . SHIELD, ELECTRON TUBE; same as item 176			
462	E209	. . . SHEILD, ELECTRON TUBE; same as item 359			
463	E211	. . . SHIELD, ELECTRON TUBE; same as item 174			
464	V206	. . . ELECTRON TUBE			6AH6 (MIL-E-1)
465	V207	. . . ELECTRON TUBE; same as item 362			
466	V208	. . . ELECTRON TUBE; Same as item 401			
467	V210	. . . ELECTRON TUBE; same as item 401			
468	V209	. . . ELECTRON TUBE			0AZWA (MIL-E-1)
469	V311	. . . ELECTRON TUBE; same as item 180			
470	XV206	. . . SOCKET, ELECTRON TUBE; same as item 186			
471	XV207	. . . SOCKET. ELECTRON TUBE; same as item 186			
472	XV208	. . . SOCKET, ELECTRON TUBE; same as item 188			
473	XV210	. . . SOCKET. ELECTRON TUBE; same as item 188			
474	XV209	. . . SOCKET, ELECTRON TUBE; same as item 186			
475	XV211	. . . SOCKET, ELECTRON TUBE; same as item 186			
476		. . . STRAP, RETAINING; same as item 192			
477		. . . STRAP, RETAINING; same as item 193			
478		...SCREW, MACH; same as item 194		ATTACHING PARITS	
479		...WASHER. LOCK; same as item 115			
480	C210	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; came as . . . item 422			*----------*
481		. . . BRACKET, CAPACITOR; same as item 423			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
					ATTACHING
PARTS					
482		. . . WASHER, LOCK; same as item 50			
483		. . . NUT, HEX; same as item 51			*----------*
484	J202	. . .CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 155			
485	C211	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 2 uf ±10%, 600 vdc		CP70B1FF205K	(MIL -C -25A)
486		. . .BRACKET, CAPACITOR; 2.735 in. high by 0.906 deep, spade type bracket		CP07SA3 (MIL-C-25A)	
					ATTACHING
PARTS					
487		. . . WASHER, LOCK; same as item 29			
488		. . . NUT, HEX; #10-32 thread			AN315-3R *----------*
489	A202	. . . SHAFT LOCK ASSEMBLY; same as item 135			
490		. . . . NUT, LOCK; same as item 136			
491		. . . . BUSHING-SHAFT, PANEL; same as item 137			
492	R250	. . .RESISTOR, VARIABLE, COMPOSITION; 250,000 ohms ±10%, 2 watts		RV4NAVSD254A	(MIL-R-94A)
493	R227	. . .RESISTOR, VARIABLE, COMPOSITION; same as item 142			
494	R218	. . .RESISTOR, VARIABLE, COMPOSITION; same as item 41			
495	J203	. . .CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 155			
496	C220	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 500,000 uuf ± 20%, 600 vdc		CP61B1EF504M	(MIL-C-25A)
497		. . .BRACKET, CAPACITOR; 1.938 in. high by 0.766 in. deep, spade type bracket		CP06SA4	(MIL-C-25A)

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
					ATTACHING
PARTS					
. 498		. . .WASHER. LOCK; same as Item 50			
499		. . .NUT, HEX; Same as item 51			
500	C216	. . .CAPACITOR, FIXED, PAPER DIELECTRIC; 100.000 uuf ±10%. 600 vdc		*----------* CP11A3EF104K (MIL-C-25A)	
501	C219	. . .CAPACITOR, FIXED. MICA DILELECTRIC; 47 uuf ±10%. 500 vdc		CM20B470K	(MIL-C-5A)
502	R272	. . .RESISTOR, FIXED, COMPOSITION; 3300 ohms ±10%. ½ watt		RC20GF332K	(MIL-R-11B)
503	R221	. . .RESISTOR. FIXED. COMPOSITION; 130,000 ohms ± 5%, ½ watt		RC20GF134J	(MIL-R-11B)
504	C221	. . .CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172			
505	A203	. . . TERMINAL BOARD ASSEMBLY	D110094		
					ATTACHING
PARTS					
: 506		. . . SCREW, MACH; same as item 263			
507		. . . WASHER. LOCK; same as item 50			
508		. . . WASHER. FLAT; same as item 77			* ----------
--*					
509	A230	. . .. RESISTOR. FIXED, COMPOSITION; 680 ohms ±5%.	½ watts	RC20GF681J	(MIL-R-11B)
510	R245	. . .. RESISTOR. FIXED, COMPOSITION; 470 ohms ±5%.	1 watts	RC32GF471J	(MIL-R-11B)
511	R203	. . . .	RESISTOR. FIXED, COMPOSITION; 3300 ohms ±10%, 2 watts		RC42GF332K (MIL-R-11B)
512	R204	. . . .	RESISTOR. FIXED, COMPOSITION; 6800 ohms ±10%, 2 watts		RC42GF682K (MIL-R-11B)
513	R205	. . . .	RESISTOR, FIXED. COMPOSITION; same as item 512		
514	R202	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 511		

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
515	R201	. . . . RESISTOR, FIXED, COMPOSITION; 8200 ohm ±10%, 2 watt		RC42GF822K (MIL-R-11B)	
516	R207	. . . . RESISTOR, FIXED, COMPOSITION; 22,000 ohms ±10%, 1 watt		RC32GF223K (MIL-R-11B)	
517	C209	. . . . CAPACITOR. FIXED. MICA DIELECTRIC; 150 uuf ±5%. 500 vdc		CM20B151J (MIL-C-5A)	
518	R210	. . . . RESISTOR, FIXED, COMPOSITION; 62,000 ohms ±5%. 1/2 watt		RC20GF623J (MIL-R-11B)	
519	R209	. . . . RESISTOR, FIXED, COMPOSITION; 82,000 ohms ±10%, 1/2 watt		RC32GF623K (MIL-R-11B)	
520	R243	. . . . RESISTOR, FIXED, COMPOSITION; 470.000 ohms ±10, 1/2 watt		RC200GF474K (MIL-R-11B)	
521	R242	. . . . RESISTOR, FIXED, COMPOSITION same as item 337			
522	R240	. . . . RESISTOR, FIXED, COMPOSITION same as item 519			
523	R248	. . . . RESISTOR, FIXED, COMPOSITION; 2.2 megohms ±10%, 1/2 watt		RC20GF225K (MIL-R-11B)	
524	R274	. . . . RESISTOR, FIXED, COMPOSITION; 560,000 ohms ±10%, 1/2 watt		RC20GF564K (MIL-R-11B)	
525	R238	. . . . RESISTOR, FIXED, COMPOSITION ; 47,000 ohms ±10%, 1 watt		RC33GF473K (MIL-R-11B)	
526	R246	. . . . RESISTOR, FIXED, COMPOSITION; 18,000 ohms ±10%, 2 watt		RC42GF183K (MIL-R-11B)	
527	R249	. . . . RESISTOR, FIXED, COMPOSITION ; 820,000 ohn ±10%, 1/2 watt		RC20GF824K (MIL-R-11B)	
528	R208	. . . . RESISTOR, FIXED, COMPOSITION; 560 ohm ±5%., 1/2 watt		RC20GF561J (MIL-R-11B)	
529	R261	. . . . RESISTOR, FIXED, COMPOSITION 470 ohms ±5%, 1/2 watt		RC20GF471J (MIL-R-11B)	
530	R206	. . . . RESISTOR, FIXED, COMPOSITION; same as item 337			

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modulator Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
531	R260	. . . . RESISTOR. FIXED, COMPOSITION; 10,000 ohms ± 5%. 2 watts		RC42GF103J	(MIL-R-11B)
532	R228	. . . . RESISTOR, FIXED, COMPOSITION; same as item 128			
533	R215	. . . . RESISTOR, FIXED. COMPOSITION; 430,000 ohms ±5%, 1/2 watt		RC20GF434J	(MIL-R-11B)
534	R212	. . . . RESISTOR. FIXED, COMPOSITION; same as item 128			
535	RT237	. . . . RESISTOR, THERMAL; fiber cartridge, cold resistance: 60,500 ohms ± 29%. over-all dim.: 1-5/16 in. lg by 17/64 in. wide			VIEC 46A1
536		. . . . CLIP, ELECTRICAL; nickel plated brass., over-all dim.: 7/16 in. high by 3/8 in. wide by 17/64 in. deep			ZE 106
537		. . . . TERMINAL. LUG; same as item 393			
PARTS					ATTACHING
538		. . . . SCREW, MACH; same as item 160			
539		. . . . WASHER, LOCK; same as item 115			
540		. . . . WASHER, FLAT; same as Item 445			
541		. . . . NUT, HEX; same as Item 219			*----------*
542	R247	. . . . RESISTOR, FIXED, COMPOSITION; same as item 502			
543	R213	. . . . RESISTOR, FIXED, COMPOSITION; 2200 ohms ±10%. 1/2 watt		RC20GF222K	(MIL-R-11B)
544	R254	. . . . RESISTOR. FIXED, COMPOSITION; same as item 531			
545	R217	. . . . RESISTOR. FIXED, COMPOSITION; 270,000 ohms ±10%, 1/2 watt		RC20GF274K	(MIL-R-11B)
546	R223	. . . . RESISTOR. FIXED, COMPOSITION; 510,000 ohms ± 5%. 1/2 watt		RC20GF514J	(MIL-R-11B)
547	R224	. . . . RESISTOR, FIXED. COMPOSITION; 51,000 ohms ± 5%, 2 watts		RC42GF513J	(MIL-R-11B)
548	R225	. . . . RESISTOR. FIXED, COMPOSITION; same as item 547			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modular Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
549	C214	. . . .	CAPACITOR.	FIXED, MICA DIELECTRIC; 30 uuf ±5%,	
CM20B300J			500 vdc		(MIL-C-5A)
550	R259	. . . .	RESISTOR, FIXED, COMPOSITION; 4,700 ohm ±10%,		RC20GF472K
			1/2 watt		(MIL-R-11B)
551	C224	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; 820 uuf ±10%.		CM30B821K
			500 vdc		(MIL-C-5A)
552	R257	. . . .	RESISTOR, FIXED, COMPOSITION; 2000 ohms ±5%,		RC42GF202J
			2 watts		(MIL-R-11B)
553	R256	. . . . .	RESISTOR, FIXED, COMPOSITION; 3600 ohm ±5%,		RC42GF362J
			2 watts		(MIL-R-11B)
554	R255	. . . .	RESISTOR, FIXED, COMPOSITION; 1600 ohms ±5%,		RC42GF162J
			2 watts		(MIL-R-11B)
555	R270	. . . .	RESISTOR, FIXED, COMPOSITION; 68,000 ohms ±5%.		RC20GF683J
			1/2 watt		(MIL-R-11B)
556	R269	. . . .	RESISTOR, FIXED, WIREWOUND; 10,000 ±10%, 5 watts,		DABU
RS-5			400 vdc, overall body dim: 7/8 in. lg by 5/16 in. dia		
557	R264	. . . .	RESISTOR, FIXED, COMPOSITION; 3300 ohms ±5%:		RC42GF332J
			2 watts		(MIL-R-11B)
558	C218	. . . .	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC;		CV11A120
			3 uuf min, 12 uuf max, 500 vdc		(MIL-C-81A)
559	C217	. . . .	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC; same as item 215		
		ATTACHING PARTS			
560		. . . .	SCREW, MACH; same as item 216		
561		. . . .	WASHER, FLAT; same as item 218		
562		. . . .	NUT, HEX; same as item 219		

563	R263	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 557		
564	R215	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 557		

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Modular Chassis - 200

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
565	CR201	. . . .	SEMICONDUCTOR DEVICE, DIODE; same as item 249		
566	R232	. . . .	RESISTOR, FIXED.	COMPOSITION; 1.000 ohms ±5%,	RC20GF102J
			1/2 watt		(ML-R-11B)
567	R267	. . . .	RESISTOR, FIXED, COMPOSITION; 110,000 ohms ±5%.		RC20GF114J
			1/2 watt		(MIL-R-11B)
568	R263	. . . .	RESISTOR,	FIXED, COMPOSITION; 1.8 megohms ±5%,	RC20GF185J
			1/2 watt		(MIL-R-11B)
569	R262	. . . .	RESISTOR,	FIXED, COMPOSITION; 220,000 ohms ±5%.	RC20GF224J
			1/2 watt		(MIL-R-11B)
570	R235	. . . .	RESISTOR, FIXED, COMPOSITION; 12.000 ohms ±5%,		RC20GF123J
			1/2 watt		(MIL-R-11B)
571	R226	. . . .	RESISTOR, FIXED, COMPOSITION; 43,000 ohms ±5%,		RC20GF433J
			1/2 watt		(MIL-R-11B)
572	R258	. . . .	RESISTOR, FIXED, COMPOSITION; 330,000 ohms ±5%.		RC20GF334J
			1/2 watt		(MIL-R-11B)
573	R216	. . . .	RESISTOR, FIXED, COMPOSITION; 1.6 megohms ±5%,		RC20GF165J
			1/2 watt		(MIL-R-11B)
574	C213	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 352		
575	R252	. . . .	RESISTOR.	FIXED, COMPOSITION; 4700 ohms ±5%	RC420F472J
			2 watts		(MIL-R-11B)
576	R253	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 354		
577	R222	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 230		
578	R273	. . . .	RESISTOR,	FIXED, COMPOSITION; same as item 502	
579	R268	. . . .	RESISTOR, FIXED, COMPOSITION; 1500 ohms ±5%.		RC20GF152J
			1/2 watt		(MIL-R-11B)
580	C223	. . . .	CAPACITOR.	FIXED, PAPER DIELECTRIC; 22,000	CP05A1KF223K
			uuf ±10%, 600 vdc		(MIL-C-25A)
581	R236	. . . .	RESISTOR, FIXED, COMPOSITION; 5100 ohms ±5%,		RC20GF512J
			1/2 watt		(MIL-R-11B)

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
582	C207	. . . . ±5%, 300 vdc	CAPACITOR, FIXED, MICA DIELECTRIC; 9100 uuf	(MIL-C-5A)	CM35B912J
583	R219	. . . . 1/2 watt	RESISTOR.	FIXED, COMPOSITION; 120,000 ohms ±10% (MIL-R-11B)	RC20GF124K
584	C208	. . . . item 582	CAPACITOR, FIXED, MICA DIELECTRIC; same as		
585	C206	. . . . item 517	CAPACITOR, FIXED, MICA DIELECTRIC; same as		
586	R223	. . . .	RESISTOR.	FIXED, COMPOSITION; same as item 570	
587	R234	. . . .	RESISTOR.	FIXED, COMPOSITION; same as item 566	
588	R229	. . . .	RESISTOR.	FIXED, COMPOSITION; same as item 561	
589	TB201	. . . . electrical clips, over-all dim.: 9-3/8 in. lg by 4-3/16 in. wide by 1/8 in thk	TERMINAL BOARD; phemolic, w/103 turret lugs, 2		C110093
590		. . .CHASSIS, MODULATOR; aluminum, caustic etched and iridite finish, over-all dim.: 10.031 in. lg. By 7-15/32 in. wide by 2-13/16 in. deep	C110097		
591	10-12	. . POWER SUPPLY CHASSIS	D109874		
		ATTACHING PARTS			
592		. . SCREW, MACH; 6-32 thread		MS35241-38	
593		. . SCREW, MACH; 6-32 thread		MS35241-37	

