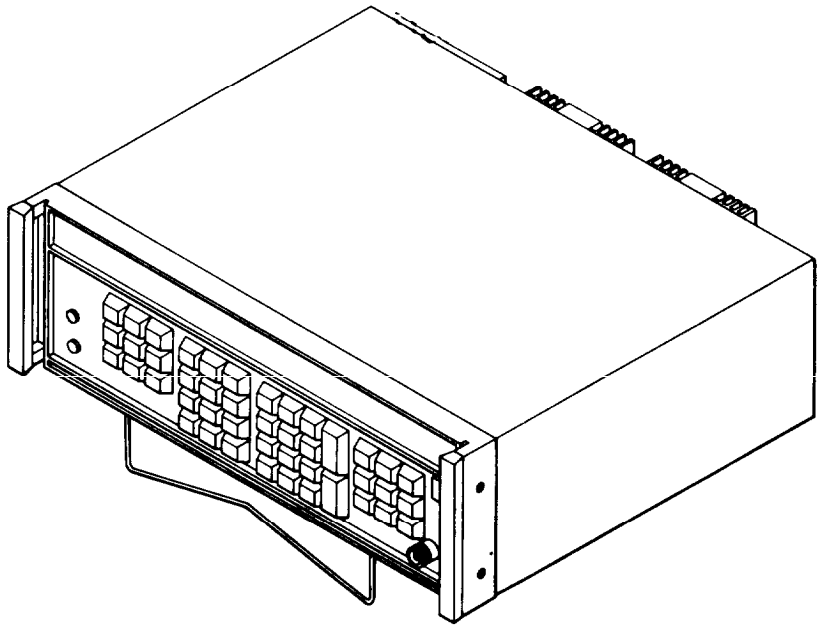
TM 11-6625-2975-12

TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL



TEST SET, RECEIVER AN/ARM-180 (NSN 6625-01-041-4161)

HEADQUARTERS, DEPARTMENT OF THE ARMY 1984

27 AUGUST 1984

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4. SEND FOR HELP AS SOON AS POSSIBLE

5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

HIGH VOLTAGE

IS USED IN THE OPERATION OF THIS EQUIPMENT

DEATH ON CONTACT

MAY RESULT IF PERSONNEL FAIL TO OBSERVE SAFETY PRECAUTIONS

Never work on electronic equipment unless there is another person nearby competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections of 115 vac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

WARNING

Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

WARNING

Dangerous potentials exist at several points throughout this equipment, which could cause severe electrical shock to personnel. When the equipment Is operated with the covers removed, do not touch exposed connections, components, or ac input connections. Some transistors have voltages present on their cases.

WARNING

Do not operate the test set If the power cable is frayed, key caps are missing or broken, or other physical damage is evident. Electrical shock to personnel could result.

WARNING

Exercise care when lifting the test set to avoid personal injury. The equipment weighs 43 pounds.

WARNING

TRICHLOROTRIFLUOROETHANE

Fumes of TRICHLOROTRIFLUORORTHANE are poisonous. Provide adequate ventilation whenever you use TRICHLOROTRIFLUOROETHANE. Do not use solvent near heat or open flame. TRICHLOROTRIFLUOROETHANE will not burn, but heat changes the gas into poisonous, irritating fumes. DO NOT breathe the fumes or vapors. TRICHLOROTRI-FLUOROETHANE dissolves natural skin oils. DO NOT get the solvent on your skin. Use gloves, sleeves and an apron which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

WARNING

Compressed air shall not be used for cleaning purposes except where reduced to less than 29 psi and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUORO-ETHANE has ben used. Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel.

TECHNICAL MANUAL

No. 11-8825-2975-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 27 August 1984

Operator's and Oranizational Maintenance Manual

TEST SET, RECEIVER AN/ARM-180 (NSN 6625-01-041-4161)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be furnished to you.

*This manual supersedes so much of TM 11-6625-2975-14&P, 30 December 1980, as pertains to operator's and organizational maintenance.

HOW TO USE THIS MANUAL

This manual is designed to help you operate as well as maintain (both at the operator and organizational level) Test Set, Receiver AN/ARM-160.

A front cover index is provided for quick reference to information contained in this manual. Each item appearing on the front cover is boxed and identified by topic, with the page number where the information is located.

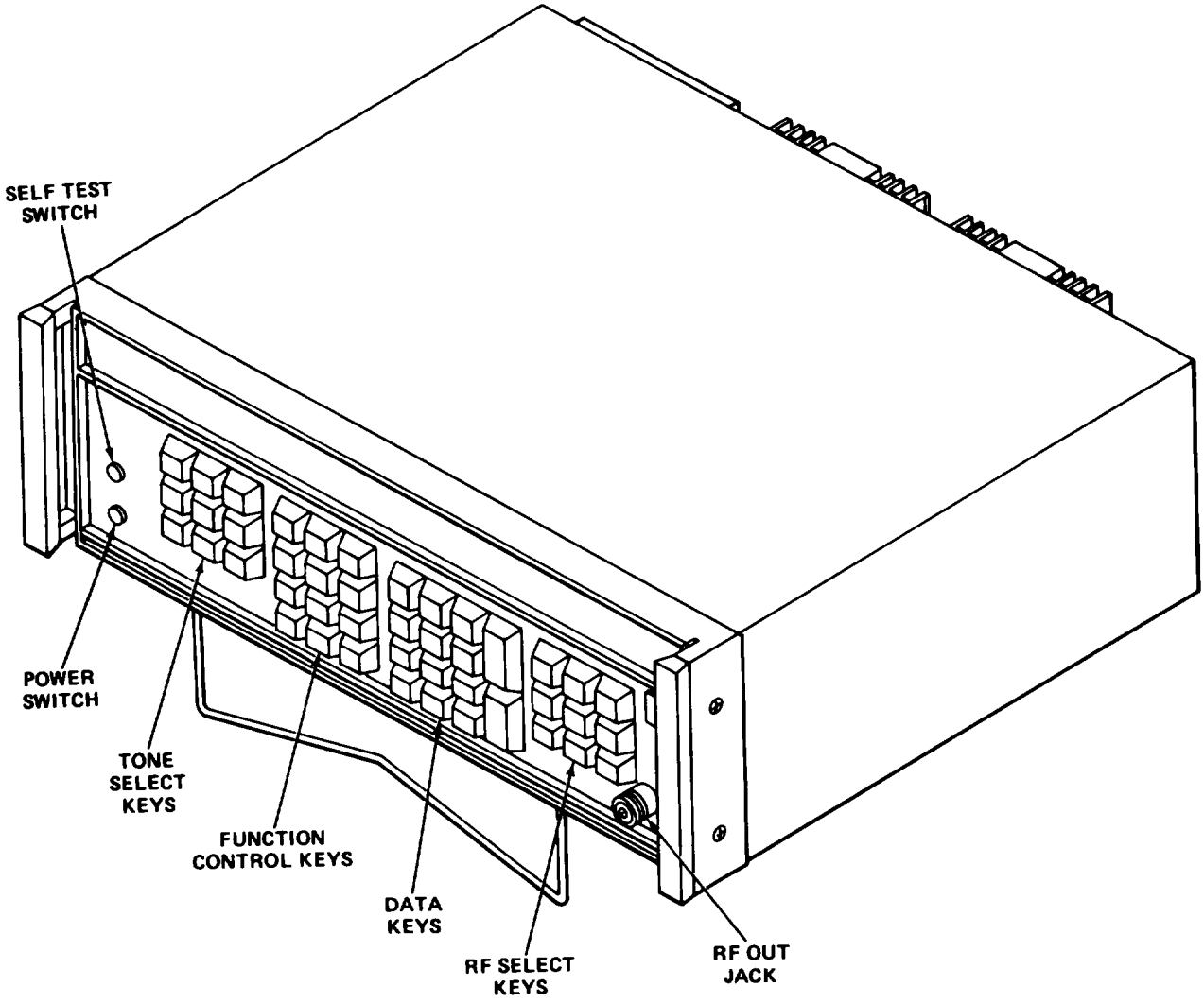
Paragraphs in this manual are numbered by chapter and order of appearance within a chapter. A subject index appears at the beginning of each section to help you find the exact paragraph you are looking for.

Measurements in this manual are given in both US standard and metric units.

There are warnings located at the beginning of this manual. Before doing maintenance on the equipment, learn the warnings and always follow safety procedures and precautions.

Step by step procedures with illustrations will give You all the necessary information needed to maintain the equipment. The steps must be followed in exact sequence. Do not attempt any short-cuts.

Instructions for performing PMCS tasks are located in paragraphs 3-5, 3-6, 3-7, and 3-8.



TEST SET, RECEIVER AN/ARM-180

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TEST SET, RECEIVER AN/ARM-180

CHAPTER 1
INTRODUCTION

OVERVIEW

This chapter supplies both general and specific information about Test Set, Receiver AN/ARM-180, and acquaints user with the equipment's purpose, basic principles of operation, and characteristics. Also furnished is information regarding proper forms used to document equipment maintenance and status, packaging and handling deficiencies, and discrepancies in shipment.

Section I GENERAL INFORMATION

1.1. SCOPE.

Type of Manual: Operator's and Organizational Maintenance.

Equipment Name and Model Number: Test Set, Receiver AN/ARM-180.

Purpose of Equipment: To generate modulated radio frequency (rf) signals for use in bench testing very high frequency omnidirectional range (VOR), Iocalizer (LOC), glidescope (GS), and marker beacon (MB) receivers.

1.2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

REPORTS OF MAINTENANCE AND UNSATISFACTORY EQUIPMENT

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

REPORT OF PACKAGING AND HANDLING DEFICIENCIES

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-1 1-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. (CONT)

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 461O.33C/AFR 75-161MC0 P461O.19D/DLAR 4500.15.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your Test Set, Receiver AN/ARM-160 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. put it on an SF 366 (Quality Deficiency Report). Mall it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be sent to you.

1-4. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS.

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-5. DESTRUCTION OF ARMY ELECTRONICS MATERIEL TO PREVENT ENEMY USE.

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-6. ADMINISTRATIVE STORAGE.

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equjpment from administrative storage, the PMCS shall be performed to ensure operational readiness. See chapter 3, section III for PMCS.

Administrative storage of equipment shall be done In accordance with TM 740-90-1, Administrative Storage of Equipment. Disassembly and repacking of equipment for shipment or limited storage are covered in chapter 3, section V.

1-7. NOMENCLATURE CROSS-REFERENCE LIST.

This list contains names used throughout this manual in place of official nomenclature.

COMMON NAME	OFFICIAL NOMENCLATURE
test set	Test Set, Receiver AN/ARM-160

1-8. SAFETY, CARE, AND HANDLING.

Observe all warnings, cautions and notes in this manual. This equipment can be extremely dangerous if these instructions are not followed. Make sure the following caution Is observed as well.

CAUTION

When operating the test set, do not restrict airflow through the blower filter.

After cleaning the blower filter, make sure it is completely dry before installing it In the blower filter cage.

Section II EQUIPMENT DESCRIPTION

1.9. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

PURPOSE OF TEST SET

A solid-state signal generator designed for bench testing VOR, localizer, glideslope, and marker beacon receivers.

FEATURES

COMP BNC, AUX BNC and DEMOD BNC connectors
50/60 Hz operation
Input power identification plate
115 or 230 vac operation

NOTE

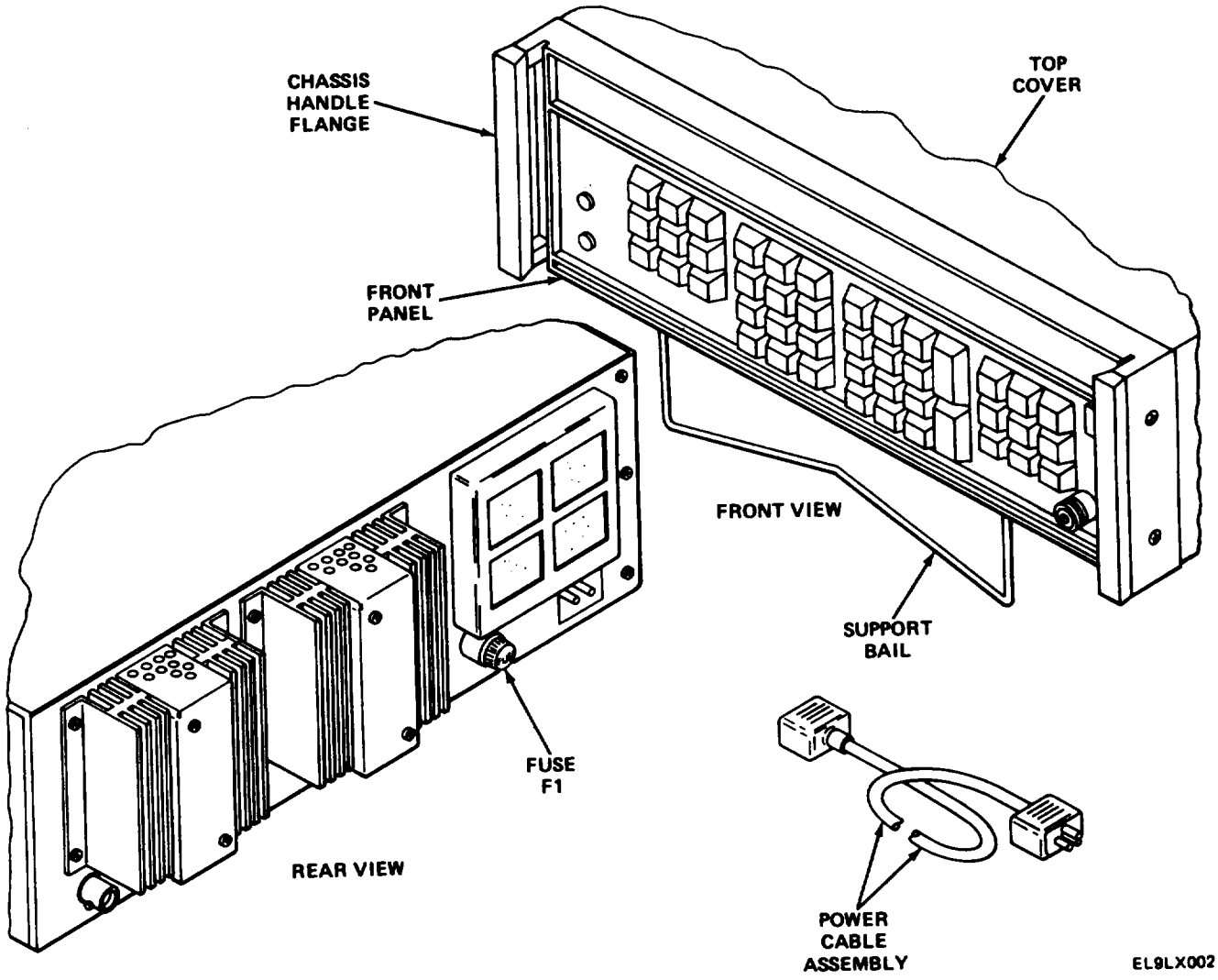
The test set is wired for 115 vac operation; however, the power transformer input wiring can be changed to permit 230 vac operation. This change is made at the next level of maintenance.