594	C412	. . .CAPACITOR, FIXED, ELECTROLYTIC; DC, 50 uf, 400 vdcw		CE41C500Q	(MIL-C-62A)
595	C413	. . .CAPACITOR, FIXED, ELECTROLYTIC; same as item 594			
596	C401	. . .CAPACITOR, FIXED, ELECTROLYTIC; 25 uf, 400 vdc		CE41C250Q	(MIL-C-62A)
597	C407	. . .CAPACITOR, FIXED, ELECTROLYTIC; same as item 596			
598	C408	. . .CAPACITOR, FIXED, ELECTROLYTIC; 10 uf, 400 vdc		CE41C100Q	(MIL-C-62A)

SERVICE NAME			CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)			N61339-29	15 x 12	Power Supply Chassis - 400
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
599	C403	. . .CAPACITOR, FIXED, ELECTRLYTIC; same as item 598			
600	T402	. . .TRANSFORMER, POWER, STEP-DOWN; primary data 115v 50 to 440 cps, secondary data: 6.4v ac all windings, meets requirements of Spec MIL-T-27A type TF1SXO1GA, over-all dim. Excluding mtg studs: 2-3/4 in wide by 2-3/8 in deep by 4 in. High	B111137		
		ATTACHING PARTS	601		. . .
		WASHER, LOCK; same as item 50	602		. . .
		NUT, HEX; same as item 51			

TUBE; stainless steel, passivate		603 . TTE 15Y finish, over-all dim.: 1-7/8 in. ID by 2-7/16 in OD	.	.	RETAINER, ELECTRON
604		. . .STUD, PLAIN; stainless steel, passivate finish, 8-32 thread supplied w/attaching hardware, over-all dim.: 4-1/4 in lg.			TTE 42
605	V401	. . . ELECTRON TUBE			5R4WGA (MIL-E-1)
606	XV401	. . . SOCKET, ELECTRON TUBE; 3 pins		TS101P01 (JAN-S-23A)	
		ATTACHING PARTS	607		. . .
		SCREW, MACH; same as item 49			
608		. . . NUT, HEX; same as item 51			
609		. . . WASHER, LOCK; same as item 50			

610		. . .RETAINER, ELECTRON TUBE; stainless steel, passivate finish, over-all dim.; 1-7/32 in. ID by 1-13/16 in. OD			TTE 3Y
611		. . . STUD, PLAIN; same as item 604			
612	V406	. . . ELECTRON TUBE			6L6WGB
(MIL-E-1)					
613	V402	. . . ELECTRON TUBE			6060WA (MIL-E-1)
614	V410	. . . ELECTRON TUBE; same as item 613			
615	XV406	. . . SOCKET, ELECTRON TUBE; same as item 606			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
616	XV402	. . . SOCKET, ELECTRON TUBE; same as item 606			
617	XV410	. . . SOCKET, ELECTRON TUBE; same as item 606			
		ATTACHING PARTS			
618		. . . SCREW, MACH; same as item 49			
619		. . . WASHER, LOCK; same as item 50			
620		. . . NUT, HEX; same as item 51			

621	E407	. . . SHIELD, ELECTRON TUBE; same as item 176			
622	E403	. . . SHIELD, ELECTRON TUBE; same as item 176			
623	V407	. . . ELECTRON TUBE		5751 (MIL-E-1)	
624	V403S	. . . ELECTRON TUBE; same as item 623			
625	XV407	. . . SOCKET, ELECTRON TUBE; same as item 188			
626	XV403	. . . SOCKET, ELECTRON TUBE; same as item 188			
627		. . STRAP, RETAINING; same as item 193			
		ATTACHING PARTS			
628		. . . SCREW, MACH; same s item 194			
629		. . . WASHER, LOCK; #4		AN936A4	

630	E406	. . . SHIELD, ELECTRON TUBE; same as item 174			
631	E405	. . . SHIELD, ELECTRON TUBE; same as item 359			
632	E404	. . . SHIELD, ELECTRON TUBE; same as item 359			
633	V408	. . . ELECTRON TUBE		5651 (MIL-E-1)	
634	V405	. . . ELECTRON TUBE		6X4W (MIL-E-1)	
635	V404	. . . ELECTRON TUBE; same s item 634			
636	XV408	. . . SOCKET, ELECTRON TUBE; same Is item 186			

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
637	XV405	. . . SOCKET, ELECTRON TUBE; same as item 186			
638	XV404	. . . SOCKET, ELECTRON TUBE; same as item 186			
639		. . . STRAP, RETAINING, same as item 192			
		ATTACHING PARTS			
640		. . . SCREW, MACH; same as item 194			
641		. . . WASHER, LOCK; same as item 629			
642	J404	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; 5 female contacts, w/lock ring, supplied w/attaching hardware, over-all dim.: 23/32 in.dia by 17/32 in. deep			WIQ M5S-LRN
643	T401	. . . TRANSFORMER, POWER, STEP-DOWN AND STEP-UP; primary: 115v 50 to 440 cps, secondarys: first: 440-0-440v, second: 5v, third and fourth: 6.4v, fifth: 400-0-400, over-all dim. excluding mtg studs: 5-9/16 in. lg by 4-5/16 In. wide by 5 in. high	B111677		
644	.	. . . BRACKET, ANGLE; aluminum, caustic etched and iridite finish, over-all dim.: 6 in.wide by 5-13/32 in. high by 4-23/32 in. deep	B116406		
		ATTACHING PARTS			
645		. . . WASHER, LOCK; #1/4		AN936B416	
646		. . . NUT, HEX; cadmium plated steel, 1/4-20 NC-2 thread *----------*	A502828		
647	J403	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; 20 female contacts		MS24013	
648	J405	. . . CONNECTOR, RECEPTACLE, ELECTRICAL; 4 female contacts, w/lock ring, supplied w/attaching hardware, over-all dim.: 5/8 in.dia by 17/32 in. deep			WIQ M48-LRN
649	J401	. . . JACK, TIP; same as item 199			
650	J402	. . . JACK, TIP; same as item 199			
651	R434	. . . RESISTOR, FIXED, COMPOSITION; same as item 224			
652	R419	. . . RESISTOR, FIXED, COMPOSITION; 1 megohm ±10%, 1 watt		RE32GF105K (MIL-R-11B)	

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
653	R416	. . . RESISTOR, FIXED, COMPOSITION; 470 ohms ±10%, 1/2 watt		RC20GF471K MIL-R-11B)	
654	C411	. . . CAPACITOR, FIXED, PAPER DIELECTRIC; 22,000 uuf ±10%, 200 vdc		CP09A1EC223K (MIL-C-25A)	
655	R406	. . . RESISTOR, FIXED, COMPOSITION; same as item 653			
656	R405	. . . RESISTOR, FIXED, COMPOSITION; same as item 653			
657	R412	. . . RESISTOR, FIXED, COMPOSITION; 220 ohms ±5%, 1/2 watt		RC20GF22IJ (MIL-R-11B)	
658	R421	. . . RESISTOR, FIXED, COMPOSITION; same as Item 653			
659	R418	. . . RESISTOR, FIXED, COMPOSITION; same as item 653			
660		. . . POST, TERMINAL; same as item 159			
		ATTACHING PARTS			
661		. . . SCREW, MACH; same a item 194			
662		. . . WASHER, LOCK; same as item 116			

663	A401	. . . TERMINAL BOARD ASSEMBLY	B111126		
		ATTACHING PARTS			
664		. . . SCREW, MACH; same u Item 386			
665		. . . WASHER, LOCK; same as item 50			

666	R422	. . . . RESISTOR, FIXED, COMPOSITION; 27 ohms ±5% 2 watts		RC42GF270J (MIL-R-11B)	
687	R431	. . . . RESISTOR, FIXED, COMPOSITION; same as item 666			
668	R408	. . . . RESISTOR, FIXED, COMPOSITION; 27 ohms ±10% 2 watts		RC42GF270K (MIL-R-11B)	
669	R413	. . . . RESISTOR, FIXED, COMPOSITION; 470,000 ohms ±5%, 1/2 watt		RC20GF474J (MIL-R-11B)	
670	R430	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
671	R427	. . . . RESISTOR, FIXED, WIREWOUND; 560,000 ohms, 1/2 watt, over-all body dim.: 0.565 in. dia. by 11/16 in. lg	B116391		
672	R425	. . . . RESISTOR, FIXED, COMPOSITION; 10,000 ohms l10o. 1/2 watt		RC20GF103K (MIL-R-11B)	
673	R411	. . . . RESISTOR, FIXED, COMPOSITION; 1 megaohm ±10% 1/2 watt		RC20GF105J (MIL-R-11B)	
674	R437	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
675	R436	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
676	R417	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
677	R420	. . . . RESISTOR, FIXED, COMPOSITION; 4700 ohms ±10%, 2 watts		RC42GF472K (MIL-R-11B)	
678	R410	. . . . RESISTOR, WIXED, COMPOSITION; 330,000 ohms ±10%, 2 watts		RC42GF334K (MIL-R-11B)	
679	R415	. . . . RESISTOR, FIXED, COMPOSITION; same as item 669			
680	R429	. . . . RESISTOR, FIXED, WIREWOUND, 220,000 ohms, 1/2 watt, over-all body dim.: 0.565 in. dia by 11/16 in. lg	B116403		
681	R403	. . . . RESISTOR, FIXED, COMPOSITION; 1.5 megaohms ±5%, 1/2 watt		RC20GF155J (MIL-R-11B)	
682	R438	. . . . RESISTOR, FIXED, COMPOSITION; 10 ohms ±10%. 2 watts		RC42GF100K (ML-R-11B)	
683	R404	. . . . RESISTOR, FIXED, COMPOSITION; same as item 237			
684	R407	. . . . RESISTOR, FIXED, COMPOSITION; same as item 337			
685	R405	. . . . RESISTOR, FIXED, COMPOSITION; same as item 668			
666	R435	. . . . RESISTOR, FIXED, COMPOSITION; same as item 224			
687	R433	. . . . RESISTOR, FIXED, COMPOSITION: 680,000 ohms ±10%, 1/2 watt		RC200F684K (MIL-R-11B)	
688	R432	. . . . RESISTOR, FIXED, COMPOSITION; same as item 230			
689	R434	. . . . RESISTOR, FIXED, COMPOSITION; same as item 673			

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MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
690	R423	• • • •	RESISTOR, FIXED, COMPOSITION; 620,000 ohms ±5%, 1/2 watt		RC20GF624J (MIL-R-11B)
691	R426	• • • •	RESISTOR, FIXED, COMPOSITION; 180,000 ohms ±5%, 1 watt		RC32GF184J (MIL-R-11B)
692		• • • •	BRACKET, ANGLE; cadmium plated steel, over-all dim.: 2-1/16 in. lg by 1 in. wide		B509501
		ATTACHNG PARTS			
693		• • • •	SCREW, MACH; same as item 148		
694		• • • •	WASHER, LOCK; same as item 50		
695		• • • •	WASHER, FLAT; same as item 77		
696	TB401	• • • •	TERMINAL BOARD; phenolic, w/36 turret type lugs, over-all dim.: 6-1/4 in. lg by 2-1/16 in. wide by 1/8 in. thk		C111127
697	C406	• • •CAPACITOR, FIXED, PAPER DIELECTRIC; 470,000 uuf ±10%, 400 vdc		CP10A1EE474K	(ML-C-25A)
698		• • • TERMINAL, LUG;, same a item 122			
699	C415	• • •CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 697			
700	C402	• • •CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 697			
		ATTACHNG PARTS			
701		• • • SCREW, MACH; same as item 49			
702		• • • WASHER, LOCK; same as item 50			
703		• • • NUT, HEX; same as item 51			
704	A402	• • • SHAFT LOCK ASSEMBLY; same as item 135			
705		• • • •	NUT, LOCK; same as item 136		
706		• • • •	BUSHING-SHAFT, PANEL; same as item 137		

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
707	R428	• • •RESISTOR, VARIABLE, COMPOSITION; same as item 142			
708	R414	• • •RESISTOR, VARIABLE, COMPOSITION; same as item 142			
709	S402	• • • SWITCH, THERMOSTATIC; same as item 278			
		ATTACHNG PARTS			
710		• • •SCREW, MACH; binding head, cadmium plated steel, 4-40NC-2 thread by 5/8 in. lg	A512427		
711		• • • WASHER, LOCK; same as item 115			
712		• • • NUT, HEX; same as item 219			
713		• • •POST, MOUNTING; gray anodized aluminum, circular shape, over-all dim.: 0.15 in. OD by 1/4 in. ID by 3/8 in. lg	B510115		
714		• • • POST, TERMINAL; same as item 159			
		ATTACHNG PARTS			
715		• • • SCREW, MACH; same as item 289			
716		• • • WASHER, LOCK; same as item 629			
717		• • •POST, TERMINAL; melamine body, silver plated brass terminals, 4-40 internal thread 7/32 in. deep, overall dim.: 1/4 in. across flats by 27/32 in. high	A523201		
		ATTACHNG PARTS			
718		• • • SCREW, MACH; same as item 710			
719		• • • WASHER, LOCK; same as item 115			
720		• • • GROMMET, ELASTIC; 5/8 in. ID		AN931-10-14	
(MIL-G-3036) 721	A403	• • • FASTENER ASSEMBLY, CHASSIS	D113126		
722		• • • •	NUT, SELF-LOCKING, PLATE; aluminum, floating type, two 0. 098 in. dia mtg holes on 0.312 in. centers, 6-32 NC-2 thread, overall dim.: 1.063 in. lg by 0.531 in. wide		EN 22NA217-22-62

SERVICE NAME		CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)		N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
723		• • • •	NUT, SELF-LOCKING, PLATE; aluminum, floating type, two 0.098 in. dia mtg holes on 0.688 in. centers,		EN
12LHA401-62			6-32 NC-2 thread, over-all dim.: 0.968 in. lg by 0.406 in. wide		
		ATTACHNG PARTS			
724		• • • •	SCREW, MACH; #2-56 thread		AN505-2-5
725		• • • •	WASHER, LOCK; cadmium plated bronze, 0.116 in. ID, 0.270 in. OD		A520821
726		• • • •	NUT, HEX; #2-56 thread		AN340-2
727		• • •CHASSIS, POWER SUPPLY; aluminum, caustic etch and iridite finish, over-all dim.: 12-1/4 in. lg by 8-9/16 in. wide by 2-27/32 in. high	D111991		
728	10-17	• • BLOWER ASSEMBLY	C110182		
		ATTACHNG PARTS			
729		• • SCREW, .MACH; 6-32 thread		MS35241-24	
730		• • •SHIELD, ELECTRICAL CONNECTOR; molded melamine, w/cable clamp, 19/64 in. dia max cable accommodated, over-all dim. except cable clamp: 21/32 in. dia by 21/32 in. lg			WIQ H19CS
731	P404	• • •CONNECTOR, PLUG, ELECTRICAL; 5 male contacts, w/lock spring, supplied w/attaching hardware, over-all dim.: 25/32 in. dia by 17/32 in. deep			WIQ M5P-LSN
732		• • • CLAMP, CABLE; nylon, 1/4 in. dia nom size cable accommodated, 1 mtg hole 13/64 in. dia	B517512		
		ATTACHNG PARTS			
733		• • • SCREW, MACH; same as item 450			
734		• • • WASHER, LOCK; same as item 134			
735		• • • NUT, HEX; same as item 268			