OPERATIONAL CAPABILITIES

Test set operational capabilities include:

VOR, localizer, glide slope, and marker beacon signals
Selectable VOR radials from 000.00 to 359.99 degrees
Deletion of modulation tone or tones for flag checks
1020 Hz audio tone for identification signal
Standard localizer and glide slope rf frequency pairings
Variable rf frequency to check receiver selectivity
Variable rf output level to check receiver sensitivity
Variable DDM in 0.001 increments.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.



TEST SET, RECEIVER AN/ARM-180

FRONT PANEL. All test set controls and indicators are on the front panel.

CHASSIS HANDLES. Chassis handles make carrying the test set safe and easy.

CASE. The case provides an enclosure for the test set circuits.

SUPPORT BAIL. The support ball Is used to support the test set and to orient it properly during use.

FUSE F1. Fuse F1 provides test set circuit protection.

POWER CABLE. An ac power cable is supplied with the test set.

1.11. EQUIPMENT DATA.

ELECTRICAL SPECIFICATIONS

Power Requirements	
Voltage	115/230 vat, ± 10 percent
Frequency	47 to 63 Hz
Power	300 v a, maximum
Fuse	4amp, 120v for 115v; 2 amp, 250v for 230v
Warmup Time	None (30 minutes before specified performance tests only)
Rf Outputs	
Frequencies	
VOR/LOC	108.00 to 117.95 MHz, selectable in 50 kHz steps
Glideslope (GS)	329.15 to 335.00 MHz, selectable In 150 kHz steps
Marker beacon	75.0 MHz, fixed, 74.6 to 75.4 MHz, selectable in 25 kHz steps
Frequency vernier	Varies selected output frequency ± 0.025 percent
Frequency resolution	Fixed, 1 kHz; vernier, 100 Hz
Frequency accuracy	± 2 ppm, (+50° to + 104 °F(+10°to +40°C)) including aging
Output level	
Range	
db mW	-6 to -120 db mW, variable in 1 db increments
Voltage	112 mV to 0.22 uV, variable in 1 db increments
Accuracy	
-6 to -60 db mW	± 1.5db
-60 to -120 db mW	± 2.0 db
VSWR	1.5:1
External attenuation	Not required. Microvolt output is “hard mlcro-volts” and eliminates 6 db external attenuation requirements
Spectral purity	
Harmonics	
VOR/LOC or marker beacon	30 db be low carrier
Glideslope	25 db be low carrier
Spurious signals (excluding frequencies within ± 15 kHz of carrier)	80 db be low carrier

NOTE

Broadband noise is specified in units of "dbc/Hz." The unit dbc/Hz is equivalent to db below carrier level measured in a 1 Hz noise bandwidth.

Broadband noise (SSB)	
74.60 to 75.40 MHz (marker beacon)	115 dbc/Hz 40 kHz from carrier
108.00 to 117.95 MHz (VOR/LOC)	122 dbc/Hz 40 kHz from carrier
329.15 to 335.00 MHz (glideslope)	115 dbc/Hz 120 kHz from carrier

1.11. EQUIPMENT DATA. (CONT)

ELECTRICAL SPECIFICATIONS (CONT)

VOR Mode	
Modulation Tones	
Frequencies	30 Hz reference, 30 Hz variable, 9960 Hz, and 1020 Hz (ident)
Frequency accuracy	± 0.005 percent
Radial range	000.00 to 359.99 degrees (selectable in O.01-degree increments, variable in preset steps of +30 degrees, ± 10 degrees and ± 0.01 degree)
Radial accuracy	± 0.01 degree of selected radial
Amplitude Modulation	± 30 percent
Localizer and Glidescope Modes	
Modulation Tones	
Frequencies	
Localizer	90,150 and 1020 Hz
Glidescope	90 and 150 Hz
Frequency Accuracy	± 0.005 percent
Marker Beacon	
Modulation tones	
Frequencies	
Outer marker	400 Hz
Middle marker	1300 Hz
Inner marker	3000 Hz
Frequency accuracy	± 0.005 percent

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	+50°to + 104°F; + I00 to +40°C
Storage	-4° to + 185 °F; -20°to +85°C
Humidity	95 percent, relative

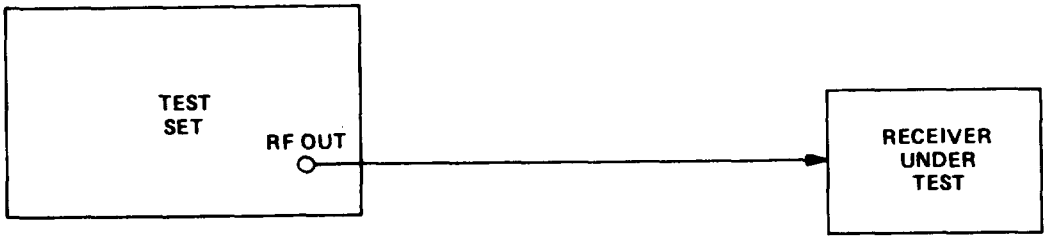
PHYSICAL AND MECHANICAL SPECIFICATIONS

Weight	43 lb (19.5 kg)
Dimensions	
Width	17.0 in. (432 mm)
Height	7.0 in. (178 mm)
Length	20.0 in. (508 mm)
Connectors	
Front panel (RF OUT)	Type N, female
Rear panel (AUX, DEMOD, COMP)	Type BNC, female
Cooling requirements	Internal blower

Section III TECHNICAL PRINCIPLES OF OPERATION

1-12. GENERAL.

The test set is a microprocessor-controlled signal generator that produces audio-modulated rf signals. Modulated rf signals simulate VOR, localizer, glideslope, and marker beacon ground station signals. Simulated ground station signals are used to test and troubleshoot VOR, localizer, glideslope, and marker beacon receivers. Front panel mounted keys allow an operator to select ground signal to be simulated. Selection of desired rf (carrier) frequency places signal generator in correct mode of operation and preset condition for mode of operation.



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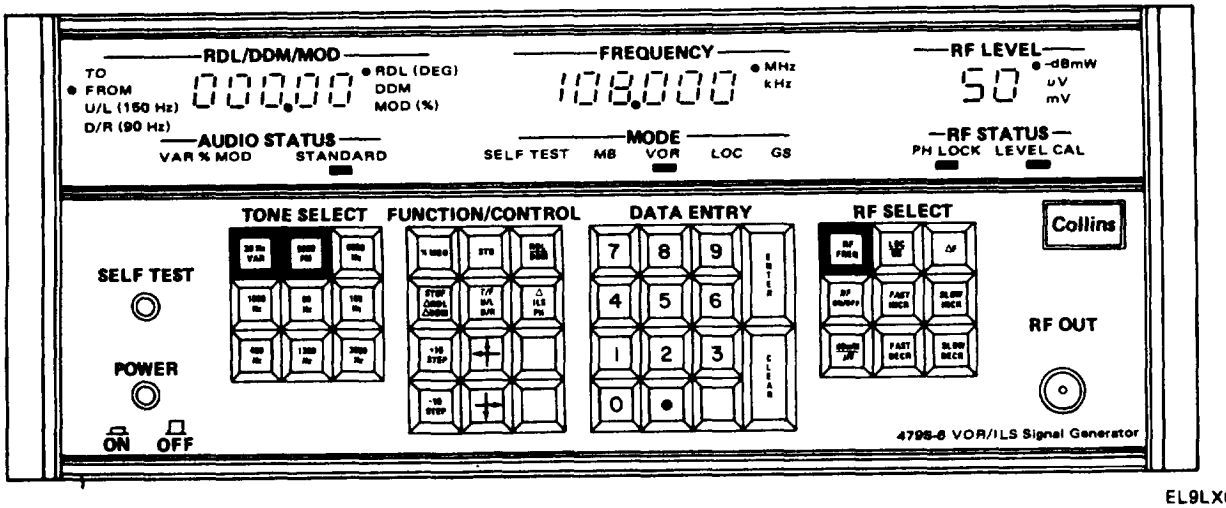
VOR, localizer, glideslope, or marker beacon receivers under test are connected to RF OUT connector on test set front panel. Simulated ground station signal produced by test set is applied through RF OUT connector to receiver under test.



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1-13. TEST SET OPERATION.

INITIAL POWER-ON/MEMORY CHECK

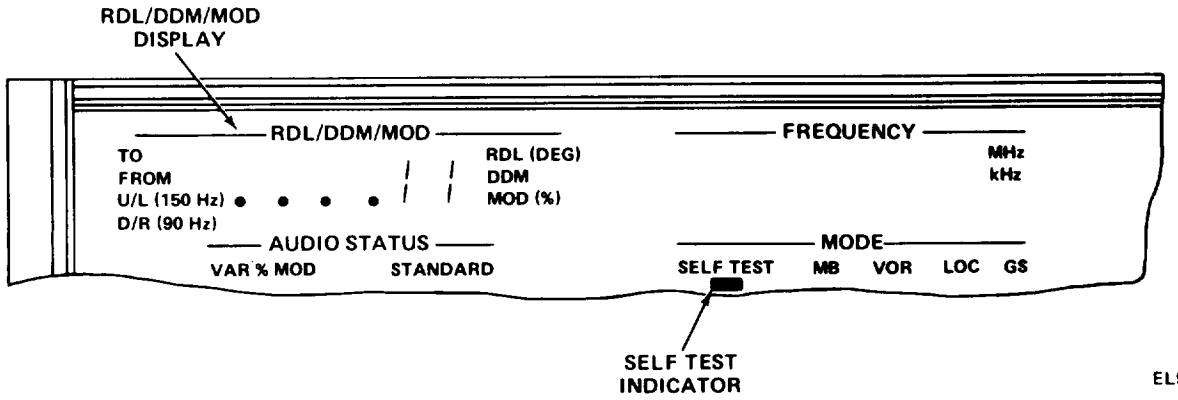
During initial power on, test set automatically checks Its memory for any incorrect outputs. Displays, keys, and indicators will go dark for a short time until check Is complete, Results of the check areas follows:

1-13. TEST SET OPERATION. (CONT)

NOTE

Illustrations show lit keys in heavy outline, and lit indicators are filled in or blackened. This method is used throughout the manual.

Memory Check Fails



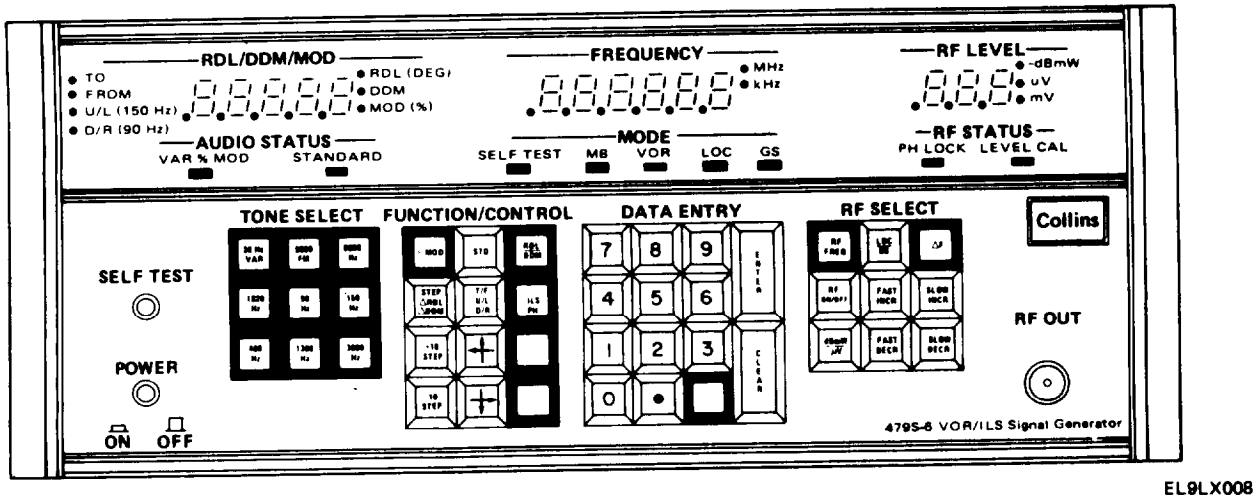
RDL/DDM/MOD display indicates the number of the bad memory chip and SELF TEST indicator lights as shown above. After a short time, RDL/DDM/MOD display and SELF TEST indicator will flash on and off to alert operator that a memory output is incorrect. Refer equipment to higher level of maintenance if this happens.

Memory Check Passes

Test set automatically switches to VOR mode preset condition. Test set is now ready for use.

SELF-TEST OPERATION

Self-test operation consists of two parts: lamp check and memory check. When SELF TEST switch is pressed and held, lamp check is performed. When SELF TEST switch is released, memory check is performed.



1-13. TEST SET OPERATION. (CONT)

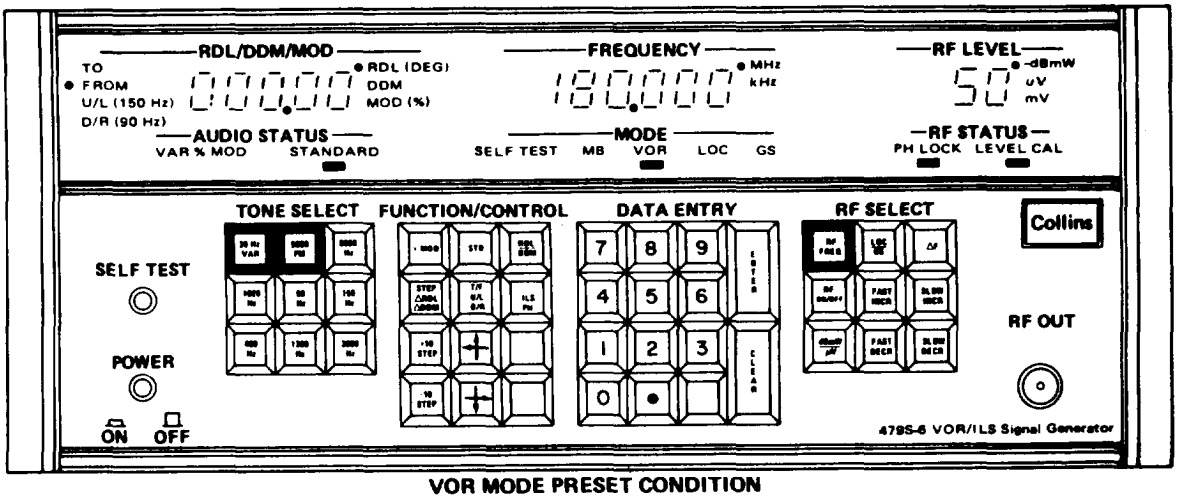
Lamp check provides the operator with a check of lamps located behind switch actuating lens, various indicators, and all segments of each seven-segment LED that make up displays.

During lamp check, all lamps, displays, and indicators will light as shown.

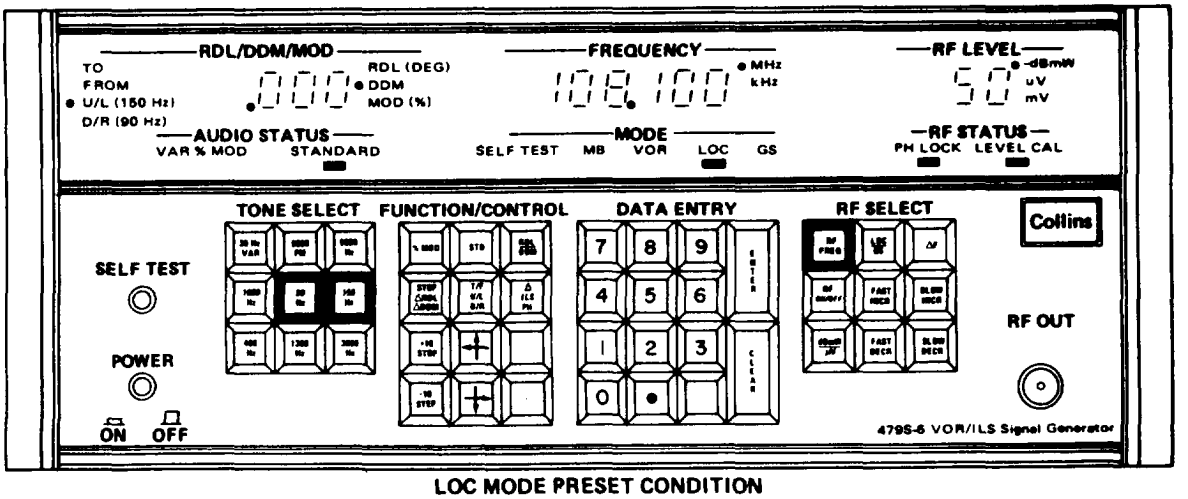
Memory check tells the operator if any memory outputs are incorrect. When SELF TEST switch is released, RDL/DDM/MOD display begins counting from . . . . 01. If a memory output is incorrect, the count will stop and the number of the memory chip with incorrect output is shown in RDL/DDM/MOD display. SELF TEST indicator LED also lights. The number of the memory chip and SELF TEST indicator flash on and off indicating malfunction-. If all memory outputs are correct, the count will reach . . . . 14 and test set will switch to VOR mode preset condition.

PRESET CONDITIONS

For each selected mode of operation (VOR, localizer, glideslope, or marker beacon), test set automatically sets signal generator parameters. Test set displays, keys, and indicators will light



VOR MODE PRESET CONDITION



LOC MODE PRESET CONDITION

NOTE:

SHADED KEYS INDICATE LIT KEYS

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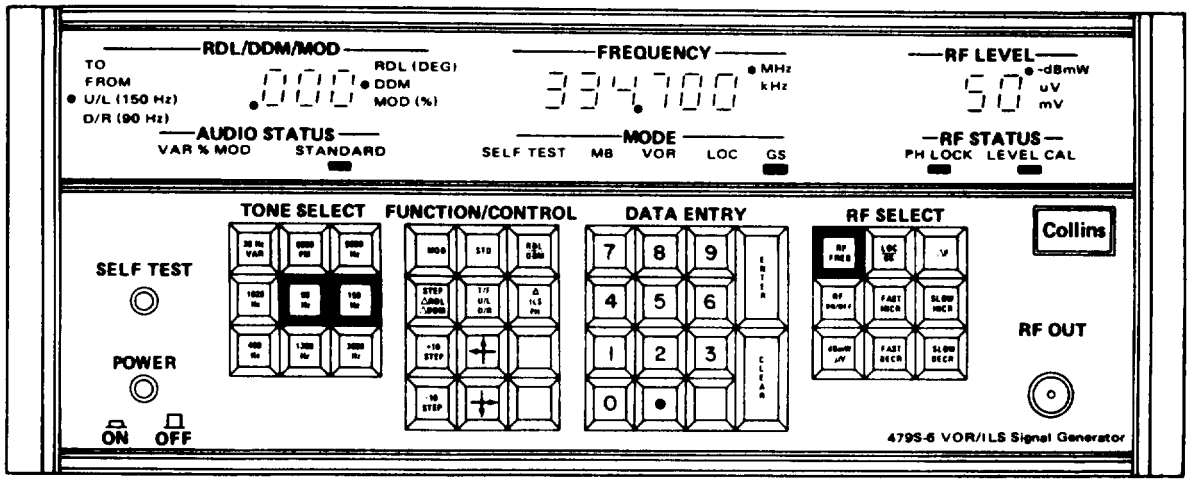
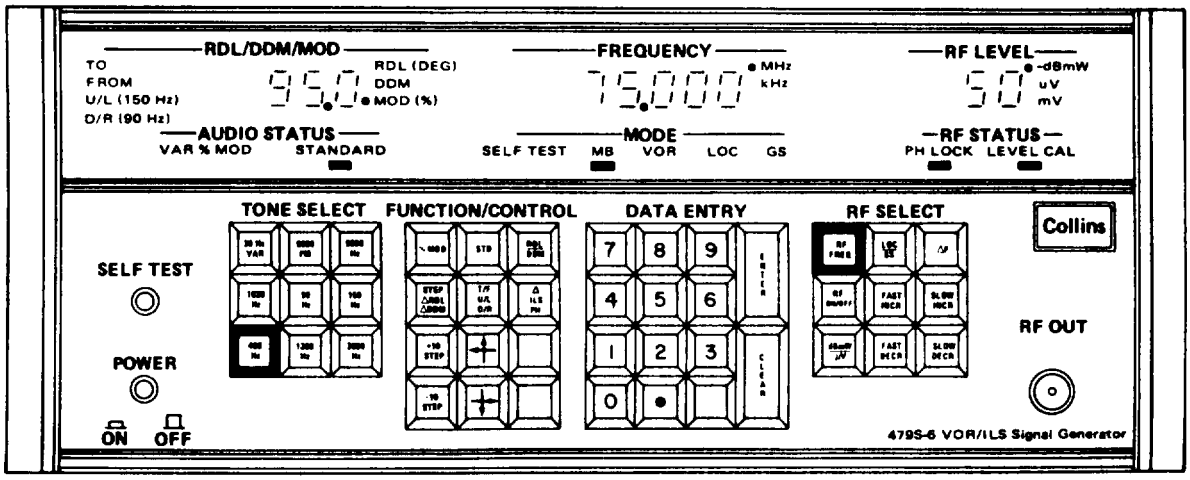
1-13. TEST SET OPERATION. (CONT)



GS MODE PRESET CONDITION



MARKER BEACON MODE PRESET CONDITION

NOTE:
SHADED KEYS INDICATE LIT KEYS

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VOR MODE OPERATION

When a standard VOR rf carrier frequency is selected (see table 2-11), test set automatically switches to VOR mode preset condition. Rf output signal from test set simulates a VOR ground station signal with the following parameters:

1-13. TEST SET OPERATION. (CONT)

SIGNAL CHARACTERISTIC	OUTPUT PARAMETER
VOR rf carrier frequency	Selected standard VOR ground station frequency.
Rf carrier modulation	30 Hz variable AM/9960 Hz FM (30 Hz reference) composite audio signal.
Amplitude (%) modulation	30.0 percent.
VOR radial	000.00 degree.
TO or FROM status indicator	FROM.
Output level	-50 db mW. (If the output level is changed after initial power on or after self-test, the level remains at the selected level.)

The rf carrier frequency is variable to greater than ±0.025 percent of selected frequency to check receiver selectivity. The carrier frequency can be varied in either direction at a fast or slow rate depending on test requirements.

The rf output level is adjustable from -6 to -120 db mW to allow operator selection of output level required to meet test requirements for receiver response. The output level can be increased or decreased in either 1 or 10 db steps as required by the operator.

Amplitude (%) modulation of simulated VOR signal is adjustable from 10.0 to 35.0 percent in O.1-percent increments to check receiver response.

TO/FROM indication is determined by phase relationship of composite audio VOR signal and is always a FROM signal on initial selection of VOR mode. Through keyboard entry, the FROM signal can be changed to a TO signal, which phase shifts VOR bearing signal by 160 degrees.

A 1020 Hz audio tone to test the receiver audio circuits can be added to VOR rf output signal at 30-percent modulation by keyboard entry. Individual control of identification signal allows operator to add or remove the signal as required during receiver checks.

Either or both of the 30 Hz variable or 9960 Hz FM signals can be removed as required to perform receiver flag checks.

1-13. TEST SET OPERATION. (CONT)

Any time information displayed in RDL/DDM/MOD and AUDIO STATUS displays is changed from preset condition or rf carrier frequency is slewed (increased or decreased) from selected rf carrier frequency, and it is desired to return test set to a preset condition, a single entry using STD key returns test set to preset condition for selected rf carrier frequency. The rf output level is not affected by STD key and remains at last selected output level.

LOCALIZER MODE OPERATION

When a standard localizer rf carrier frequency is selected (see table 2-11), test set automatically switches to LOC mode preset condition. The rf output signal from test set simulates a localizer ground station signal with the following parameters:

SIGNAL CHARACTERISTIC	OUTPUT PARAMETER
Localizer rf carrier frequency	Selected standard localizer ground station frequency.
Rf carrier modulation	90 Hz/150 Hz AM composite audio signal.
Amplitude (%) modulation	20.0 percent per tone, on beam center.
DDM	0.000.
U/L (150 Hz) or D/R (90 Hz) status indicators	U/L (150 Hz).

A 1020 Hz audio tone can be added to localizer rf output signal at 30-percent modulation by keyboard entry. Individual control of identification signal allows operator to add or remove the signal to test the receiver audio circuits.

The difference in depth of modulation (DDM) is selectable in standard preset DDM steps of 0.000, ± 0.046, ±0.093 ± 0.155, and ±0.200, or in 0.001 increments to ±0.400 through keyboard entry. DDM can be slewed in either direction in ± 0.001 increments. DDM adjustments are used to check receiver operation and accuracy. Amplitude (%) modulation in the LOC mode is variable from 5.0 to 40.0 percent in 0.1 percent increments to check receiver response. Amplitude (%) modulation can only be varied at beam center.