TD80 22 (T22-100/1-4-57)

MAJOR ASSEMBLY PARTS LIST

SERVICE NAME	CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NUMBER SERIES
Radar Signal Interference Trainer (X-Band)	N61339-29	15 x 12	Power Supply Chassis - 400

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	PART NAME AND DESCRIPTION 1 2 3 4 5 6 7 (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOV'T TYPE DESIG. AND SPEC NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIG. (6)
736		• • •IMPELLER, FAN, AXIAL; aluminum, 4 blades, over-all dim.: 5 in. dia, w/attaching hardware			TTM 0-520-4
737	B401	• • •MOTOR, ALTERNATING CURRENT; 115v ac, 50-1000 cps, single phase, 0.4 amp 1/300 hp, 2500 rpm			Rotating Components Inc NBC-K15-8
		ATTACHNG PARTS			
738		• • • SCREW, MACH; same as item 49			
739		• • • WASHER, LOCK; same as item 50			
740		• • •BRACKET, AXIAL FAN; cadmium plated CRES, 3 radiating arms evenly spaced 120° apart, over-all dim. each arm: 1/2 in. w. de by 1/8 in. thk by 2-3/4 in. lg from center hole	B108068		
		ATTACHNG PARTS			
741		• • •SCREW, MACH; cadmium plated steel, 10-32 NF-2 thread 3/8 in. lg	A152175		
742		• • • WASHER, LOCK; same as Item 29			
743		• • •PLATE, RETAINING, AXIAL FAN; aluminum, caustic etch and iridite finish, w/protective ring for impeller, over-all dim.: 6-3/4 in. lg by 6-25/32 in. high by 27/32 in. deep	C111759		
744		• • FRAME, RADAR SIGNAL INTERFERENCE; aluminum, caustic etched and iridite finish, w/permanently afixed hardware, overall dim.: 17-1/2 in. wide by 11-1/2 in. high by 13-1/8 in. deep	D109970		

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

TABLE 9-4 NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
AK5100		135			13	
AK5168		192			17	
AK5169		193			7	
AN123866		6			1	
AN315-3R		488			2	
AN340-2		726			8	
AN340-4		219			12	
AN340-6		51			36	
AN340-8		268			8	
AN500-8-12		266			4	
AN500A2-5		303			6	
AN505-2-5		724			8	
AN510-10-8		31			4	
AN5154-5		18			4	
AN515C4-4		317			8	
AN535-2-2		65			4	
AN931-10-14		720	5325-249-4354		1	
AN931-12-17		121	5325-286-5944		4	
AN931-6-10		358			1	
AN931A7-11		306			1	
AN935-2		304			6	
AN935-4L		19			4	
AN935-8L		267			4	
AN936A4		629			13	
AN936B10		29			13	
AN936B4		115			65	
AN936B416		645			4	
AN936SB6		50			74	
AN936A616		145			8	
AN936B8		134			16	
AN936C10		32			4	
AP15297		136			13	
AP15342		137			13	
A107612		17			2	
A107625		316			1	
A152175		741			3	
A502823		277			9	
A502825		286			1	
A502828		646			4	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
A503602		445			4	
A503603		276			10	
A503604		452			1	
A503613		77			26	
A512422		194			48	
A512423		289			13	
A512424		160			10	
A512427		710			4	
A512428		216			6	
A512429		279			2	
A512443		255			4	
A512444		386			7	
A512445		263			6	
A512446		49			35	
A512447		148			5	
A512450		344			2	
A512461		133			14	
A512462		450			2	
A512475		28			8	
A512647		372			1	
A515902		275			13	
A530803		290			4	
A530821		725			8	
A530827		146			8	
A523201		717			2	
A523203		159			12	
BP-16431		426			1	
B107609		20			1	
B107623		315			1	
B107624		314			1	
B107626		313			1	
B108068		740			1	
B109806		326			1	
B109807		342			1	
B110305		254			1	
B111026		392			1	
B111027		36			1	
B111126		643			1	
B111137		600			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
B111677		643			1	
B111735		307			1	
B111736		309			1	
B111738		294			1	
B111742		298			2	
B111744		308			1	
B111749		348			1	
B111755		129			1	
B111756		123			1	
B111758		251			1	
B111985		100			1	
B111986		258			1	
B111988		355			1	
B111992		45			1	
B112008-1		91			1	
B112008-2		87			1	
B112008-3		83			1	
B112008-4		79			1	
B112009		44			1	
B113113		43			1	
B113114		95			1	
B113115		96			1	
B115985		272			1	
B115986		283			2	
B116390		7			1	
B116391		671			1	
B116392		229			1	
B116396		301			1	
B116397		11			1	
B118403		680			1	
B116406		644			1	
B116407		302			1	
B116408		322			1	
B116741		288			1	
B509501		692			2	
B510115		713			2	
B517506		74			2	
B517512		732			1	
B517516		371			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 **CONTRACT NO. N61339-29**

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
B517518		147			2	
C-173A	Mepco Co. Inc.	169			1	
C-173B	Mepco Co. Inc.	170			1	
CE41C100Q		598	5910-112-7801		2	
CE41C250Q		596			2	
CE41C500Q		594	5910-184-3838		2	
CK63Y103Z		172			4	
CM20B101J		352	5910-101-5616		2	
CM20B101K		332			2	
CM20B151J		517	5910-101-5590		2	
CM20B300J		549	5910-101-5771		1	
CM20B470K		501	5910-101-4900		1	
CM20B660J		214	5910-101-5654		1	
CM30B821K		551	5910-160-1808		1	
CM35B103K		336			1	
CM35B472K		433			1	
CM35B912J		582			2	
CO-02MFF(2/16)8J0375		14			1	
CP05A1EC104K		127	5910-667-7062		1	
CP05A1EF104K		382			2	
CP05A1EF104M		158	5910-644-0689		1	
CP05A1KF223K		580	5910-644-6161		1	
CP068A1		430			1	
CP068A3		423	5910-129-6123		2	
CP068A4		497			1	
CP078A3		486			1	
CP09A1EC223K		654			1	
CP09A1EF103K		384			1	
CP10A1EE474K		697			3	
CP10A1EF104M		412			2	
CP11A1EF104K		380			2	
CP11A3EB105M		417			1	
CP11A3EE104M		416			1	
CP11A3EF104K		500			1	
CP41B1FF405K		252	5910-129-9237		2	
CP55B1EF504K		376	5910-170-2779		1	
CP61B1EF254M		422	5910-112-7426		2	
CP61B1EF503K		429	5910-112-7319		1	
CP61B1EF504M		496			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
CP70B1FF205K		485	5910-112-7431		1	
CV11A120		558	5910-556-9439		1	
CV11C450		215	5910-112-8247		2	
C107607		16			1	
C107638		262			1	
C109091		388			1	
C110093		589			1	
C110097		590			1	
C110182		728			1	
C110327		201			1	
C110539		257			1	
C111127		696			1	
C111759		743			1	
C111967		111			1	
C111990		21			1	
C112007		130			1	
C112182		265			1	
C115990		293			1	
C115991		269			1	
C109800		323			1	
D109874		591			1	
D109970		744			1	
D109975		1			1	
D110094		505			1	
D110098		389			1	
D110178		26			1	
D110317		132			1	
D111746		310			1	
D111748		27			1	
D111991		727			1	
D111993		131			1	
D111994		40			1	
D111995		37			1	
D111996		66			1	
D111997		42			1	
D111998		47			1	
D113126		721			1	
D113860		4			1	
D113873		2			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 **CONTRACT NO. N61339-29**

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
FHN20G		58		3	6	
F03G3RG00B		52	5920-280-5039		6	
H10C	WIQ	270	5935-280-2204		1	
H19C	WIQ	296	5935-258-1757		1	
H19CS	WIQ	730			1	
JJ-089		72	5935-192-4789		1	
J1301-3	Jan Hardware Mfg	71			1	
LH50PR5		69			1	
LH64PA5		70			1	
MRE14H	WIQ	357			1	
MRE20H	WIQ	110			1	
MRE34H	WIQ	447	5935-280-2202		1	
MRE41H	WIQ	153			1	
MR26W002DCMA		39			1	
MS15571-2		67	6240-155-8706	2	1	
MS16108-2		199			B	
MS24009		118			1	
MS24010		356			1	
MS24013		647			1	
MS24014		109			1	
MS24021		116			1	
MS24022		448			1	
MS24023		114			1	
MS24024		152			1	
MS35241-34		729			8	
MS31241-37		593			4	
MS35241-38		592			4	
MX-1530/U		80			4	
M36BS440-14CR	FLN	299			2	
M4P-LS	WIQ	271			1	
M4S-LRN	WIQ	648			1	
M5P-LSN	WIQ	731			1	
M56-LRN	WIQ	642			1	
M7P-LS	WIQ	297			1	
M7S-LRN	WIQ	162	5935-258-2920		1	
NBC -K15-8	Rotating Component	737			1	
NE-51		68			1	
RC20GF101K		247	5905-186-3008		1	
RC20GF102J		566	5905-195-6806		2	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC20GF103J		241			1	
RC20GF103K		672	5905-185-8518		1	
RC20GF104K		128	5905-195-6761		3	
RC20GF105J		673	5905-192-0390		2	
RC20GF105K		206	5905-192-3982			
RC20GF114J		567	5905-120-1174		1	
RC20GF115J		228	5905-279-1868		1	
RC20GF123J		570	5905-279-3502		2	
RC20GF123K		220	5905-190-8884			
RC20GF124K		583	5905-195-6500		1	
RC20GF125J		211	5805-190-8874		1	
RC20GF134J		503			1	
RC20CF152J		579	5905-279-1757		1	
RC20GF154J		354	5905-279-2522		2	
RC20GF155J		681			1	
RC20GF165J		573	5805-279-1872		1	
RC20GF183K		222	5905-190-8879		1	
RC20GF184K		231	5905-192-0662			
RC20GF185J		568	5905-279-1873		1	
RC20GF203J		239	5905-192-0649		1	
RC20GF205J		171	5905-107-4767		1	
RC20GF221J		657			1	
RC20GF222K		543	5905-171-2009		1	
RC20GF223K		334	59056-18-2987		2	
RC20GF224J		569	5905-192-0662		1	
RC20GF224K		230	5905-295-3409		4	
RC20GF225K		523	5905-239-0569		1	
RC20CGF45K		208	5905-279-2512		1	
RC20GF274K		545	5905-249-9491		1	
RC20GF275K		207	5905-279-1882		1	
RC20GF332K		502	5905-195-4502		3	
RC20GF334J		572	5905-279-2519		1	
RC20GF364J		232	5905-114-1928		1	
RC20GF433J		571	5905-279-3498		1	
RC20GF434J		533	5905-279-2518		1	
RC20GF470J		242	5905-537-6486		1	
RC20GF471J		529	5905-192-3973		1	
RC20GF471K		653	5905-171-2005		5	
RC20GF472K		550	5905-195-6451		1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

TABLE 9-4 NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC20GF473K		337	5905-295-3410		4	
RC20GF474J		669	5905-279-3515		2	
RC20GF474K		520	5905-185-6946		1	
RC20GF512J		581	5905-279-2019		2	
RC20GF513J		244	5905-279-3496		2	
RC20GF514J		546	5905-279-2516		1	
RC20GF561J		528	5905-195-6800		1	
RC20GF564K		524	5905-231-5840		1	
RC20GF623J		518	5905-249-3656		1	
RC20GF624J		690	5905-221-5641		1	
RC20GF681J		509	5905-195-6791		1	
RC20GF683J		555	5905-249-3661		1	
RC20GF683K		209	5905-254-7087		1	
RC20GF684K		687	5905-221-5842		1	
RC20GF753K		330			2	
RC20GF823K		243	5905-254-7097		1	
RC20GF824J		213	5905-221-5948		1	
RC20GF824K		527	5905-107-3214		1	
RC32GF105K		652			1	
RC32GF184J		691	5905-279-2597		1	
RC32GF223K		516	5905-299-2019		1	
RC32GF271K		331	5905-101-9957		2	
RC32GF471K		510	5905-120-2170		1	
RC32GF473K		525	5905-102-2444		1	
RC32GF623J		233	5905-299-2099		1	
RC32GF751J		205			1	
RC32GF823K		519	5905-537-6463		2	
RC42GF100K		682			1	
RC42GF103J		531	5905-185-8516		2	
RC42GF103K		338			1	
RC42GF104K		224	5905-171-1978		10	
RC42GF122K		38			1	
RC42GF162J		554	5905-665-6043		1	
RC42GF181K		335			1	
RC42GF183K		526	5905-249-4227		1	
RC42GF202J		552	5905-256-8355		1	
RC42GF270J		668	5905-279-1747		2	
RC42GF270K		666	5905-279-1925		2	
RC42GF332J		557	5905-257-0926		3	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 **CONTRACT NO. N61339-29**

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC42GF332K		511	5905-195-6748		2	
RC42GF334K		678			1	
RC42GF362J		553	5905-195-6750		1	
RC42GF472J		575	5905-257-0937		1	
RC42GF472K		677	5905-195-6449		1	
RC42GF473K		237	5905-190-8873		3	
RC42GF513J		547	5905-254-7708		2	
RC42GF513K		223			1	
RC42GF682J		212	5905-279-2528		1	
RC42GF682K		512	5905-279-2295		2	
RC42GF683K		234	5905-254-7090		2	
RC42GF822K		515	5905-249-4198		1	
RG-62/U		82	6145-161-0913		69-1/4 in.	
RG-71/U		261	6145-161-0916		9 in.	
RG-9/U		10			84 in.	
RH50G502H		442			1	
RN25X6003J		173			1	
RS-5	DABU	556	5905-644-9438		1	
RV4NAVSD103A		139			1	
RV4NAVSD104A		41	5905-518-7047		2	
RV4NAVSD10SA		140			2	
RV4NAVSD251A		186			1	
RV4NAVSD254A		492			1	
RV4NAVSD503A		142			5	
RV4NAVSD504A		46	5905-642-3576		3	
RW20G392		343			1	
TS101P01		606	5935-260 -0517		4	
TS102P01		186	5935-260-0516		17	
TS102U02		174	5960-272-9094		10	
TS102U03		358	5960-295-7652		7	
TS103P01		188	5635-160-1365		7	
TS103U02		176	5960-254-3004		7	
UG-1094/U		155	5935-665-5718		5	
UG-119/UP		312			1	
UG-160B/U		101			1	
UG-203/U		260	5935-149-5358		1	
UG-21B/U		8	5935-149-4236		3	
UG-260B/U		81	5935-149-4055		6	
UG-625A/U		73			2	
U2463	MRQ	287			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
X-1942-X	CGT	284			1	
X2111-C-B0	CGT	30			2	
0-520-4	TTM	736			1	
0A2WA		468	5960-262-0964	2	1	
1N126		340			1	
1N23C		311		1	1	
1N69		249	5960-194-9408	3	3	
106	ZE	536			2	
11014-11	SOCH	23			4	
12-11-205-12	SOCH	22			4	
12AT7WA		182	5960-262-0167		2	
12LHA401-62	EN	723			2	
125-3-2	RAY	35			1	
13	ULC	278			2	
15Y	TTE	603	5960-270-8165		1	
156	TRII	15	5965-128-8756		1	
2K45		300	5960-188-8625	1	1	
200-AC	HALK	5			1	
210406-00	SH	122			2	
2161	SHHI	218			12	
22NA217-22-62	EN	722			12	
2600-4SW	CLC	3			2	
3Y	TTE	610			3	
333	ZE	393			3	
42	TTE	604			5	
46A1	VIEC	535			1	
SR4WGA		605	5960-262-1703	1	1	
5S3-1	CLC	25			2	
5S5-14	CLC	24			2	
52-012-062-0250	AG	305			2	
5651		633		1	1	
5751		623	5960-193-5145	2	2	
5814A		401			3	
6AH6		464	5960-166-7667	1	1	
6AU6WA		183	5960-262-0152	6	6	
6D4		395	5960-108-0283	1	1	
6LWGB		612	5960-262-0161	1	1	
6X4W		634	5960-272-9182	2	2	
6002-1A	AAEP	273			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 **CONTRACT NO. N61339-29**