When test set produces an up or left signal, the 150 Hz portion of the composite signal is predominant and when test set produces a down or right signal, the 90 Hz portion of the composite signal is predominant. All DDM signals produced by the test set are up or left signals unless changed to a down or right signal through keyboard entry. The 90 and 150 Hz signals are balanced at 0.000 DDM and neither signal is predominant, however, test set provides a U/L (150 Hz) indication which indicates the next DDM step will be in the up or left direction. The DDM cannot be changed to indicate D/R (90 Hz) at 0.000 DDM.

Either or both of the 90 and 150 Hz audio signals can be removed as required to perform receiver flag checks.

1-13. TEST SET OPERATION. (CONT)

Test set can be returned to preset condition using STD key the same as described for VOR mode.

GLIDESLOPE (GS) MODE OPERATION

When a standard glideslope (GS) rf carrier frequency is selected (see table 2-11), test set automatically switches to GS mode preset condition. The rf output signal from test set simulates a glideslope ground station signal with the following parameters:

SIGNAL CHARACTERISTIC	OUTPUT PARAMETER
Glideslope rf carrier frequency	Selected standard glideslope ground station frequency.
Rf carrier modulation	90 Hz/150 Hz AM composite audio signal.
Amplitude (o/o) modulation	40.0 percent per tone, on beam center.
DDM	0.000.
U/L (150 Hz) or D/R (90 Hz) status indicator	U/L (150 Hz).

Operation in glideslope mode is the same as in localizer mode except DDM is selectable in standard preset steps of 0.000, ± 0.045, ± 0.091, ± 0.175, and ± 0.400, or in 0.001 increments to ±0.800 through keyboard entry. DDM can be slewed in either direction in 0.002 increments. Percent modulation is variable from 10.0 to 80.0 percent. The 1020 Hz audio signal cannot be added to the glideslope signal.

MARKER BEACON (MB) MODE OPERATION

When the standard marker beacon rf carrier frequency (75.000 MHz) is selected, test set automatically switches to MB mode preset condition. The rf output signal from test set simulates a marker beacon ground station signal with the following parameters:

SIGNAL CHARACTERISTIC	**OUTPUT PARAMETER**
Marker beacon rf carrier frequency	**75.000 MHz.**
Rf carrier modulation signal	**400 Hz AM audio signal.**
Amplitude (%) modulation	**95.0 percent.**

1-13. TEST SET OPERATION. (CONT)

The test set provides 400 Hz (outer marker), 1300 Hz (middle marker), and 3000 Hz (inner marker) audio modulation tones. Audio tones are selectable as required for testing, troubleshooting, and alining a marker beacon receiver. Any tone may be removed if required.

The amplitude (%) modulation is variable from 90.0 to 97.0 percent in 0.1-percent increments for testing receiver response.

The test set is capable of producing rf frequencies from 74.6 to 75.4 MHz to provide simulation of interference-type signals.

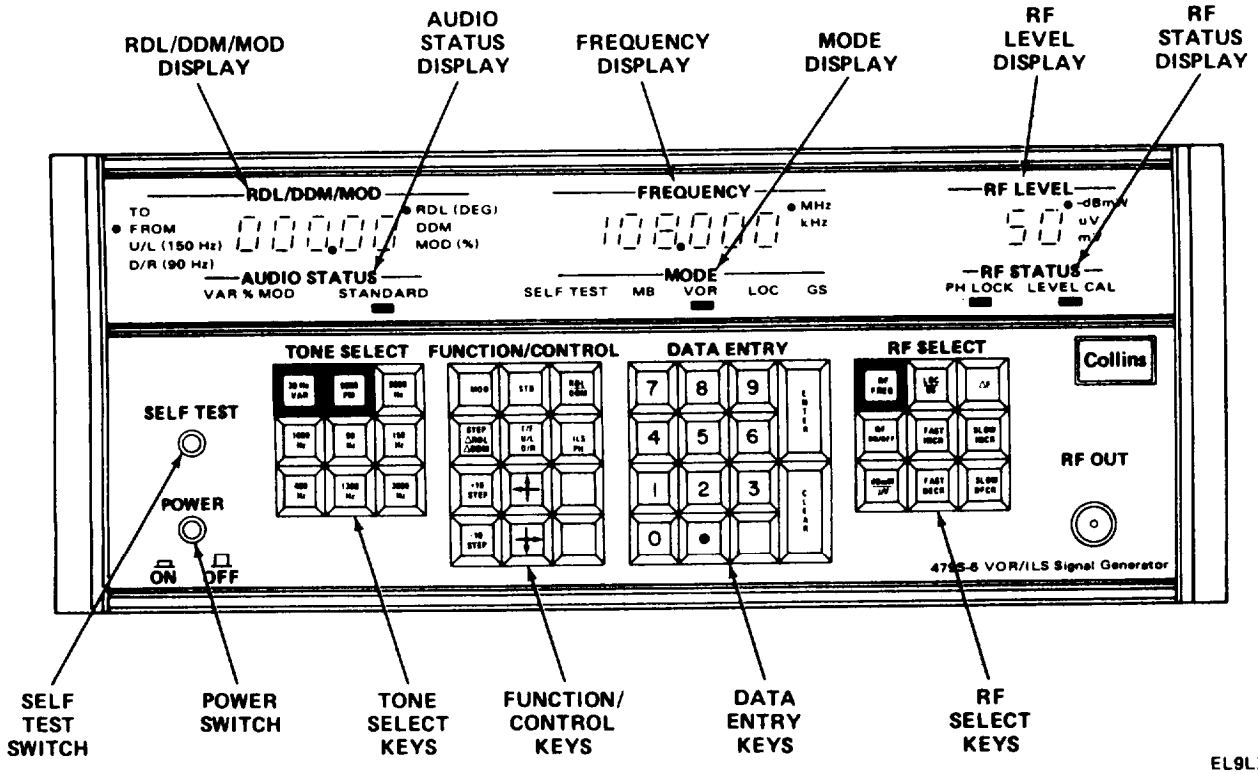
CHAPTER 2

OPERATING INSTRUCTIONS

Section I DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2.1. GENERAL.

The keyboard and indicators on the front panel are grouped according to the functions they perform.



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There are four keyboard groups: TONE SELECT, FUNCTION/CONTROL, DATA ENTRY, and RF SELECT. The keyboard is used to select test set functions and set test set output parameters.

Note that a number of keys have light bulbs behind switch actuating lenses and will light when pressed, or during normal operation.

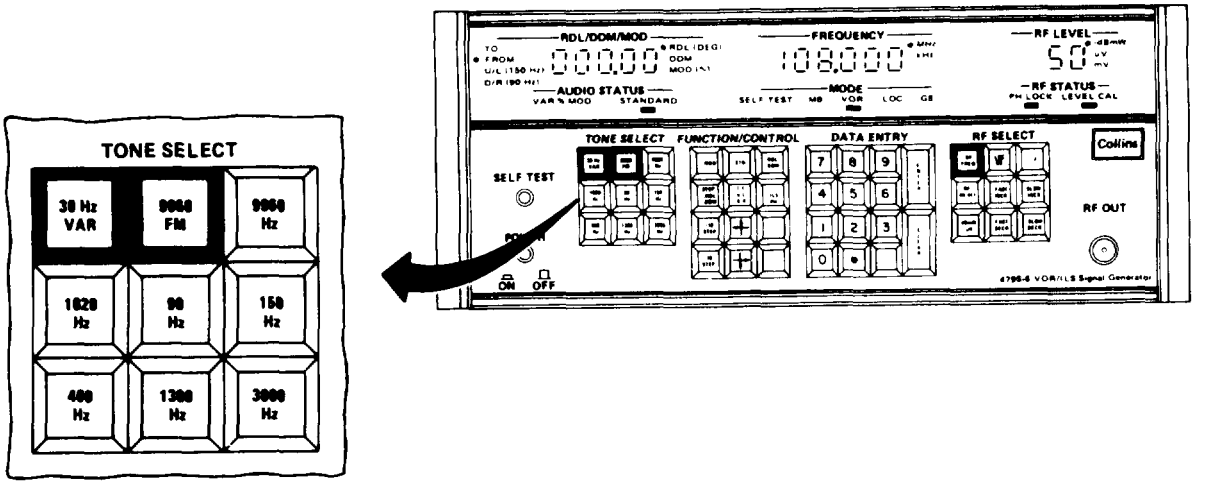
2.1. GENERAL. (CONT)

There are three groups of seven-segment displays, RDL/DDM/MOD, FREQUENCY, and RF LEVEL, as well as a number of LED indicators. Displays and indicators provide a readout of test set output parameters and characteristics.

A POWER switch and a SELF TEST switch, both pushbutton types, are also located on the front panel. POWER switch is used to turn test set on and off. SELF TEST switch initiates lamp test and program check functions.

2-2. CONTROLS AND INDICATORS.

TONE SELECT KEYS



EL9LX010

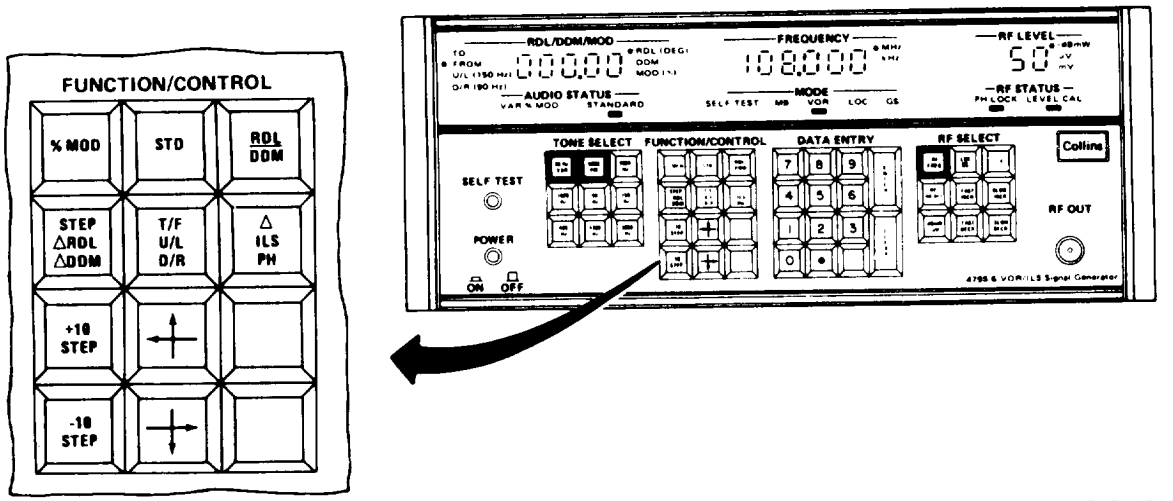
Audio tones required for testing are selected by TONE SELECT keys. Table 2-1 shows individual tone select key functions.

TABLE 2-1. TONE SELECT KEY FUNCTIONS

KEY	FUNCTION
30 Hz VAR	Selects 30 Hz variable VOR signal.
9960 FM	Selects 9960 Hz FM (30 Hz reference) VOR signal.
9960 Hz	Selects 9960 Hz only signal.
1020 Hz	Selects 1020 Hz audio tone (ident) signal.
90 Hz	Selects 90 Hz ILS signal.
150 Hz	Selects 150 Hz ILS signal.
400 Hz	Selects 400 Hz (outer marker) marker beacon signal.
1300 Hz	Selects 1300 Hz (middle marker) marker beacon signal.
3000 Hz	Selects 3000 Hz (inner marker) marker beacon signal.

2-2. CONTROLS AND INDICATORS. (CONT)

FUNCTION/CONTROL KEYS



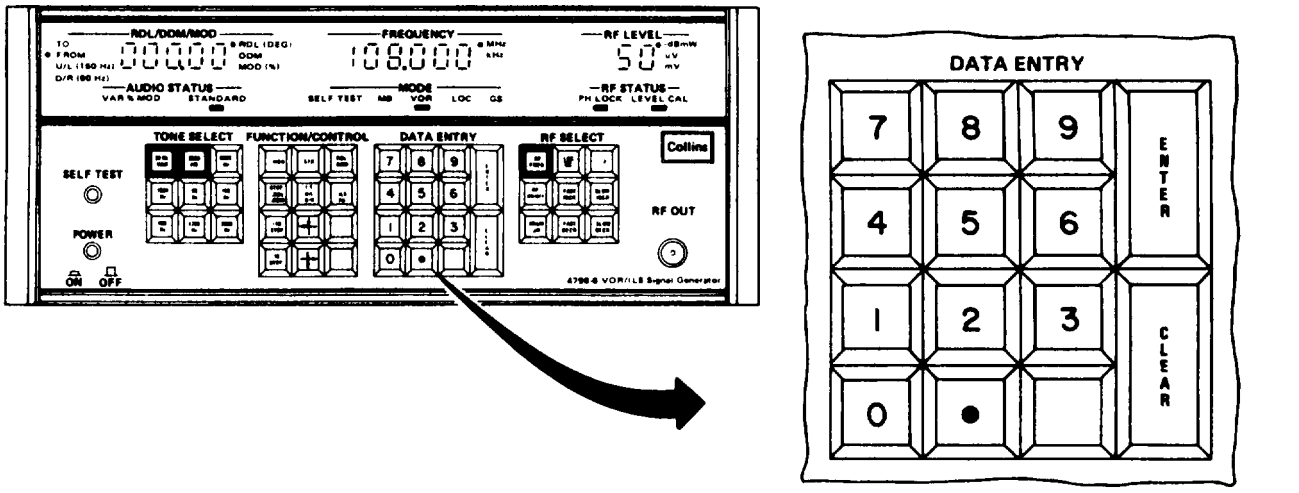
EL9LX011

FUNCTION/CONTROL keys control information displayed in RDL/DDM/MOD and AUDIO STATUS displays. Table 2-2 shows individual function/control key functions.

TABLE 2-2. FUNCTION/CONTROL KEY FUNCTIONS

KEY	FUNCTION
% MOD	Allows selection of percent modulation through DATA ENTRY keys and switches RDL/DDM/MOD display to indicate percent modulation.
STD	Switches RDL/DDM/MOD and AUDIO STATUS displays back to the preset condition for the selected mode.
RDL/DDM	Enables selection of radial in VOR mode or DDM in ILS mode through DATA ENTRY keys.
STEP Δ RDL Δ DDM	Steps VOR radial in + 30-degree steps or ILS DDM in standard DDM steps.
T/F U/L D/R	Selects either a FROM or TO radial in VOR mode, or a 90 Hz predominant or 150 Hz predominant signal in ILS mode.
Δ ILS PH	When enabled, a phase shift equivalent to 60 degrees of the 150 Hz component is introduced, as measured between positive-going zero crossings of the 90 Hz and 150 Hz components of the ILS composite waveform.
+ 10 STEP	Steps VOR mode radial in + 10-degree steps.
+	Slews VOR mode radial in + 0.01-degree steps, LOC mode DDM in 0.001 (left) steps, or GS mode DDM in 0.002 (up) steps.
-10 STEP	Steps VOR mode radial in -10-degree steps.
-	Slews VOR mode radial in -0.01-degree steps, LOC mode DDM in 0.001 (right) steps, or GS mode DDM in 0.002 (down) steps.

2-2 CONTROLS AND INDICATORS. (CONT)



EL9LX012

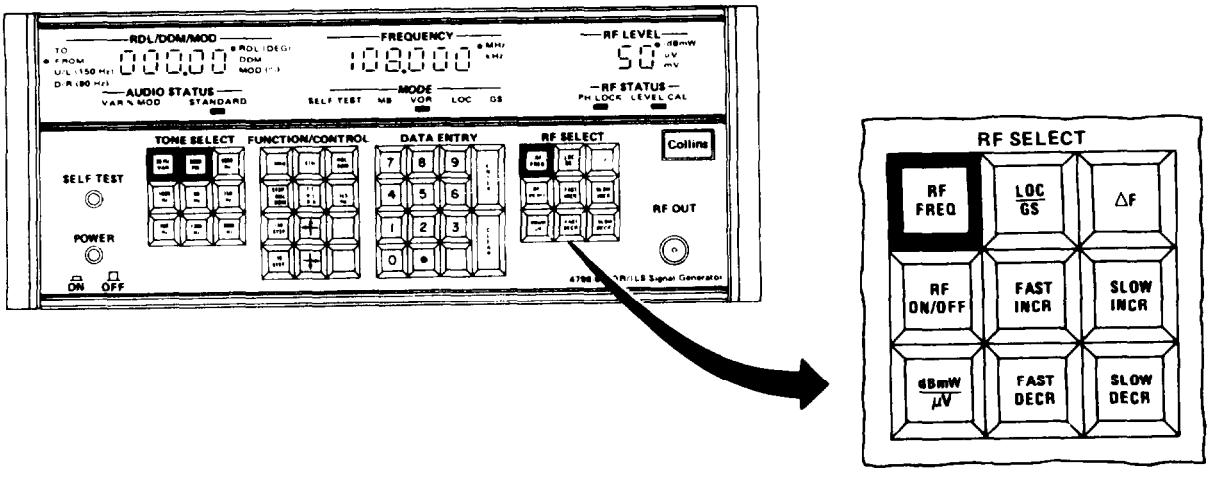
DATA ENTRY keys enter rf carrier frequencies, radials, DDM, and modulation percentages. Table 2-3 shows individual data entry key function.

TABLE 2-3. DATA ENTRY KEY FUNCTIONS

KEY	FUNCTION
Numerical O through 9	Provides numerical entry of rf carrier frequency, VOR radials, ILS DDM, and percent modulation when correct modifier key is pressed and lit.
● (decimal)	Used for numerical entries requiring a decimal point.
ENTER	Enables numerical entries to signal generator circuits.
CLEAR	Clears numerical key entry before ENTER key is pressed and also clears nonvalid entries.

2-2. CONTROLS AND INDICATORS. (CONT)

RF SELECT KEYS



EL9LX013

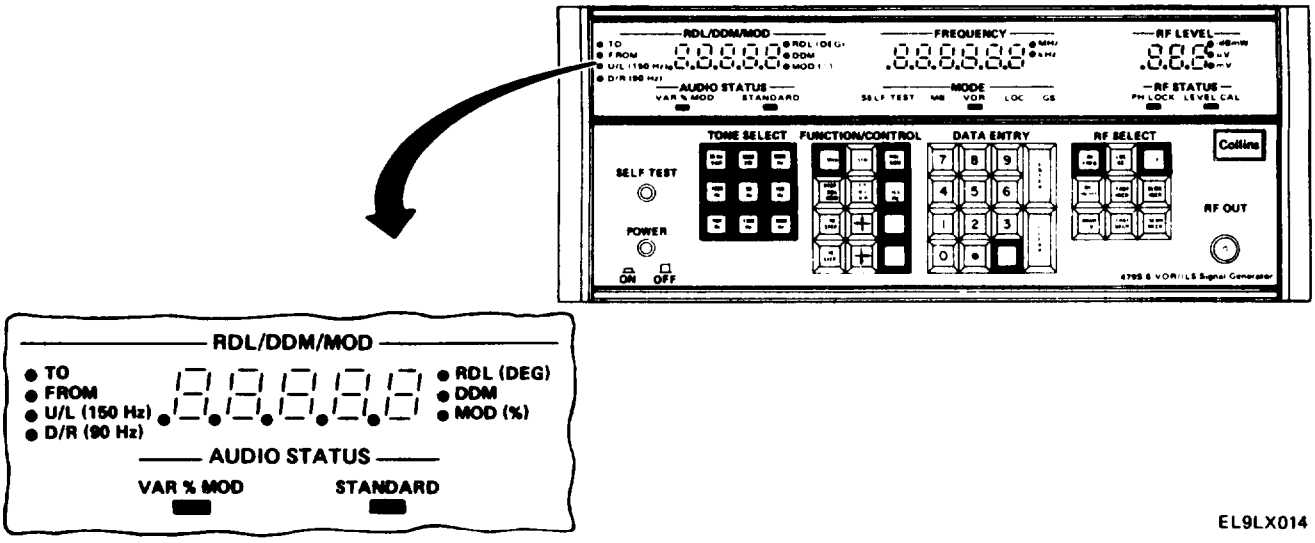
RF SELECT keys are used for rf frequency selection and control of rf output level. Table 2-4 shows individual rf select key functions.

TABLE 2-4. RF SELECT KEY FUNCTIONS

KEY	FUNCTION
RF FREQ	Enables selection of rf carrier frequencies through DATA ENTRY keys.
LOC/GS	Switches rf carrier frequency from selected localizer frequency to paired glide slope frequency or vice versa.
Δ F	Enables rf carrier frequency slewing through FAST INCR, SLOW INCR, FAST DECR, and SLOW DECR keys.
RF ON/OFF	Switches output of RF OUT connector alternately from ON to OFF.
FAST INCR	Increases rf output level in 10 db steps or, when A F key is enabled (lit), increases rf carrier frequency at a fast rate.
SLOW INCR	Increases rf output level in 1 db steps or, when A F key is enabled (lit), increases rf carrier frequency at a slow rate.
FAST DECR	Decreases rf output level in 10 db steps, or when A F key is enabled (lit), decreases rf carrier frequency at a fast rate.
SLOW DECR	Decreases rf output level in 1 db steps or, when A F key is enabled (lit), decreases rf carrier frequency at a slow rate.

2-2. CONTROLS AND INDICATORS. (CONT)

RDL/DDM/MOD DISPLAY



RDL/DDM/MOD display provides readout of selected radials (RDL) from 000.00 to 359.99 degrees (DEG), readout of difference in depth of modulation (DDM) in 0.001 increments, and readout of percent modulation (MOD). In addition to the five-digit, seven-segment display, there area number of indicators associated with the display. Their function is to indicate the type of information being displayed. Table 2-5 shows individual indicator functions.

TABLE 2-5. RDL/DDM/MOD LED INDICATOR FUNCTIONS

INDICATOR	FUNCTION
TO	indicates that a TO radial has been selected.
FROM	Indicates that a FROM radial has been selected.
U/L (150 Hz)	Indicates that the next DDM step will be in the up or left direction. (LOC or GS modes only.)
D/R (90 Hz)	Indicates that the next DDM step will be in the down or right direction. (LOC or GS modes only.)
RDL (DEG)	Indicates that a VOR radial has been selected.
DDM	Indicates ILS difference in depth modulation selection and adjustment.
MOD (%)	Indicates selection of percent modulation function.

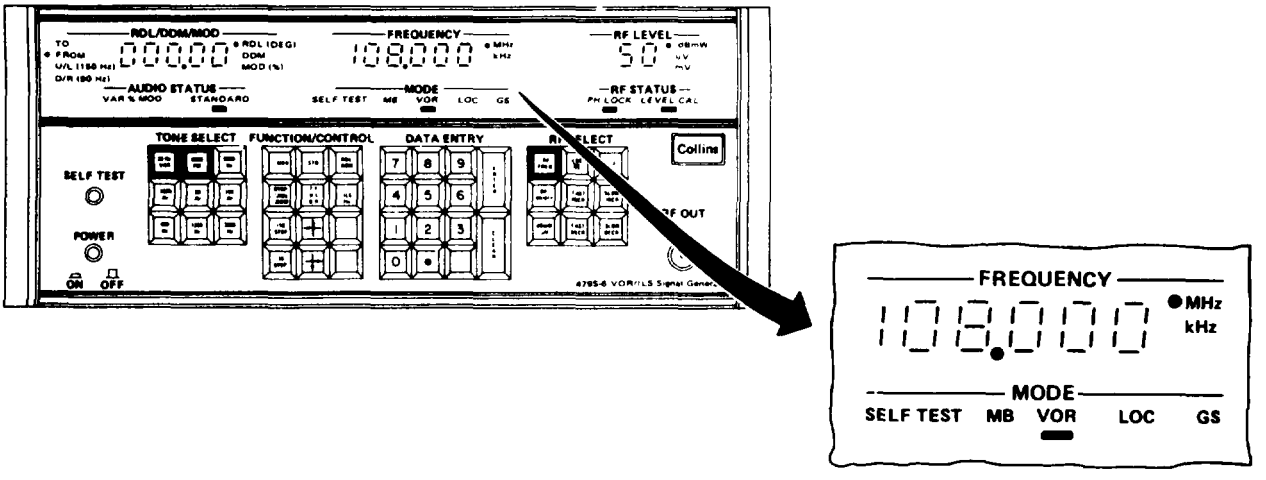
Associated with RDl/DDM/MOD display is AUDIO STATUS display. AUDIO STATUS consists of two indicators. Table 2-6 shows individual indicator functions.

2.2. CONTROLS AND INDICATORS. (CONT)

TABLE 2-6. AUDIO STATUS DISPLAY LED INDICATORS

INDICATOR	FUNCTION
VAR % MOD	Indicates DATA ENTRY keys are ready to receive percent modulation selections.
STANDARD	Indicates that a standard VOR, ILS, or MB frequency has been selected and the test set is in the preset condition.

FREQUENCY DISPLAY



EL9LX015

FREQUENCY display provides a readout of selected rf carrier frequency and any change in frequency. In addition to the six-digit, seven-segment display, there are two indicators associated with the frequency display. Table 2-7 shows individual indicator functions.

TABLE 2-7. FREQUENCY INDICATOR FUNCTIONS

INDICATOR	FUNCTION
MHz	Indicates frequency reading in megahertz.
kHz	Indicates frequency reading in kilohertz.