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
6005/6AQ5W		362	5960-669-6861	2	2	
6080WA		613	5960-262-0181	2	2	
6100/6C4WA		180		3	4	
6080A	BBR	203			4	
70-4-2	RAY	34	5355-644-2083		5	
7506	HAW	12	5935-295-5351		1	
7524	HBCO	48			1	
7547	MAW	13	5935-259-9784		1	
773	WIQ	386			5	
90-3-2	RAY	33			5	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

TABLE 9-5 REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
A101	B109806	326	CR302	1N69	249	C204	CP10A1EF 104M	418
A102	B111749	348	CR501	1N23C	311	C205	CP11A3EE 104M	416
A201	B111026	392	C101	CM20B101J	352			
A202	AK5100	489	C102	CP09A1EF 103K	384	C206	CM20B151J	585
A203	D110094	505	C103	CP11A1EF 104K	381	C207	CM35B912J	582
A301	C110327	201				C208	CM35B912J	584
A302	AK5100	135	C104	CM20B101K	332	C209	CM20B151J	517
A303	AK5100	163	C105	CP05A1EF 104K	383	C210	CP61B1EF 254M	480
A304	C111987	111	C106	CP11A1EF 104K	380	C211	CP70B1FF 205K	485
A305	B107624	314						
A401	C111126	663	C107	CM35B103K	336	C212	CP61B1EF 503K	429
A402	AK5100	704	C108	CM20B101K	341	C213	CM20B101J	574
A403	D113126	721	C109	CP05A1EF 104K	382	C214	CM20B300J	549
A501	B111756	123	C110	CP55B1EF 504K	376	C215	CM35B472K	433
A801	C107607	16				C216	CP11A3EF 104K	500
B401	NBC-K15-8	737	C201	CP61B1EF 254M	422			
CR101	1N126	340	C202	CP10A1EF 104M	412	C217	CV11C450	559
CR201	1N69	565				C218	CV11A120	558
CR301	1N69	250	C203	CP11A3EB 105M	417	C219	CM20B470K	501

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
C220	1B1EF 104M	496	C406	CP10A1EE 474K	697	E208	TS103U02	460
C221	CK63Y103Z	504	C407	CE41C250Q	597	E209	T102U03	442
C223	CP05A1KF 223K	580	C408	CE41C100Q	598	E210	TS10SU02	461
C224	CM30B821K	551	C411	CP09A1EC 223K	654	E211	TS102U02	463
C301	CP41B1FF 405K	252	C412	CE41C500Q	594	E212	MX-1530/U	80
C302	CP41B1FF 405K	253	C413	CY41C500Q	595	E213	MX-1530/U	84
C303	CP05A1EF 104M	158	C415	CP10A1EE 474K	699	E301	TS102U02	179
C304	CP05A1EC 104K	127	DS401	MS15571-2	67	E302	TS102U02	178
C308	CK63Y103Z	240	DS402	NE-51	68	E303	TS102U02	175
C309	CV11C450	215	E101	TS102U03	361	E304	TS103U02	176
C311	CM20B680J	214	E102	TS102U03	360	E305	TS102U02	177
C312	CK63Y103Z	210	E103	TS102U03	359	E306	TS102U02	174
C314	CK63Y103Z	172	E202	TS102U02	396	E307	MX-1530/U	88
C401	CE41C250Q	590	E203	TS103U02	397	E308	MX-1530/U	92
C402	CP10A1EE 474K	700	E204	TS103U02	399	E311	B111744	308
C403	CE41C100Q	599	E205	TS102U02	398	E312	B111736	309
			E206	TS102U02	458	E403	TS103U02	622
			E207	TS102U03	459	E404	TS102U03	632
						E405	TS102UP3	631
						E407	TS103U02	621

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
E408	TS102U02	630	J208	MS16108-2	441	J501	A107612	17
E801	B107609	20	J301	MS24023	114	K201	BP-16431	426
F401	F03G3R00B	52	J302	UG-1094/U	156	M301	MR26W002 DCMA	39
F402	F03G3R00B	53	J303	M7S-LRN	162	N401	B116741	288
F403	F03G3R00B	54	J304	UG-1094/U	157	P101	MS24010	356
F404	F03G3R00B	55	J305	UG-1094/U	155	P201	MS24022	448
F405	F03G3R00B	56	J306	U-625A/U	120	P202	UG-260B/U	85
F406	F03G3R00B	57	J307	MS16108-2	200	P203	UG-260B/U	81
HR401	B115985	272	J308	UG-625A/U	73	P301	MS24024U	152
HT101	156	15	J309	UG-160B/U	101	P302	UG-260B/U	295
J101	MS24009	118	J310	A107612	319	P303	M7P-LS	297
J102	JJ-089	72	J311	B107623	315	P304	UG-260B/U	89
J201	MS24021	116	J316	MS16108-2	199	P305	UG-260B/U	93
J202	UG-1094/U	484	J401	MS16108-2	649	P306	UG-260B/U	259
J203	UG-1094/U	495	J402	MS16108-2	650	P309	UG-21B/U	8
J204	MS16108-2	437	J403	MS24013	647	P310	UG-21B/U	102
J205	MS16108-2	438	J404	M5S-LRN	642	P312	UG-203/U	260
J206	MS16108-2	439	J405	M4S-LRN	648	P403	MS24014	109
J207	MS16108-2	440	J406	7524	48	P404	M5P-LSN	731

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
P405	M4P-L1	271	R115	RV4NAVSD 504A	46	R219	RC20GF124K	503
P406	7506	12	R201	RC42GF822K	515	R220	B113113	43
P601	UG-21B/U	9	R202	RC42GF332K	514	R221	RC20G134J	503
P701	7547	13	R203	RC42GF332K	511	R222	C20GF224K	577
RT237	46A1	535	R204	RCR2GF682K	512	R223	RC20GF514J	546
R101	RC20GF 223K	353	R205	RC42AF682K	513	R224	RC42GF513J	647
R102	RC20GF 154J	354	R206	RC20GF473K	530	R225	RC42GF513J	548
R103	RC20GF 753K	330	R207	RC32GF223K	516	R226	RC20GF433J	571
R104	RC32GF 271K	331	R208	RC20GF561J	528	R227	RV4NAVSD 503A	493
R105	RC20GF 753K	333	R209	RC32GF823K	519	R228	RC20GF104K	532
R106	RC20GF 223K	334	R210	RC20GF623J	518	R229	RC20GF512J	588
R107	RC42GF181K	335	R212	RC20GF104K	534	R230	B111027	36
R108	RC20GF473K	337	R213	RC20GF222K	543	R232	RC20GF102J	566
R109	RC42GF103K	338	R214	B111992	45	R233	RC20GF123J	586
R110	RW20G392	343	R215	RC20GF434J	533	R234	RC20GF102J	587
R111	RC32GF271K	339	R216	RC20GF165J	573	R235	RC20GF123J	570
			R217	RC20GF274K	545	R236	RC20GF512J	581
			R218	RV4NAVSD 104A	494	R238	RC32GF473K	525

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
R239	RC20GF681J	509	R258	RC20GF334J	572	R303	RC20GF183K	222
R240	RC32GF823K	522	R259	RC20GF472K	550	R304	RC20GF123K	221
R242	RC20GF 473K	521	R260	RC42GF103J	531	R305	RC20GF123K	220
R243	RC20GF 474K	520	R261	RC20GF471J	529	R306	RC20GF224K	246
R244	RH50G502H	442	R262	RC20GF224J	569	R307	RV4NAVSD 105A	144
R245	RC32GF471J	510	R263	RC20GF185J	568	R308	RC20GF823K	243
R246	RC42GF 183K	562	R264	RC42GF332J	557	R309	RC20GF513J	244
R247	RC20GF 332K	542	R265	RC42GF332J	564	R310	RC20GF513J	245
R248	RC20GF 225K	523	R266	RC42GF332J	563	R312	RC42GF683K	236
R249	RC20GF 824K	527	R267	RC20GF114J	567	R313	RV4NAVSD 503A	142
R250	RV4NAVSD 254A	492	R268	RC20GF152J	579	R314	RC42GF683K	234
R252	RC42GF472J	575	R269	RS-5	556	R315	B112009	44
R253	RC20GF154J	576	R270	RC20GF683J	555	R316	RC20GF203J	239
R254	RC42GF103J	544	R272	RC20GF332K	502	R317	RV4NAVSD 503A	143
R255	RC42GF162J	554	R273	RC20GF332K	578	R318	RC20GF103J	241
R256	RC42GF362J	553	R274	RC20GF564K	524	R319	RC20GF224K	230
R257	RC42GF202J	552	R278	RV4NAVSD 104A	41	R320	RC20GF105K	206
			R301	RC20GF683K	209	R322	RC20GF364J	232
			R302	RV4NAVSD 504A	138			

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
R323	RV4NAVSD 504A	141	R347	RC42GF104K	226	R410	RC42GF334K	678
R324	RC20GF184K	231	R348	RC42GF104K	225	R411	RC20GF105J	673
R325	RC20GF184K	235	R350	B116392	229	R412	RC20GF221J	657
R326	RC32GF623J	233	R352	RC42GF104K	224	R413	RC20GF474J	669
R327	RN25X6003J	173	R353	RV4NAVSD 103A	139	R414	R4NAVSD 503X	708
R328	RC20GF245K	208	R354	RC20GF115J	228	R415	RC20GF474J	679
R329	RC20GF275K	207	R356	RC42GF513K	223	R416	RC20GF471K	653
R330	RC20GF104K	128	R357	RC32GF751J	205	R417	RC42GF104K	676
R335	RV4NAVSD 105A	140	R358	RV4NAVSD 251A	166	R418	RC20GF471K	659
R336	RC20GF101K	247	R359	C-173A	169	R419	RC32GF105K	652
R337	RC42GF473K	237	R360	C173B	170	R420	RC42GF472K	677
R338	RC42GF473K	238	R399	RC42GF122K	38	R421	RC20GF471K	658
R339	RC20GF470J	242	R403	RC20GF155J	681	R422	RC42GF270J	666
R340	RC20GF105K	248	R404	RC42GF473K	683	R423	RC30GF624J	690
R342	RC20GF824J	213	R405	RC20GF471K	656	R424	RC20GF105J	689
R343	RC20GF125J	211	R406	RC20GF471K	655	R425	RC20GF103K	672
R344	RC42GF682J	212	R407	RC20GF473K	684	R426	RC32GF184J	691
R345	RC20GF205J	171	R408	RC42GF270K	668	R427	B116391	671
R346	RC42GF104K	227	R409	RC42GF270J	685	R428	RV4NAVSD 503A	707

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
R429	B116403	680	TB201	C110093	589	V211	6100/6C4WA	469
R430	RC42GF104K	670	TB301	B111758	251	V301	6100/6C4WA	185
R431	RC42GF270K	667	TB401	C111127	696	V302	6AU6WA	184
R432	RC20GF224K	688	TB501	B111755	129	V303	6100/6C4WA	181
R433	RC20GF684K	687	T401	B111677	643	V304	12AT7WA	182
R434	RC42GF104K	651	T402	B111137	600	V305	6AU6WA	183
R435	RC42GF104K	686	V101	6AU6WA	364	V306	6100/6C4WA	180
R436	RC42GF104K	675	V102	6AU6WA	363	V307	2K45	300
R437	RC42GF104K	674	V103	6005/6AQ5W	362	V401	5R4WGA	605
R438	RC42GF100K	682	V201	6D4	395	V402	6080WA	613
S201	D111995	37	V202	6AU6WA	400	V403	5751	624
S301	D111994	40	V203	5814A	401	V404	6X4W	635
S302	D111997	42	V204	12AT7WA	403	V405	6X4W	634
S303	D111993	47	V205	6AU6WA	402	V406	6L6WGB	612
S401	D111996	66	V206	6AH6	464	V407	5751	623
S402	13	709	V207	6005/6AQ5W	465	V408	5651	633
S403	13	278	V208	5814A	466	V410	6080WA	614
TB101	B111988	355	V209	OA2WA	468	W201	B112008-4	79
TB102	B109807	342	V210	5814A	467	W202	B112008-3	83

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15 X 12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
W301	B111985	100	XV202	TS102P01	404	XV403	TS103P01	628
W302	B111986	258	XV203	TS103P01	405	XV404	TS102P01	638
W303	B112008-2	87	XV204	TS103P01	407	XV405	TS102P01	637
W304	B112008-1	91	XV205	TS102P01	406	XV406	TS101P01	615
W305	B116408	322	XV206	TS102P01	470	XV407	TS103P01	625
W601	B116397	11	XV207	TB102P01	471	XV408	TS102P01	636
W701	B116390	7	XV208	TS103P01	472	XV410	TS101P01	617
CR501	UG-119/UP	312	XV209	TS102P01	474			
XDS401	LH50PR5	69	XV210	TS103P01	473			
XDS402	LH64PA5	70	XV211	TS102P01	475			
XF401	FHN20G	58	XV301	TS102P01	191			
XF402	FHN20G	59	XV302	TS102P01	190			
XF403	FHN20G	60	XV303	TS102P01	187			
XF404	FHN20G	61	XV304	TS103P01	188			
XF405	FHN20G	62	XY305	TS102P01	189			
XF406	FHN20G	63	XV306	TS102P01	186			
XV101	TS102P01	387	XV307	B116396	301			
XV102	TS102P01	366	XV401	TS101P01	606			
XV103	TS102P01	365	XV402	TS101P01	616			

SECTION X

DRAWINGS

10-1. DRAWINGS AND PHOTOGRAPHS. (See list of illustrations.)

10-2. CABLING DIAGRAM. (see figure l0-1.) This diagram Indicates mating plugs, connectors, and the destination of each cable. This information is very helpful in determining the proper connection for plugs or connections which have been disconnected and where a doubt exists as to their proper destination.

10-3. FUNCTIONAL BLOCK DIAGRAM. (see figure 10-18.) The simplified functional block diagram to which reference is made pertains to the trainer as a complete unit. The diagram indicates circuit and tube functions, tube types, reference symbol numbers, and signal flow information. See Section V1, Theory of Operation, for a description of the circuitry involved.