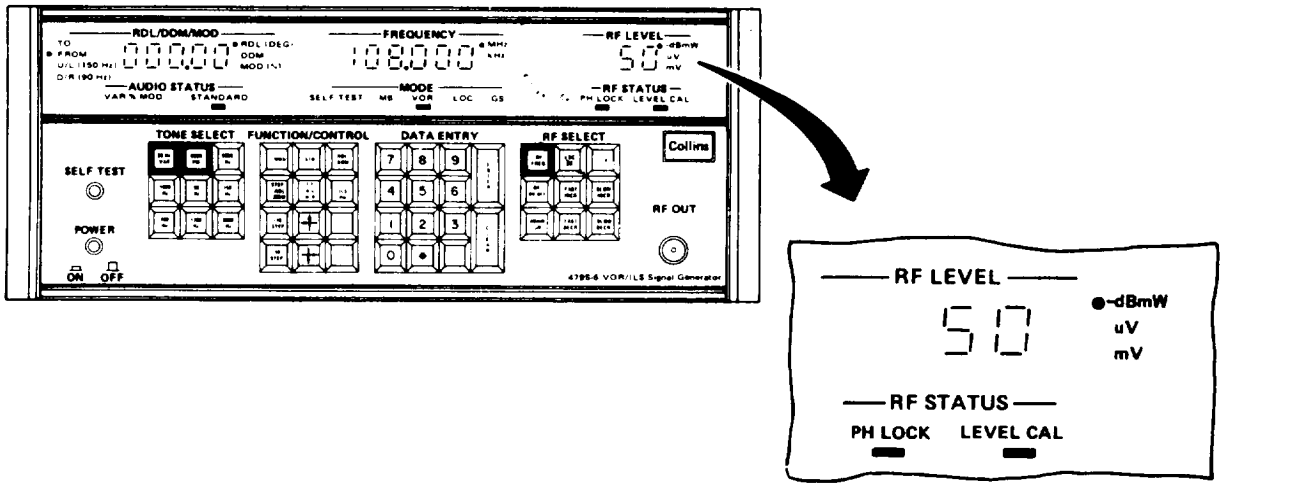
2-2. CONTROLS AND INDICATORS. (CONT)

Associated with FREQUENCY display is MODE display, which consists of five indicators. Table 2-8 shows individual indicator functions.

TABLE 2-8. MODE DISPLAY INDICATORS

INDICATOR	FUNCTION
SELF TEST	Indicates self-test mode has been selected.
MB	Indicates selection of marker beacon mode of operation.
VOR	Indicates selection of VOR mode of operation.
LOC	Indicates selection of localizer mode of operation.
GS	Indicates selection of glide slope mode of operation.

RF LEVEL DISPLAY



EL9LX016

RF LEVEL display provides a readout of rf output signal level in decibels, microvolt, or millivolts. In addition to the three-digit, seven-segment display, there are three indicators associated with the display. Table 2-9 shows individual indicator functions.

TABLE 2-9. RF LEVEL LED INDICATOR FUNCTIONS

INDICATOR	FUNCTION
-dB mW	Rf output reading in decibels.
µV	Rf output reading in microvolt.
mV	Rf output reading in millivolts.

2-2. CONTROLS AND INDICATORS. (CONT)

Associated with RF LEVEL display is RF STATUS display, consisting of two indicators. Table 2-10 shows individual indicator functions.

TABLE 2-10. RF LEVEL INDICATOR FUNCTIONS

INDICATOR	FUNCTION
PH LOCK	Indicates internal rf synthesizer phase lock loop is locked,
LEVEL CAL	Indicates output level of rf circuitry is correct.

Section II OPERATION UNDER USUAL CONDITIONS

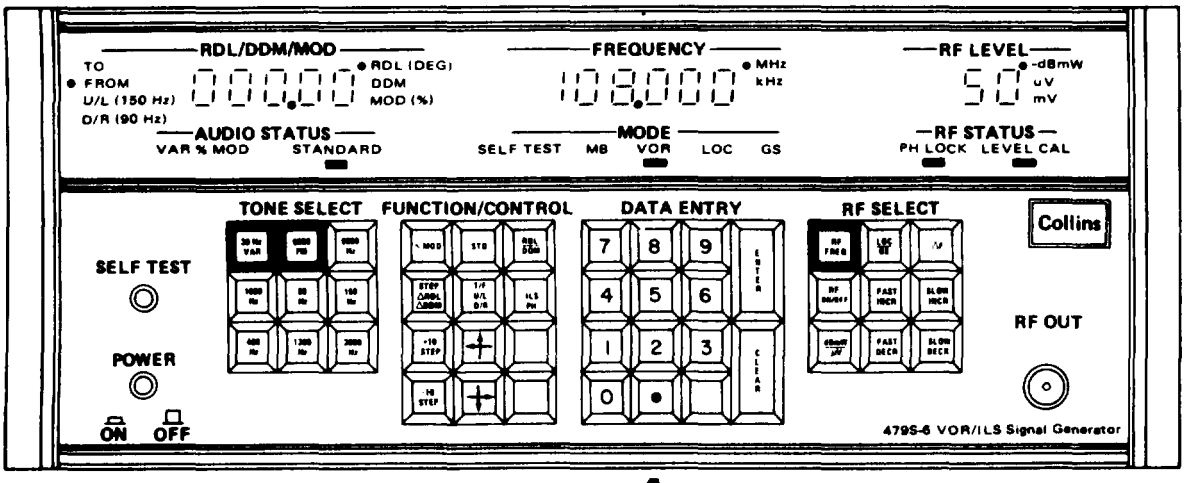
2-3. INITIAL POWER ON CHECK AND SELF-TEST.

1. Press POWER switch to ON.

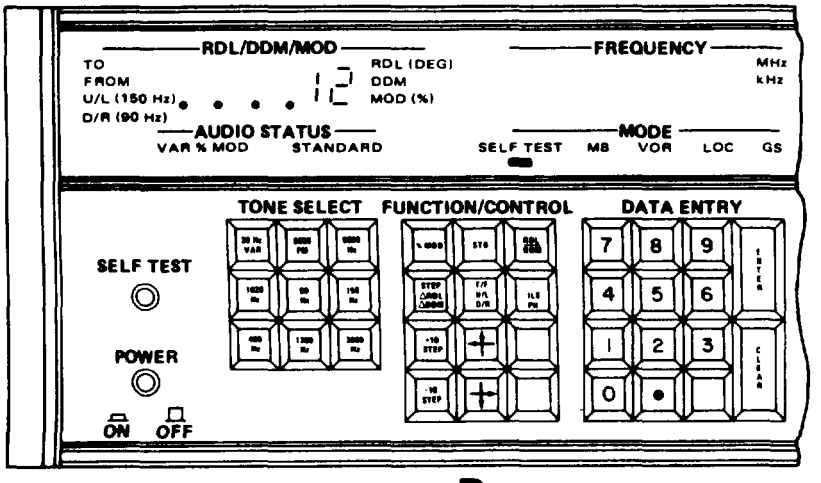
2. Observe that test set displays, keys and indicators go blank for a short time and then display the VOR preset mode (see view A). Also observe that blower motor operates.

3. If RDl/DDM/MOD display and SELF TEST indicator are flashing on and off (see view B), turn off test set and refer equipment to higher level of maintenance.

2-3. INITIAL POWER ON CHECK AND SELF-TEST. (CONT)



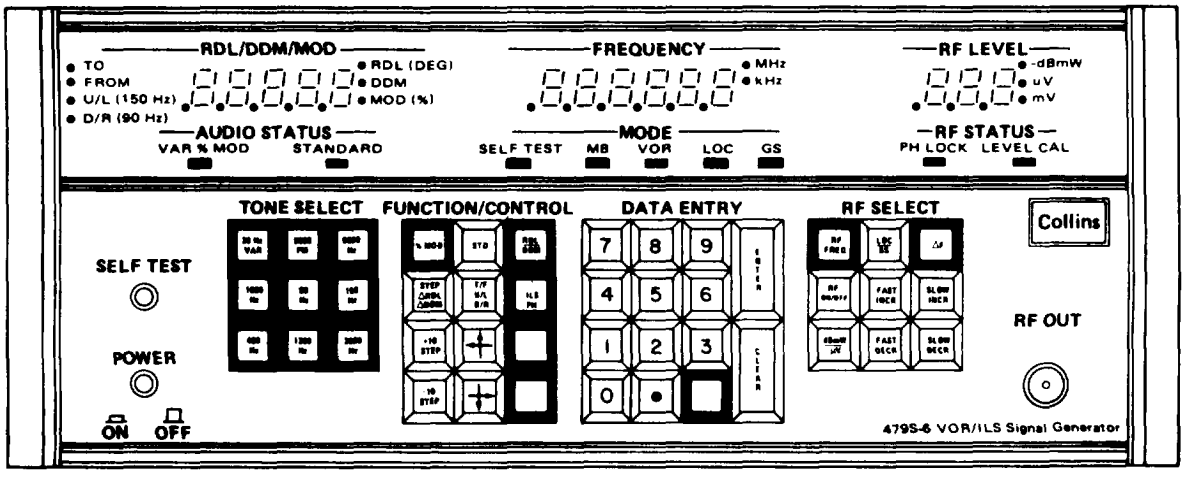
VIEW A



VIEW B

EL9LX017

2-3. INITIAL POWER ON CHECK AND SELF-TEST. (CONT)



EL9LX018

3. Press and hold SELF TEST switch for lamp check and observe that displays, indicators, and keys appear as shown above. If not, refer test set to higher level of maintenance.

4. Release SELF TEST switch and observe that the RDL/DDM/MOD display counts sequentially from 01 to 14 and that the test set switches to 108.000 MHz VOR MODE preset power on condition.

NOTE

If memory check fails, the SELF TEST MODE indicator and a displayed number from 01 to 14 will flash on and off. Turn test set off and refer it to higher level of maintenance.

Self test may be performed at any time to check the integrity of the test set.

2-4. OPERATING PROCEDURES.

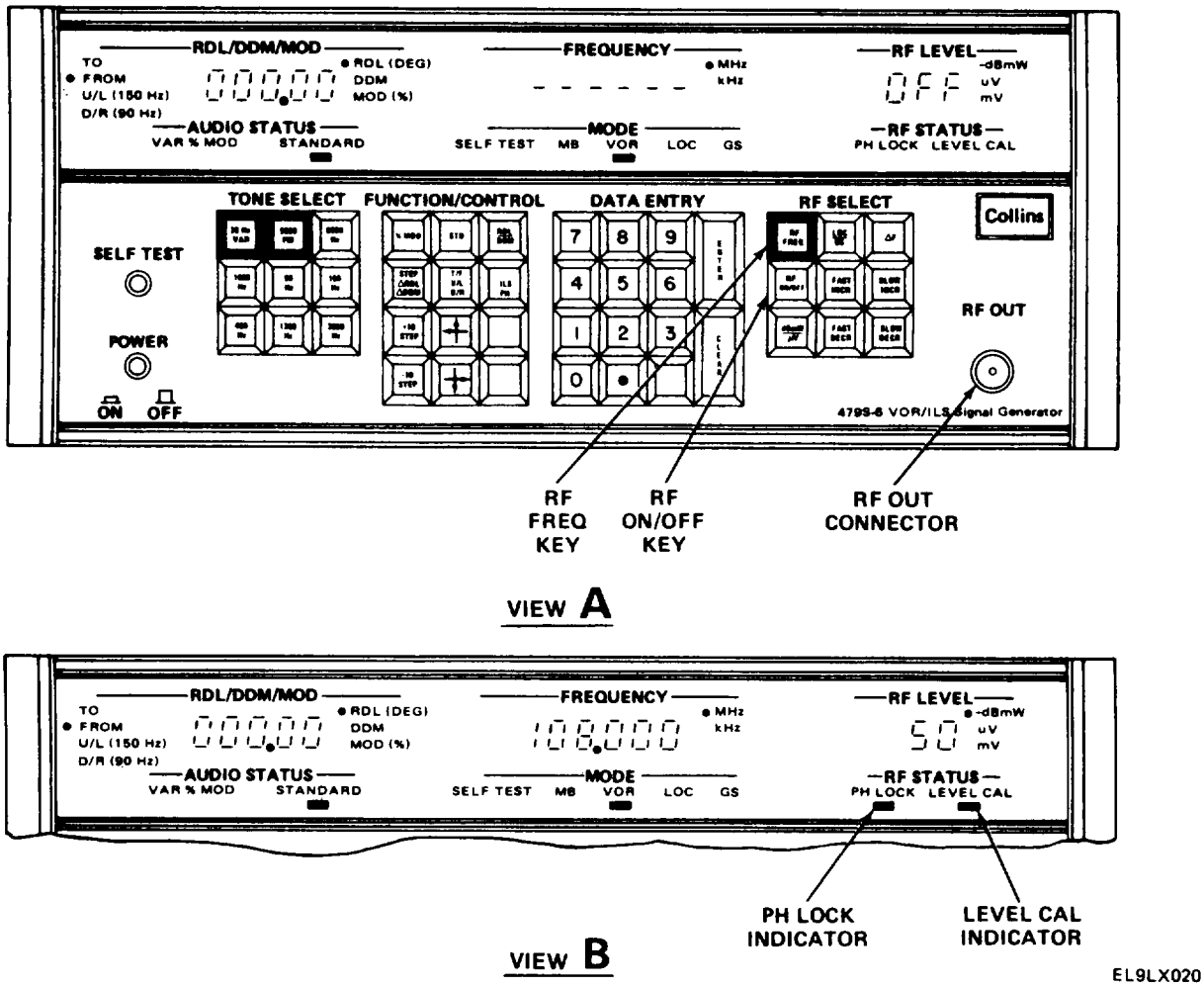
Operation of test set is accomplished by the operator using the keyboard to select and enter carrier frequencies and test functions.

NOTE

The following procedures are to familiarize the operator with certain test set features that might be used in performing receiver tests.

Press POWER switch to ON and check all modes as follows:

RF OUTPUT CONTROL



1. Press and hold RF ON/OFF key until RF LEVEL display changes from 50 to OFF.

This indicates that output of RF OUT connector is off. Displays, indicators, and keys appear as shown in view A.