10-4. SCHEMATIC DIAGRAM. (See figure 10-19.) The schematic diagram Illustrates the electrical wiring of the trainer. It also provides signal flow information, component reference numbers and values, connector pin and wiring details, waveshapes; and other information helpful in maintaining the trainer.

10-5. ALPHABETICAL INDEX. The alphabetical index in this section lists all subjects and illustrations mentioned or described in this handbook. Reference is made to their corresponding page and paragraph or figure number.

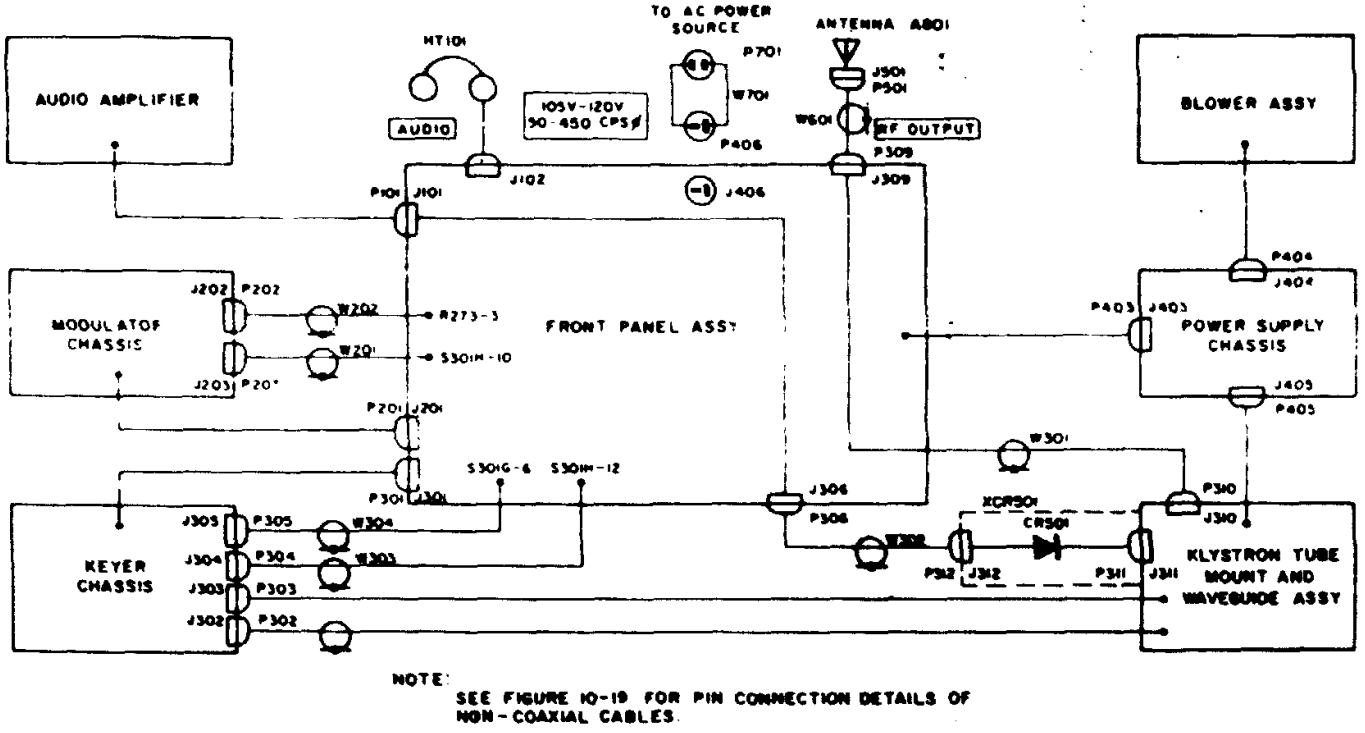


Figure 10-1. Trainer Cabling Diagram.

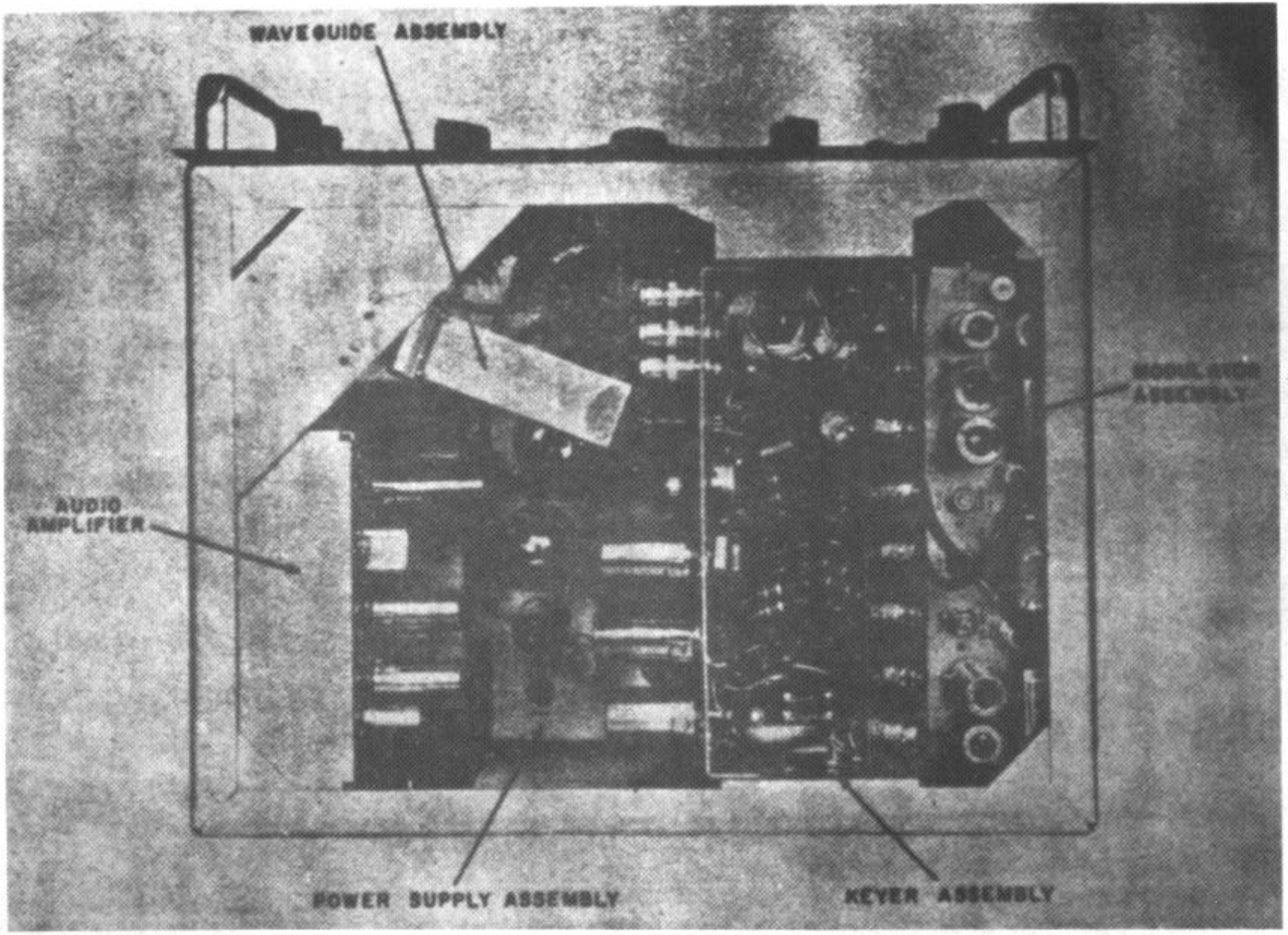


Figure 10-2. Trainer Less Blower Assembly and Dust Cover, Top View.

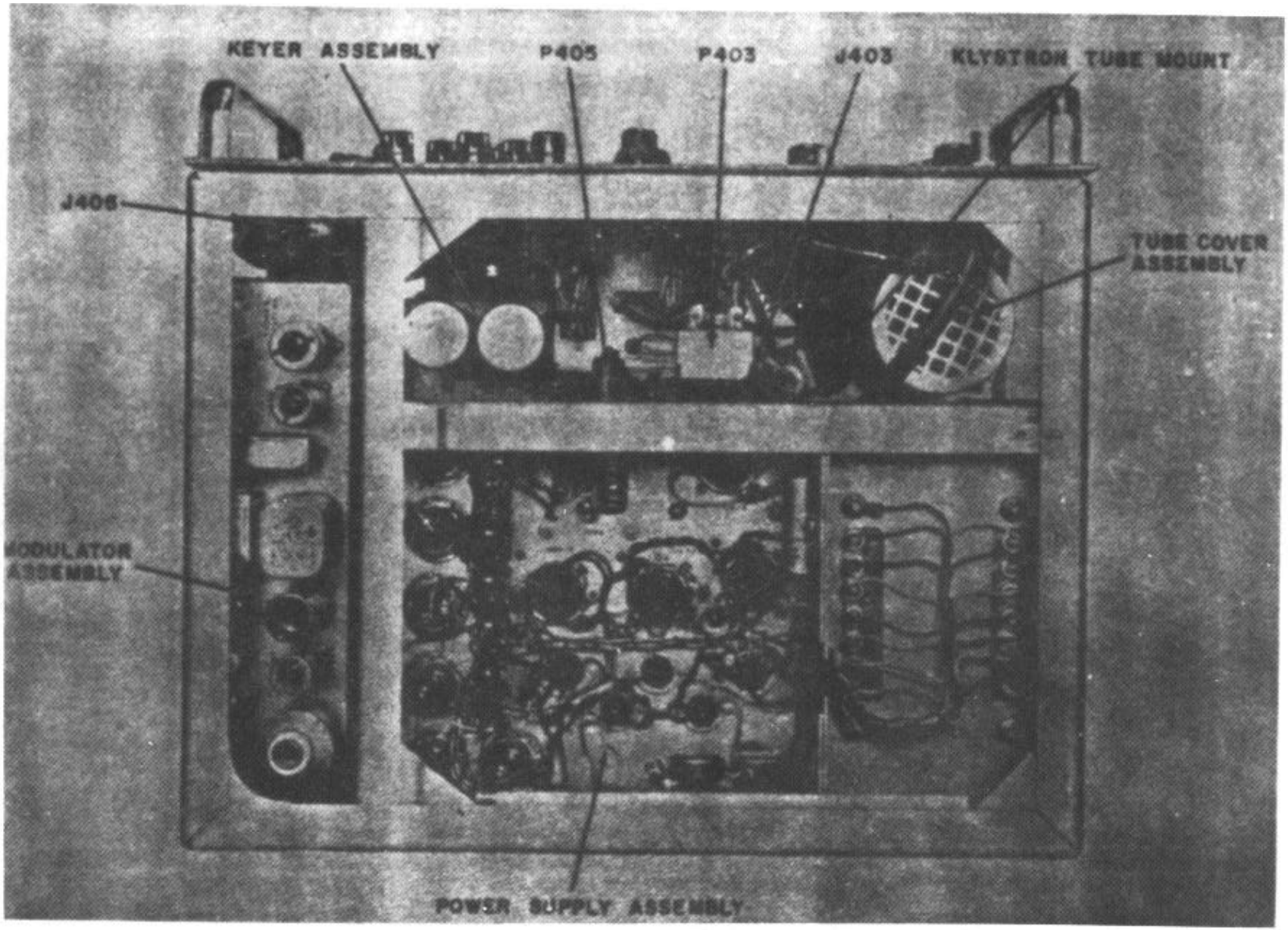
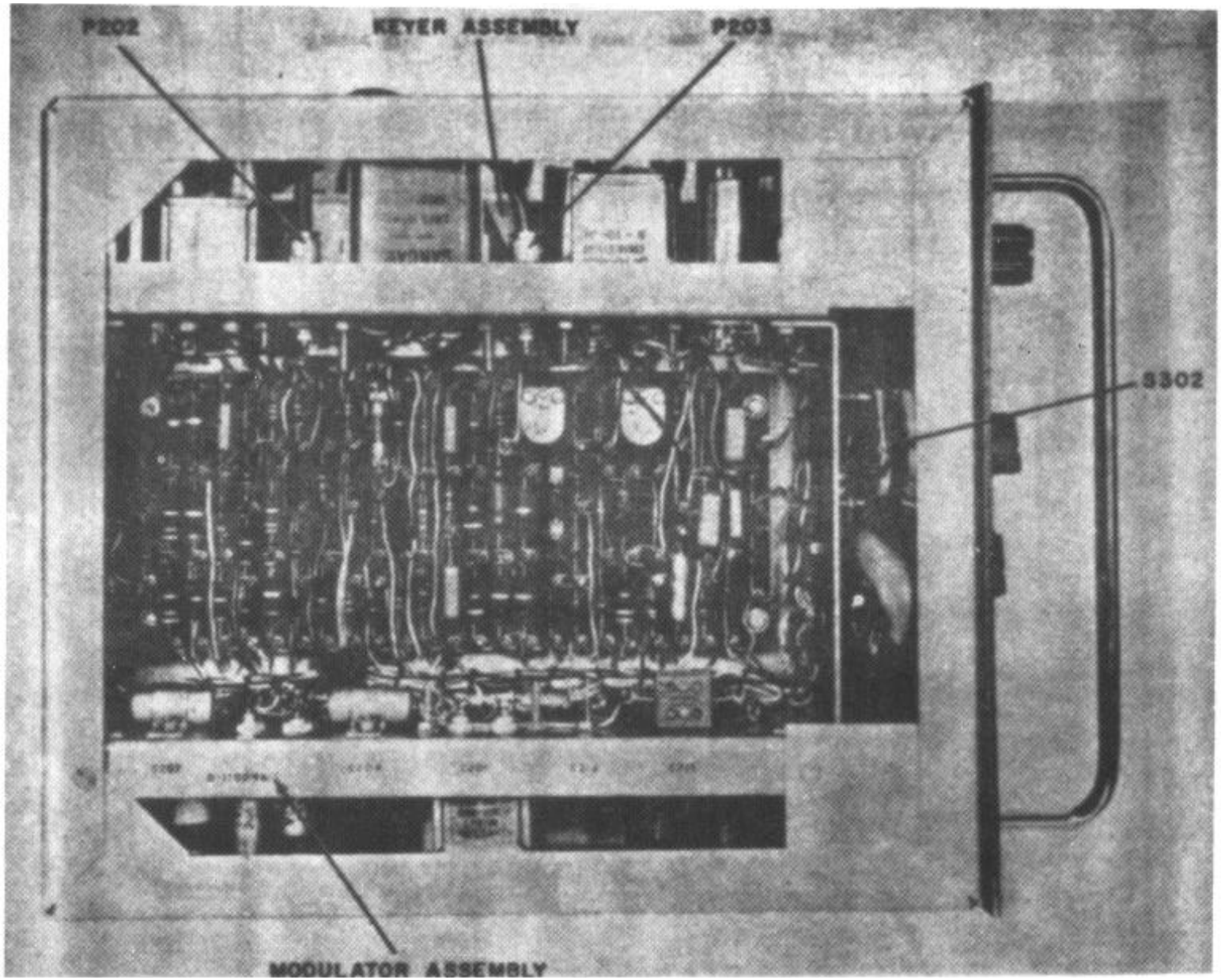


Figure 10-3. Trainer Less Dust Cover, Bottom View.



Fire 10-4. Trainer Less Dust Cover, Left Side View.

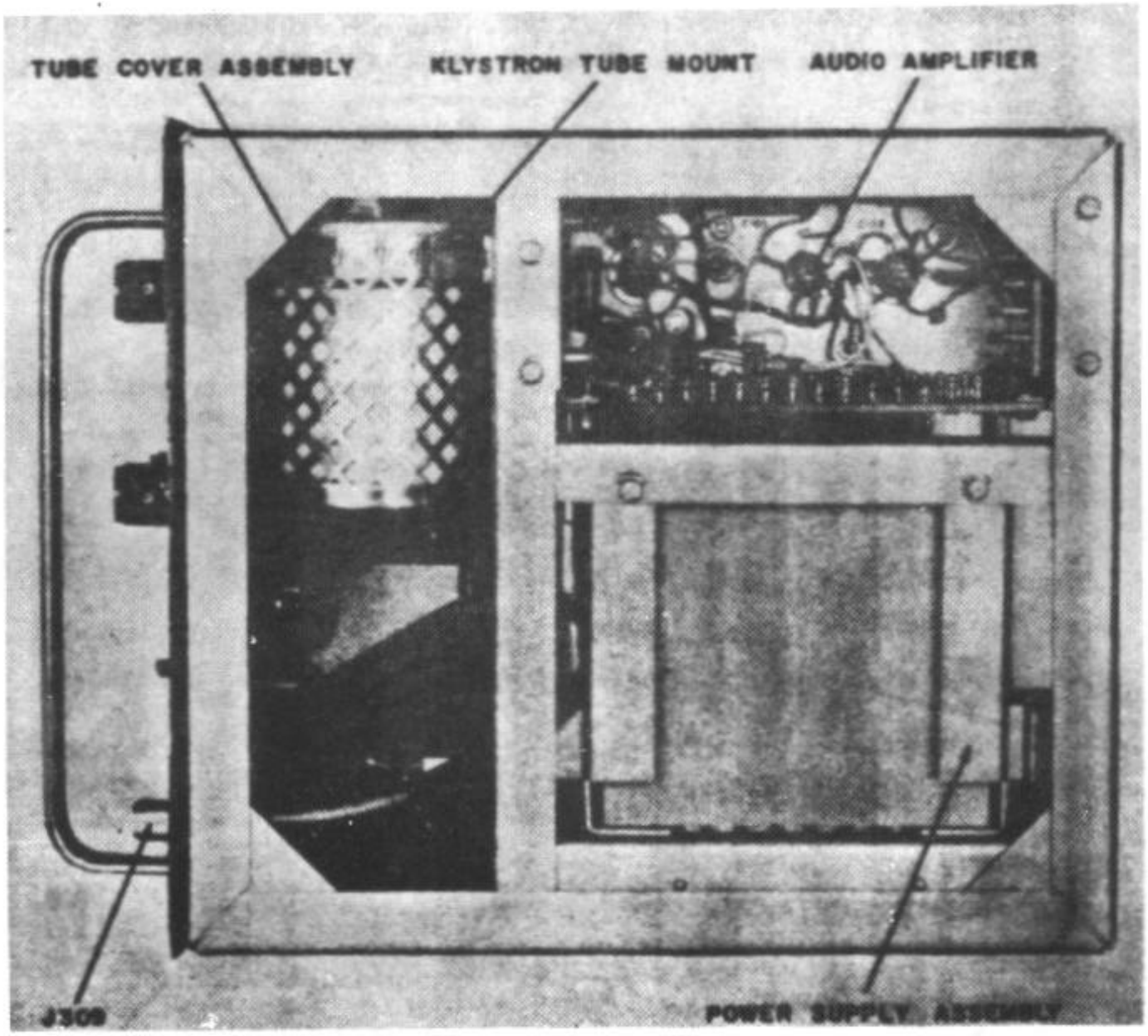


Figure 10-5. Trainer Less Dust Cover, Right Side View.

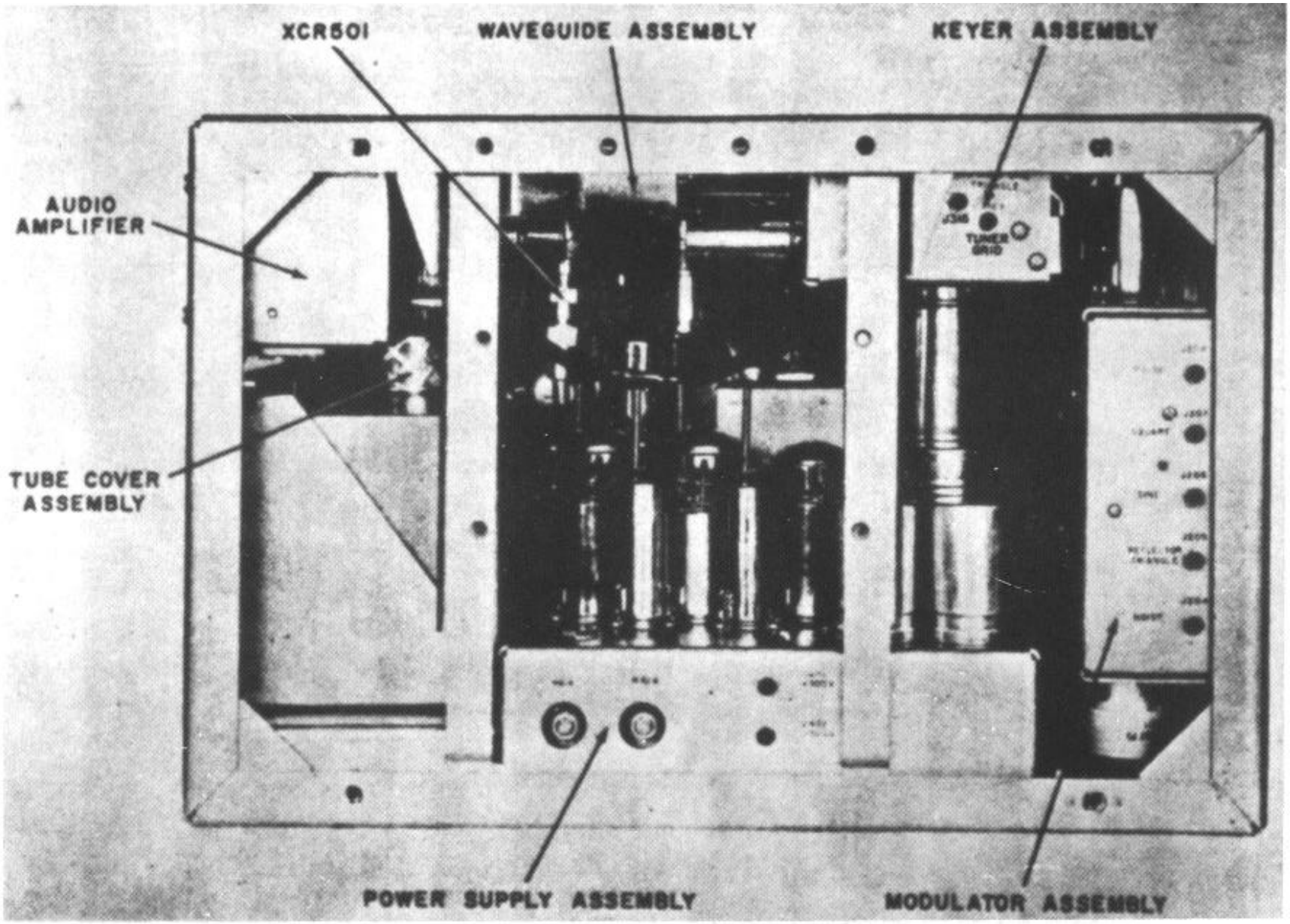


Figure 10-6. Trainer Less Blower Assembly and Dust Cover, Rear View.

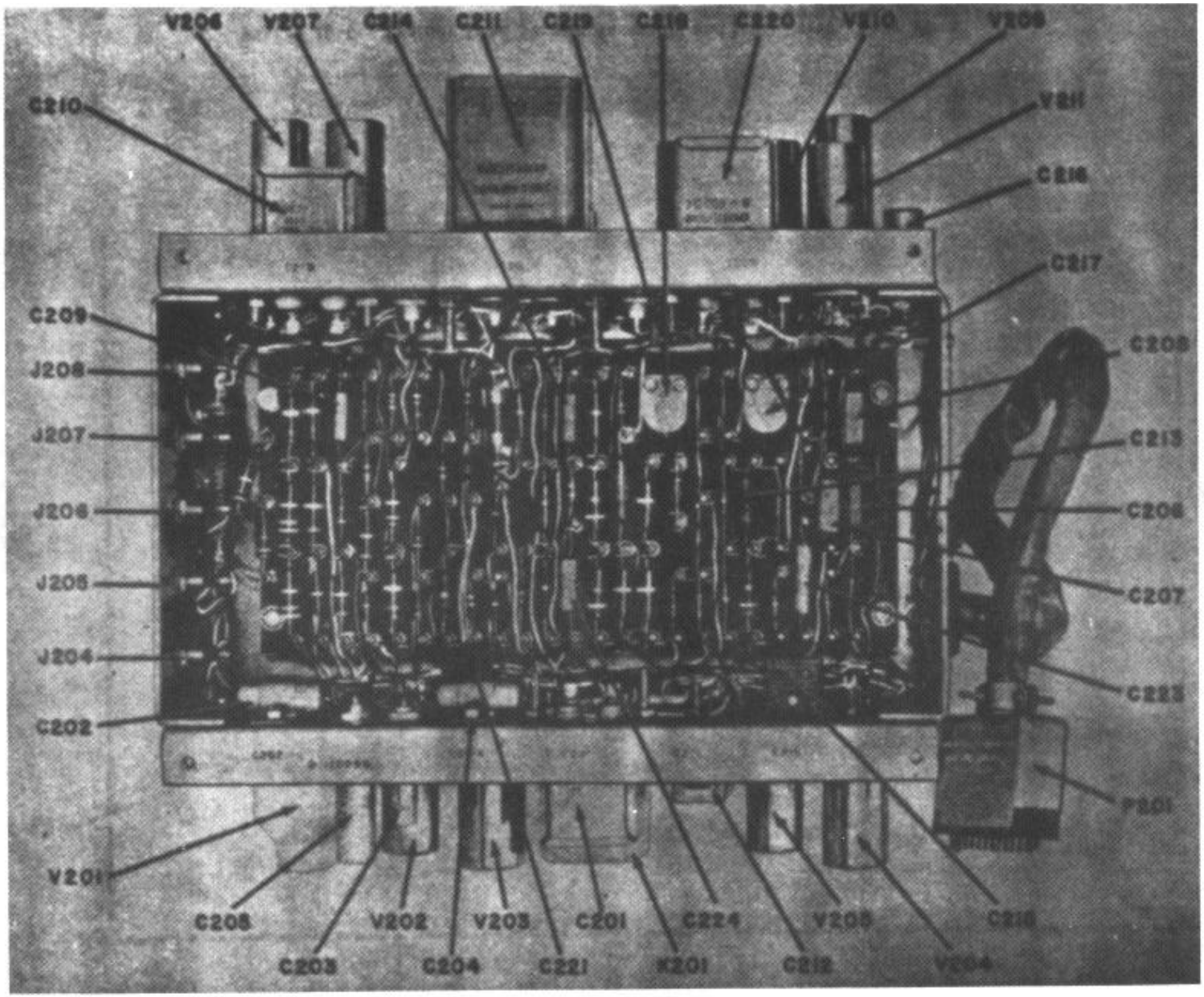


Figure 10-7. Modulator Chassis, Bottom View (Sheet 1 of 2).

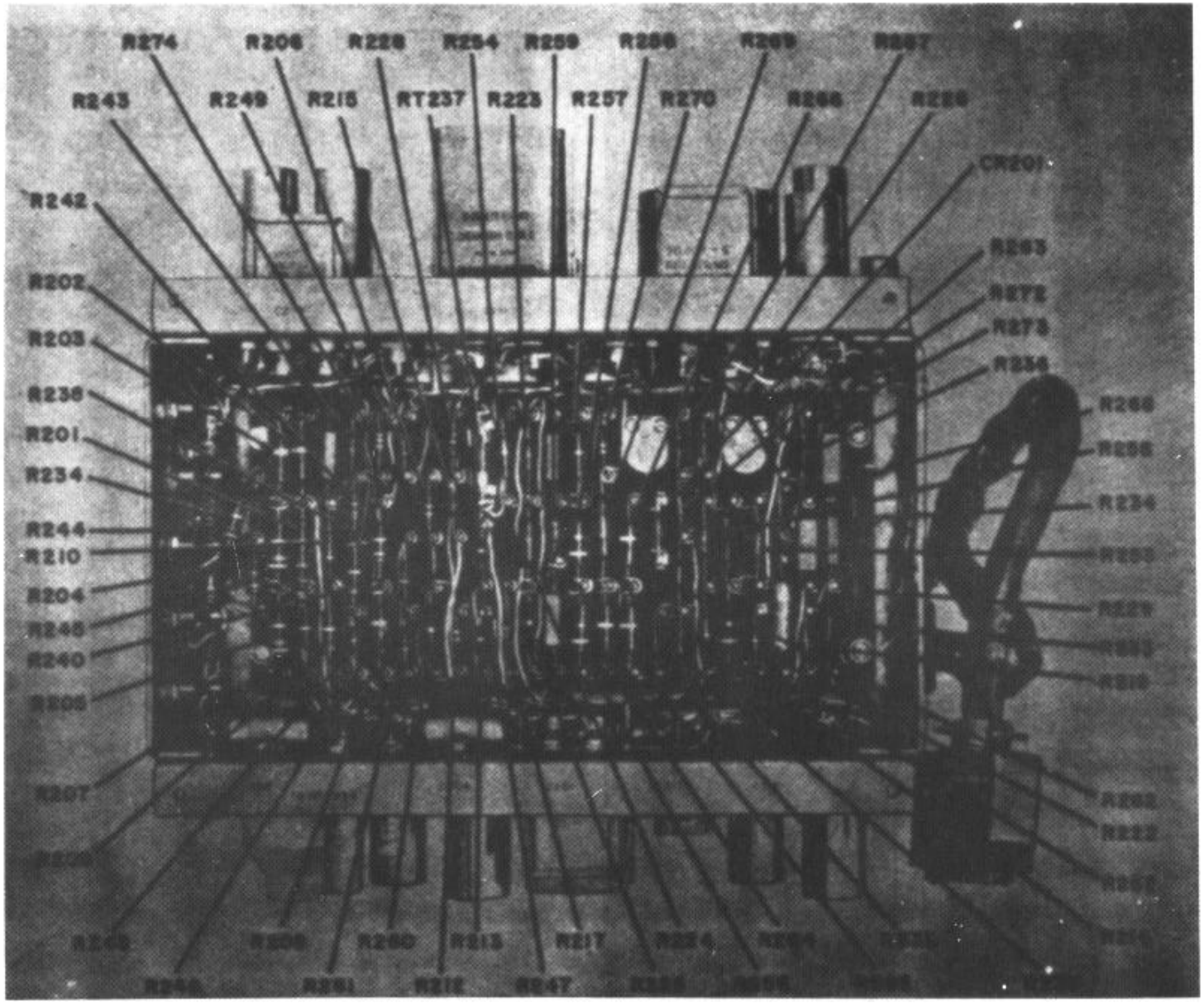


Figure 10-7. Modulator Chassis, Bottom View (Sheet 2 of 2).