2-4. OPERATING PROCEDURES. (CONT)

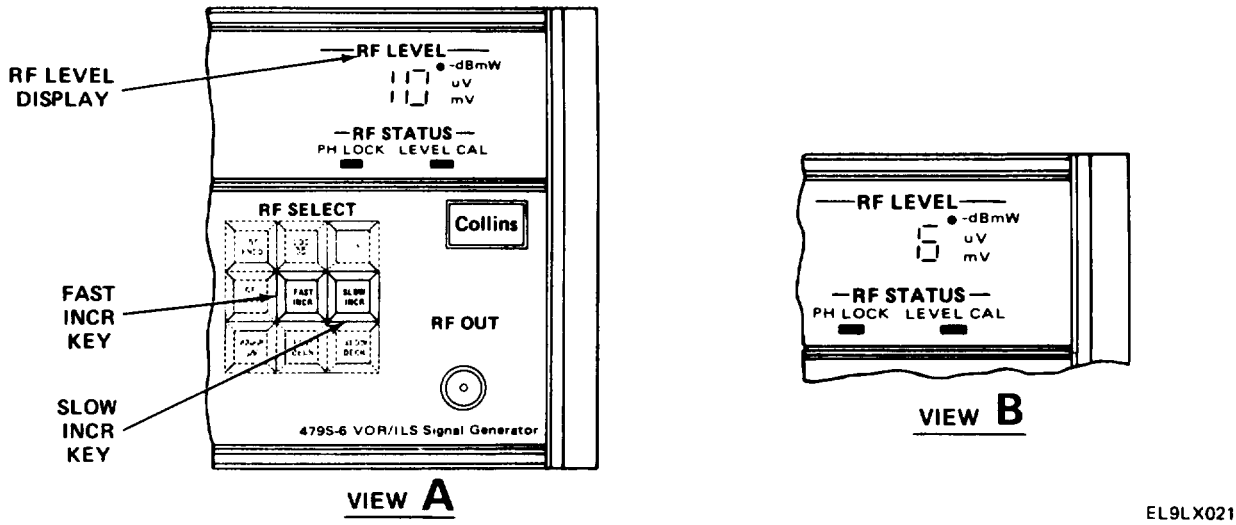
2. Press and hold RF ON/OFF key until RF LEVEL display changes from OFF to 50.

NOTE

This indicates that output of RF OUT connector is ON. Displays, indicators, and keys appear as shown in view B, page 2-12.

When rf output is on, PH LOCK and LEVEL CAL indicators are lit, indicating internal rf synthesizer phase lock loop is locked and output level of rf circuity is correct. (See view B, page 2-12.)

RF Output Level Increase



NOTE

The following step will cause rf output level to increase in 10 (-dB mw) in 10 db steps.

1. Press and hold FAST INCR key until 10 appears in RF LEVEL display shown in view A above.

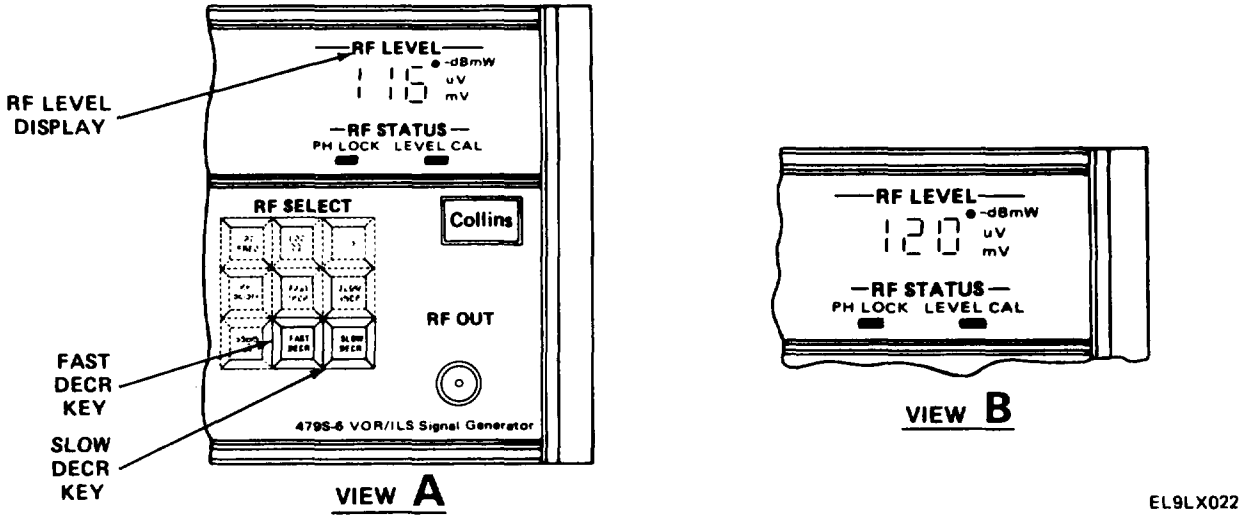
NOTE

The following step will cause rf output level to increase in 6 (-dB mw) in 1 db steps.

2. Press and hold SLOW INCR key until 6 appears in RF LEVEL display as shown in view B above.

2-4. OPERATING PROCEDURES. (CONT)

RF Output Level Decrease



NOTE

The following step will cause rf output level to decrease to 116 (-dB mw) in 10 db steps.

1. Press and hold FAST DECR key until 116 appears in RF LEVEL display as shown in view A above.

NOTE

The following step will cause rf output level to decrease to 120 (-dB mw) in 1 db steps.

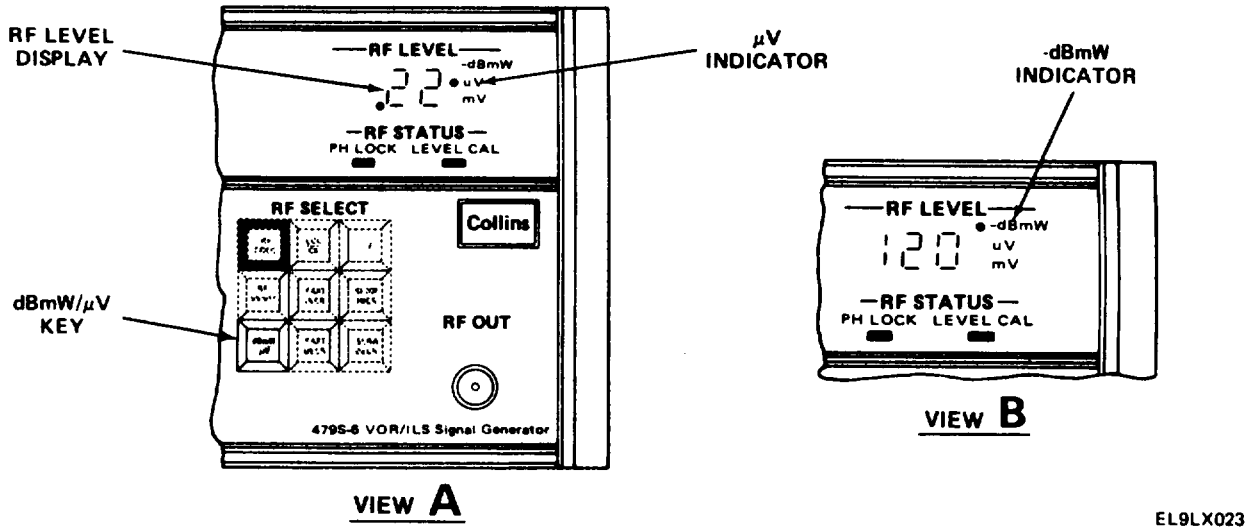
2. Press and hold SLOW DECR key until 120 appears in RF LEVEL display as shown in view B above.

RF Output Reference Level Change

NOTE

The rf output can be read in decibels (-dB mw) or voltage (KV or mv) depending on test requirements. The following step will cause RF LEVEL display to read in voltage.

2-4. OPERATING PROCEDURES. (CONT)



Press and hold d B mW/μV key until .22 appears in RF LEVEL display as shown in view A above.

NOTE

μV indicator lights to indicate a reading in microvolts.

The following step causes RF LEVEL display to read in decibels.

2. Press and hold dB mW/μV key until 120 appears in RF LEVEL display as shown in view B above.

NOTE

-dB mW indicator lights to indicate a reading in decibels.

3. Press POWER switch to OFF.

2.4. OPERATING PROCEDURES. (CONT)

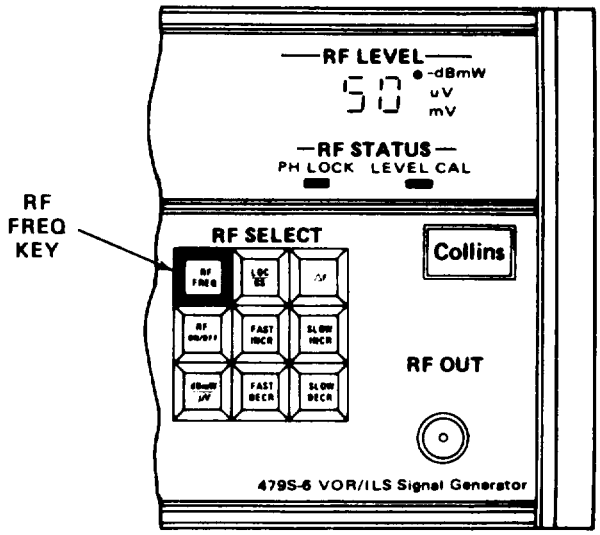
NOTE

The applicable receiver is connected to test set for the following procedures.

While performing these procedures, observe receiver indicators for correct test responses.

Press POWER switch to ON and check all modes as follows:

FREQUENCY/MODE SELECTION



EL9LX024

1. Check that RF FREQ key is lit.

NOTE

Lit condition of RF FREQ key indicates DATA ENTRY keys are ready to receive rf carrier frequency selections.

2. If RF FREQ key is not lit, press key.

2-4. OPERATING PROCEDURES. (CONT)

N O T E

An rf carrier frequency is entered into test set in the following step. Table 2-11 provides a list of standard frequencies.

TABLE 2-11. STANDARD VOR, LOCALIZER, GLIDESLOPE, AND MARKER BEACON FREQUENCIES

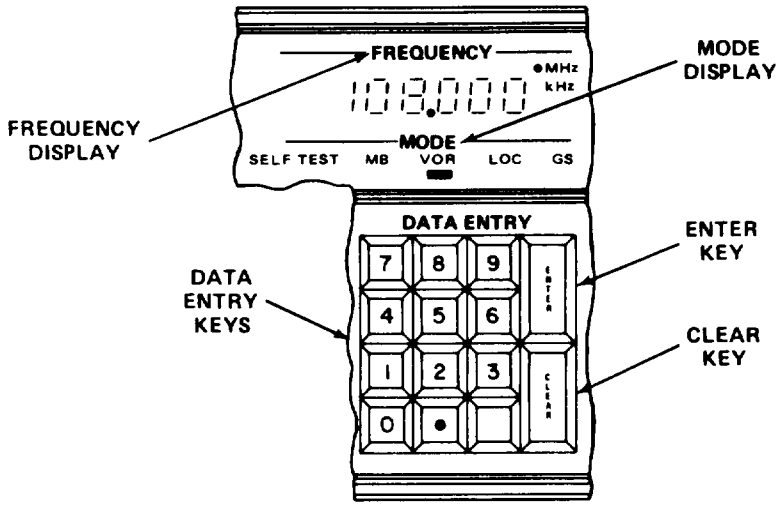
VOR FREQUENCIES (MHz)			PAIRED ILS FREQUENCIES		MARKER BEACON FREQUENCY (MHz)
			LOCALIZER (MHz)	GLIDE SLOPE (MHz)	
108.00	112.70	115.40	108.10	334.70	75.000 (Standard Marker Beacon Frequency)
108.05	112.75	115.45	108.15	334.55	
108.20	112.80	115.50	108.30	334.10	
108.25	112.85	115.55	108.35	333.95	
108.40	112.90	115.60	108.50	329.90	
108.45	112.95	115.65	108.55	329.75	
108.60	113.00	115.70	108.70	330.50	
108.65	113.05	115.75	108.75	330.35	
108.80	113.10	115.80	108.90	329.30	
108.65	113.15	115.85	108.95	329.15	
109.00	113.20	115.90	109.10	331.40	
109.05	113.25	115.95	109.15	331.25	
109.20	113.30	116.00	109.30	332.00	
109.25	113.35	116.05	109.35	331.85	
109,40	113.40	116.10	109.50	332.60	
109.45	113.45	116.15	109.55	332.45	
109.60	113.50	116.20	109.70	333.20	
109.65	113.55	116.25	109.75	333.05	
109.80	113.60	116.30	109.90	333.80	
109.85	113.65	116.35	109.95	333.65	
110.00	113.70	116.40	110.10	334.40	
110.05	113.75	116.45	110.15	334.25	
110.20	113.80	116.50	110.30	335.00	
110.25	113.85	116.55	110.35	334.85	

2-4. OPERATING PROCEDURES. (CONT)

TABLE 2-11. STANDARD VOR, LOCALIZER, GLIDESLOPE, AND MARKER BEACON FREQUENCIES (CONT)

VOR FREQUENCIES (MHz)			PAIRED ILS FREQUENCIES		MARKER BEACON FREQUENCY (MHz)
			LOCALIZER (MHz)	GLIDE SLOPE (MHz)	
110.40	113.90	116.60	110.50	329.60	
110.45	113.95	116.65	110.55	329.45	
110.60	114.00	116.70	110.70	330.20	
110.65	114.05	116.75	110.75	330.05	
110.80	114.10	116.80	110.90	330.80	
110.85	114.15	116.85	110.95	330.65	
111.00	114.20	116.90	111.10	331.70	
111.05	114.25	116.95	111.15	331.55	
111.20	114.30	117.00	111.30	332.30	
111.25	114.35	117.05	111.35	332.15	
111.40	114.40	117.10	111.50	332.90	
111.45	114.45	117.15	111.55	332.75	
111.60	114.50	117.20	111.70	333.50	
111.65	114.55	117.25	111.75	333.35	
111.80	114.60	117.30	111.90	331.10	
111.85	114.65	117.35	111.95	330.95	
112.00	114.70	117.40			
112.05	114.75	117.45			
112.10	114.80	117.50			
112.15	114.85	117.55			
112.20	114.90	117.60			
112.25	114.95	117.65			
112.30	115.00	117.70			
112.35	115.05	117.75			
112.40	115.10	117.80			
112.45	115.15	117.85			
112.50	115.20	117.90			
112.55	115.25	117.95			
112.60	115.30				
112.65	115.35				

2.4. OPERATING PROCEDURES. (CONT)



EL9LX025

3. Enter selected rf carrier frequency into test set using DATA ENTRY keys.

4, Press and release ENTER key.