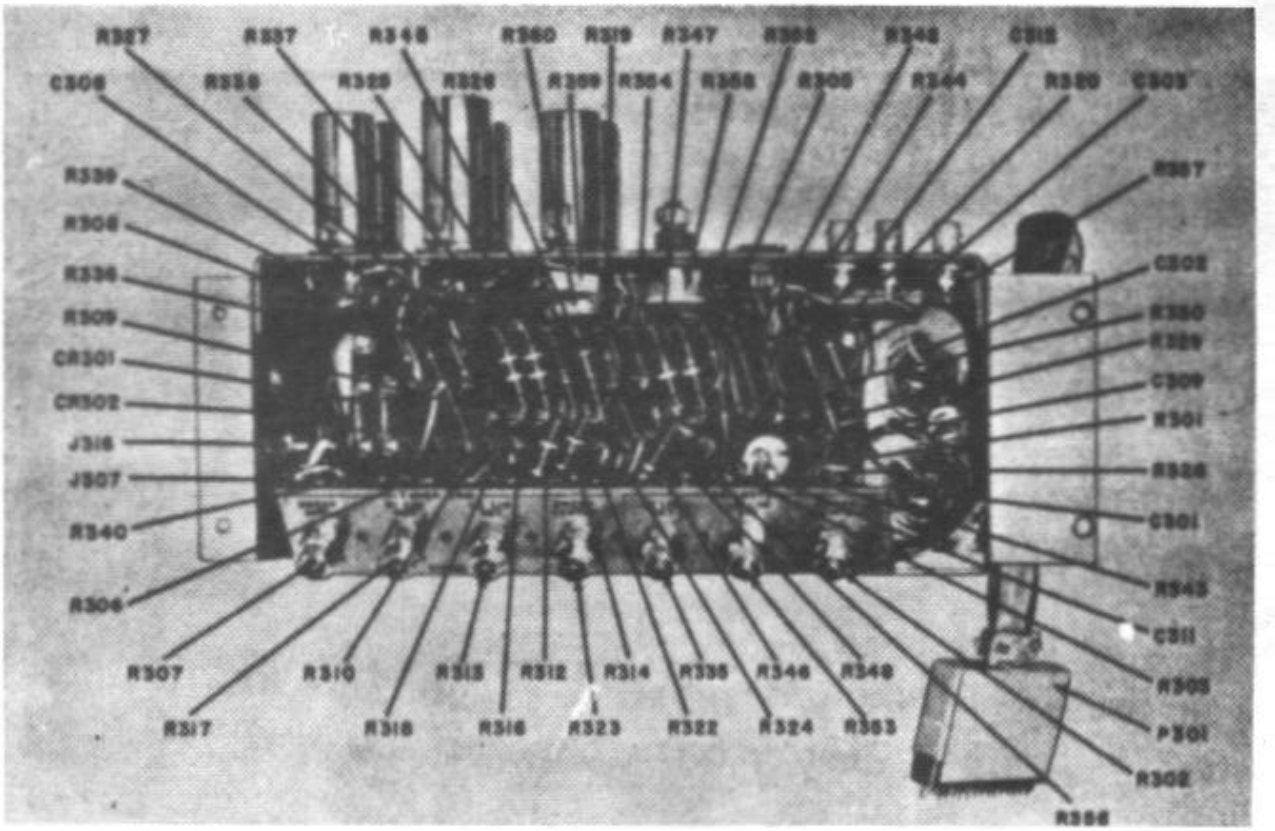


Figure 10-8. Keyer Chassis, Bottom View.

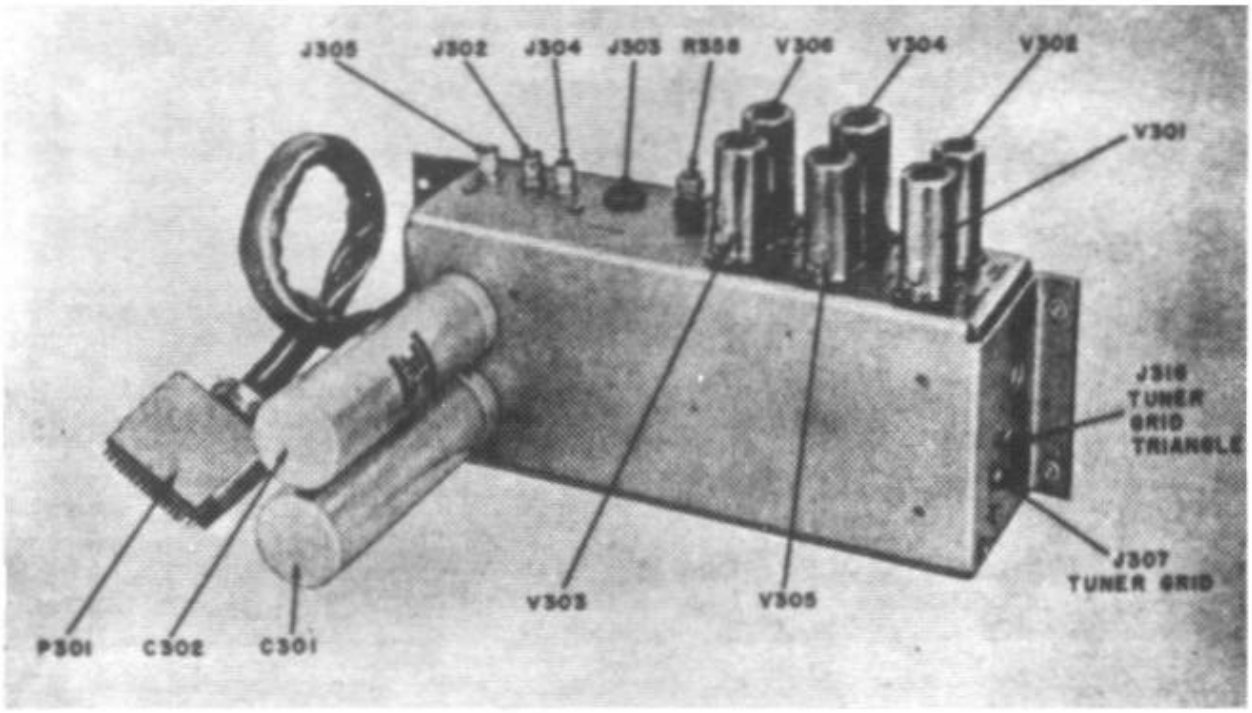


Figure 10-9. Keyer Chassis, Oblique View.

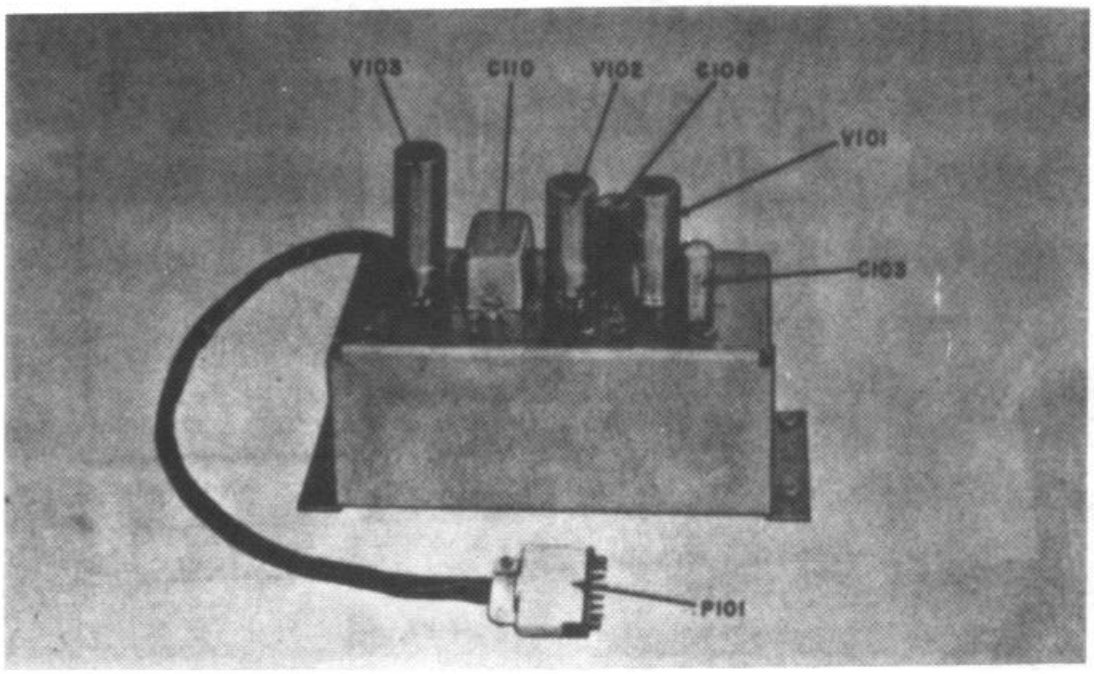


Figure 10-10. Audio Amplifier Chassis, Top View

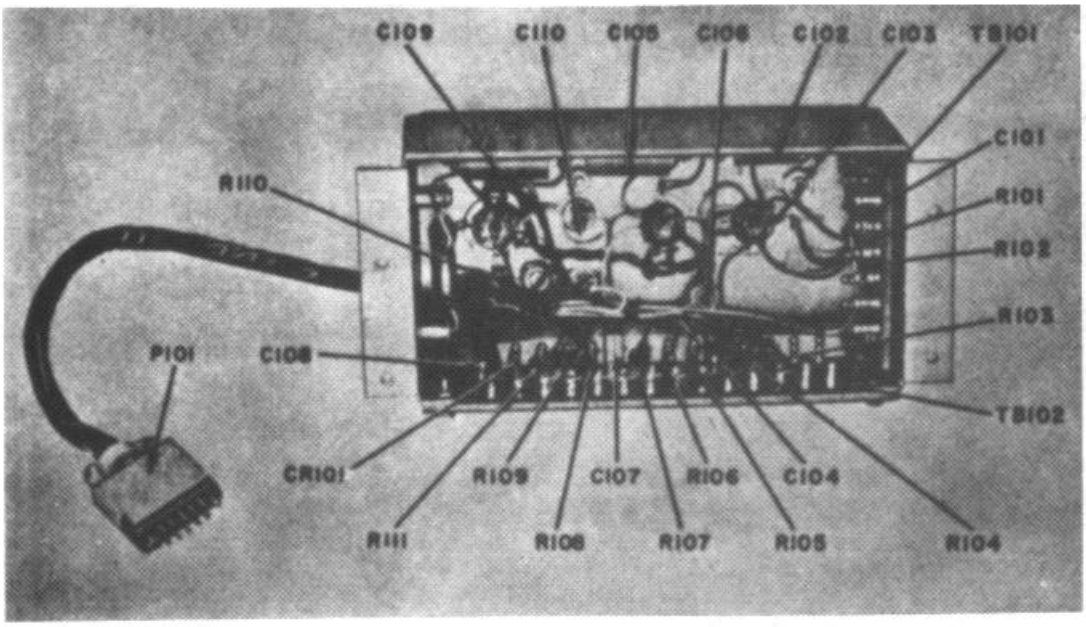


Figure 10-11. Audio Amplifier Chassis, Bottom View

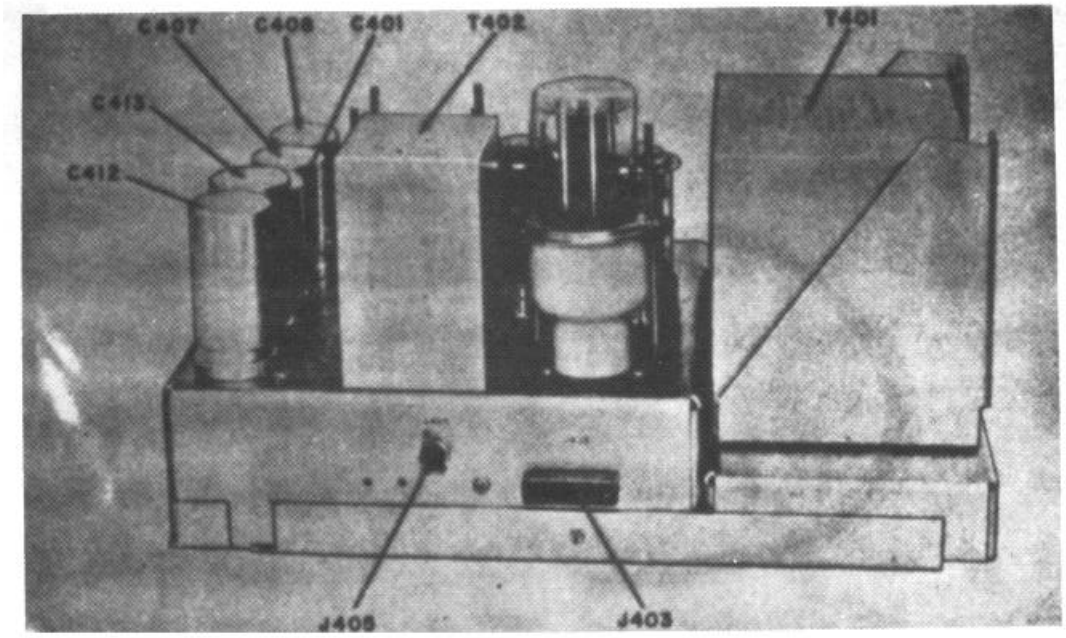


Figure 10-12. Power Supply Chassis, Front Top View

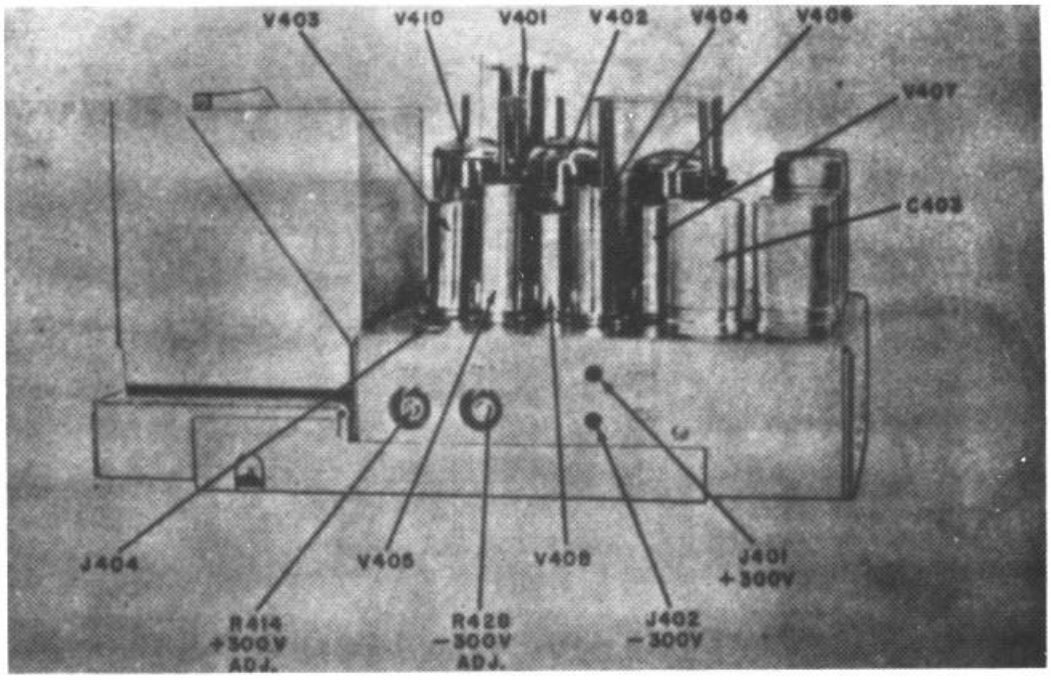


Figure 10-13. Power Supply Chassis, rear top View

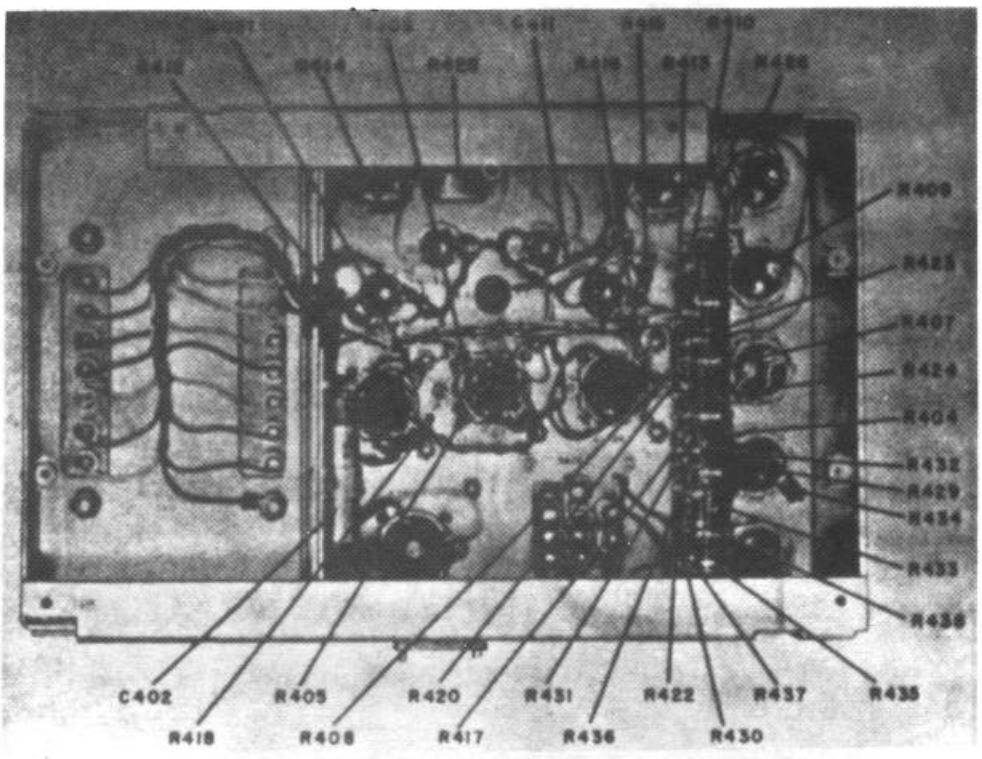


Figure 10-14. Power Supply Chassis, Bottom View

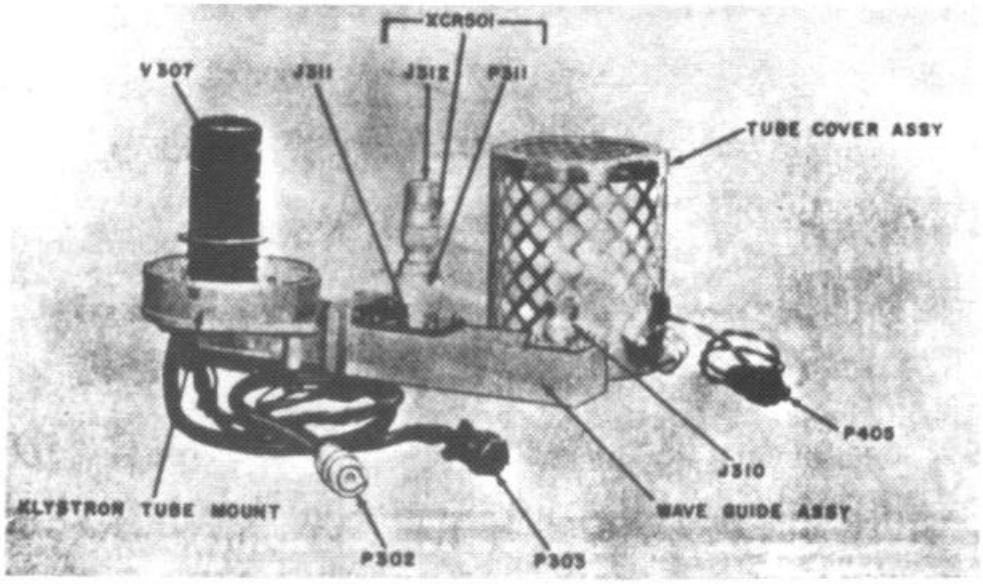


Figure 10-15. Klystron Tube Mount and Waveguide Assembly

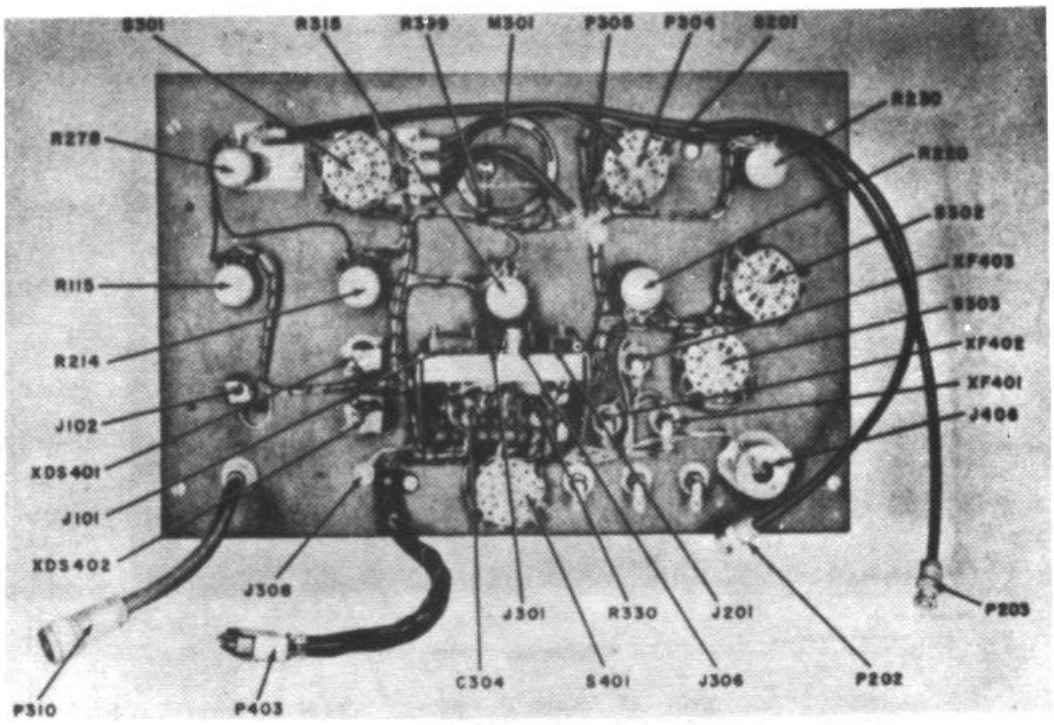


Figure 10-16. Front Panel, Rear View

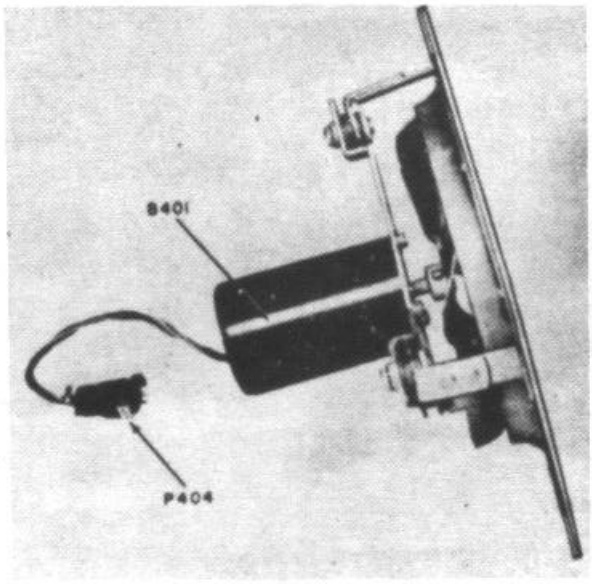


Figure 10-17. Blower

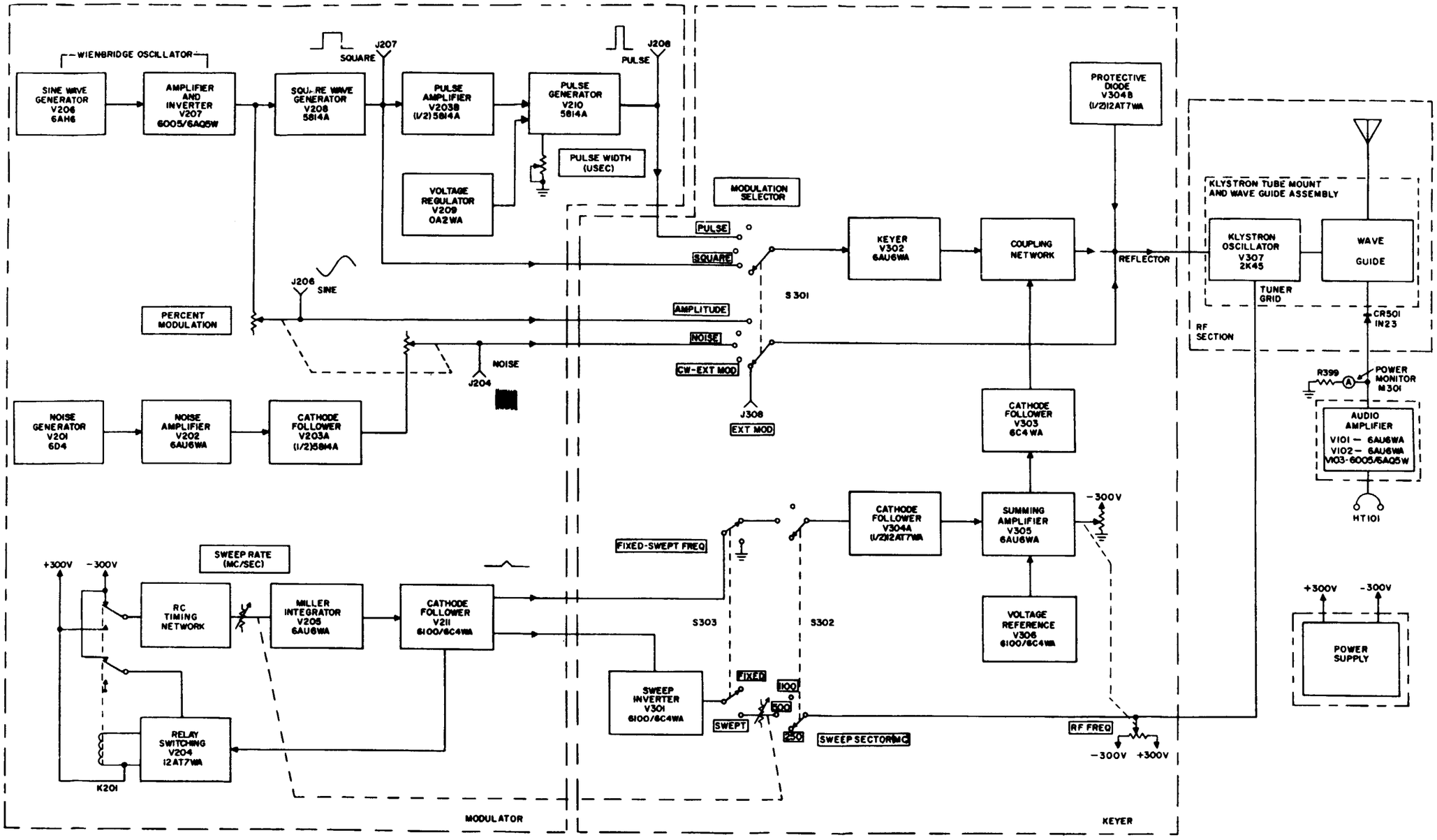


Figure 10-18. Radar Signal Interference Trainer (X-Band) Device 15X12, Simplified Functional Block Diagram

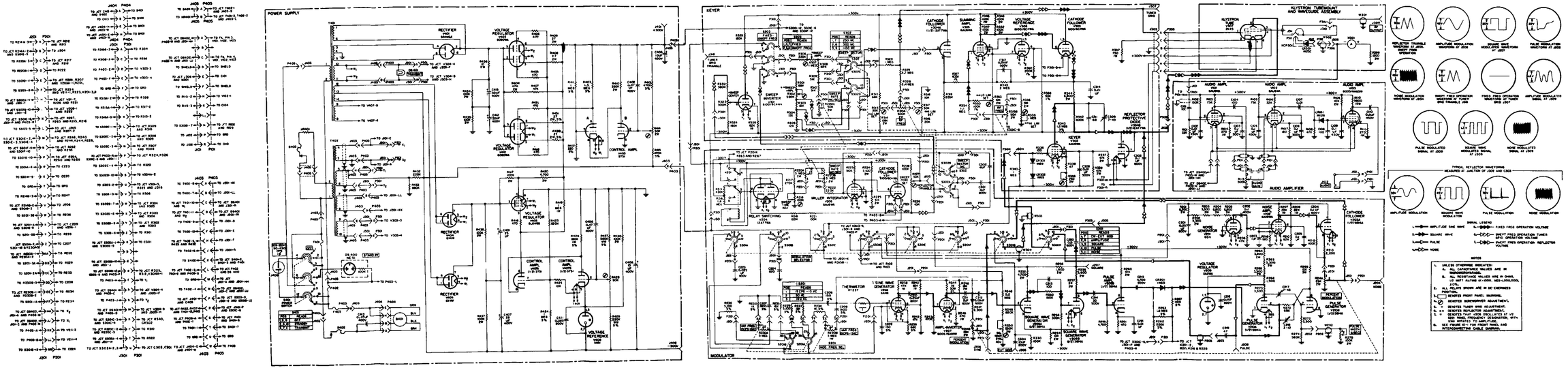


Figure10-19. Radar signal Interference Trainer (x-Band) device 15X12, Schematic diagram

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Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

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