NOTE

If FREQUENCY display starts flashing on and off, press CLEAR key until flashing stops. Reenter correct frequency and repeat steps 3 and 4.

5. Observe FREQUENCY display and note that it shows selected rf carrier frequency in MHz.

6, Observe MODE display and note that it shows correct mode of operation (VOR, MB, LOC, GS) for selected frequency.

NOTE

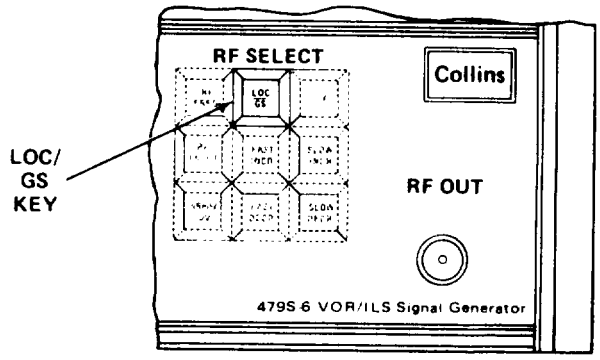
The following steps produce selections of paired ILS (glide slope and localizer) frequencies.

7. Enter localizer or glide slope rf carrier frequency into test set using DATA ENTRY keys.

8. Press and release ENTER key.

9. Observe FREQUENCY display and note that it shows selected rf carrier frequency.

2-4. OPERATING PROCEDURES. (CONT)



EL9LX026

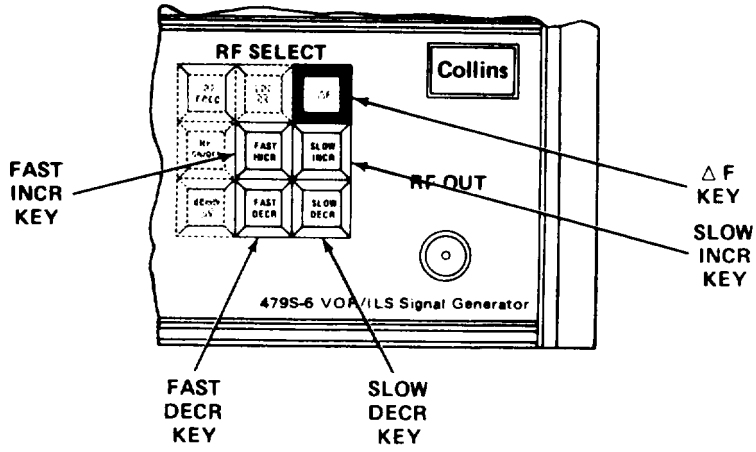
10. Press and hold LOC/GS key until FREQUENCY display changes to the corresponding paired rf carrier frequency.

11. Press and hold LOC/GS key again until FREQUENCY display changes back to originally selected rf carrier frequency.

RF FREQUENCY SLEWING

NOTE

To check receiver selectivity, selected rf carrier frequency can be slewed (increased or decreased) from its original setting.



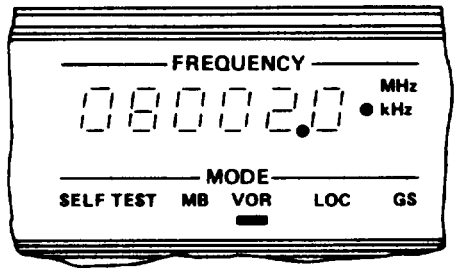
EL9LX027

2-4. OPERATING PROCEDURES. (CONT)

1. Press and hold ΔF key until it lights.

NOTE

ΔF key lights indicating FAST INCR, SLOW INCR, FAST DECR, and SLOW DECR keys are ready for use.



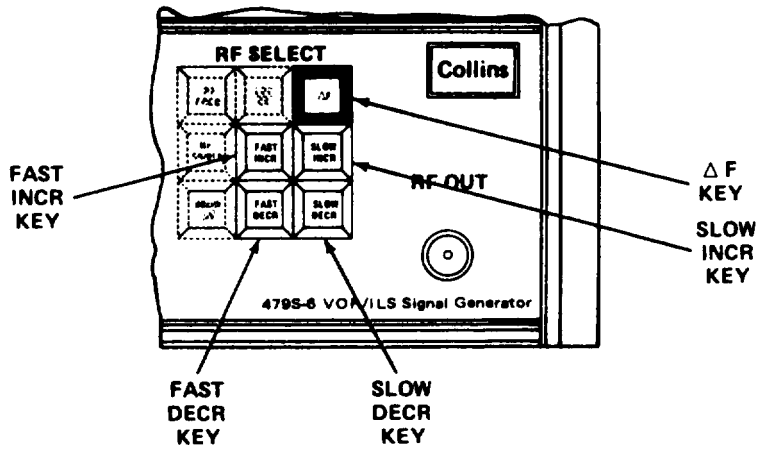
EL9LX028

NOTE

After A F key is pressed, FREQUENCY display changes from MHz to kHz indications dropping the most significant numeral of selected rf carrier frequency.

The following step will cause selected rf carrier frequency to increase at a fast rate.

2-4. OPERATING PROCEDURE. (CONT)



EL9LX027

2. Press and hold FAST INCR key until FREQUENCY display stops increasing.

NOTE

The following step will return original rf carrier frequency.

3. Press and hold ΔF key until its lamp goes off.

NOTE

FREQUENCY display now shows selected rf carrier frequency In MHz.

FREQUENCY display MHz indicator is lit.

4. Press and hold Δ F key until It lights.

NOTE

The following step will cause selected rf carrier frequency to decrease at a fast rate.

5. Press and hold FAST DECR key until FREQUENCY display stops decreasing.

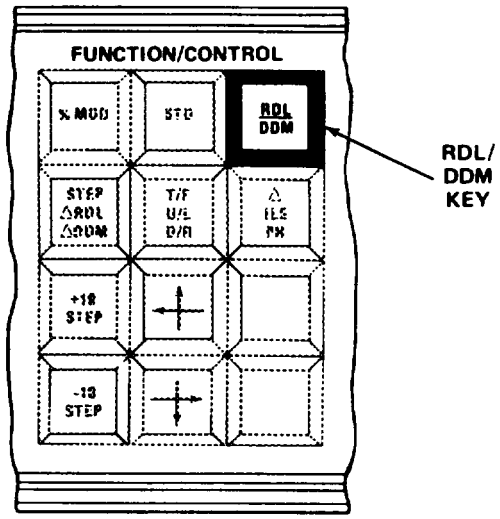
6. Repeat step 3.

NOTE

SLOW INCR and SLOW DECR keys operate in the same manner as FAST INCR and FAST DECR keys, but at a slower rate.

2-4. OPERATING PROCEDURES. (CONT)

VOR RADIAL SELECTION AND ADJUSTMENT



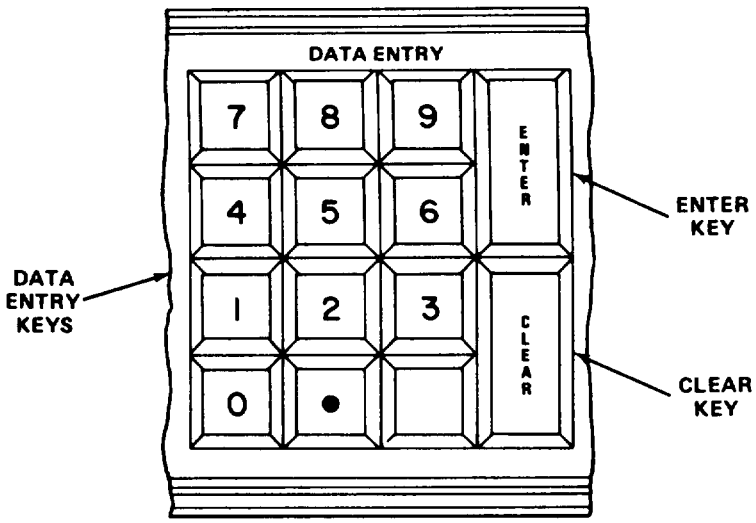
EL9LX030

1. Select any standard VOR rf carrier frequency from table 2-11, and enter it into test set (FREQUENCY/MODE SELECTION, steps 1 through 6, page 2-16).

2. Press and hold RDL/DDM key until it lights.

NOTE

RDL/DDM key lights indicating DATA ENTRY keys are ready to be used for entry of selected radials. When RDL/DDM key is pressed, RF FREQ key lamp goes off. VOR radial is selectable from 000.00 to 359.99 degrees in 0.01-degree increments.



EL9LX031

3. Using DATA ENTRY keys, enter selected VOR radial.

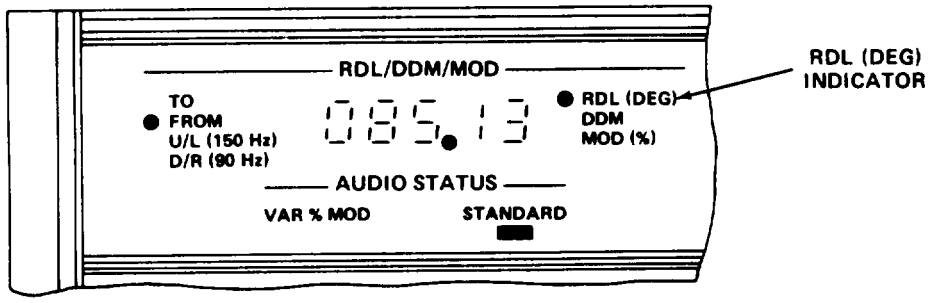
4. Press and release ENTER key.

2.4. OPERATING PROCEDURES. (CONT)

NOTE

If RDL/DDM/MOD display begins to flash on and off, press and hold CLEAR key until display stops flashing. Repeat steps 2 and 3 to reenter correct radial.

5. Observe RDL/DDM/MOD display and note that it shows selected VOR radial.



EL9LX032

NOTE

RDL (DEG) indicator is lit to indicate a VOR radial reading in degrees.

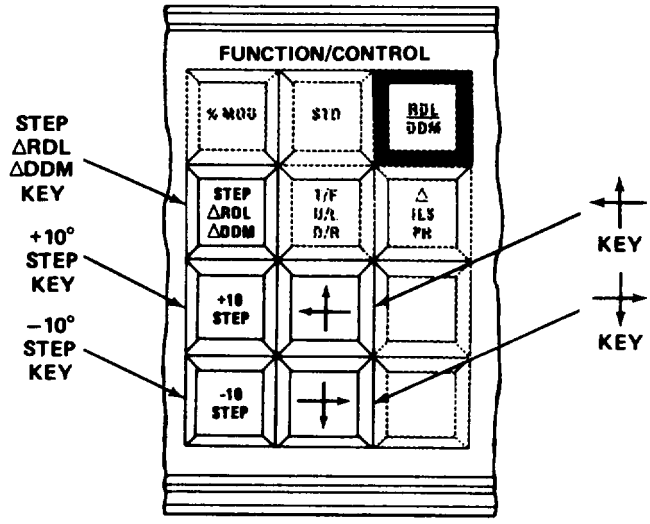
RDL/DDM key remains lit after radial selection so additional radial selections can be made.

Radial is adjustable from selected radial in + 30, + 10, -10, +0.01, and -0.01 degree steps.

The following step sets VOR radial to 000.00.

6. Using DATA ENTRY keys, enter VOR radial of 000.00.

24. OPERATING PROCEDURES. (CONT)



7. Press ENTER key.

NOTE

The following step increases VOR radial to 030.00.

8. Press and hold STEP Δ RDL Δ DDM key until RDL/DDM/MOD display changes from 000.00 to 030.00.

NOTE

Each time STEP Δ RDL Δ DDM key is pressed, VOR radial will increase in X)-degree steps.

Holding STEP Δ RDL Δ DDM key depressed does not provide continuous 30-degree step increases.

The following step increases VOR radial by 10 degrees.

9. Press and hold + 10° STEP key until RDl/DDM/MOD display increases by 10 degrees.

NOTE

Each time + 10°STEP key is pressed, VOR radial will increase in 10-degree steps.

Holding + 10° STEP key depressed does not provide continuous lo-degree step increases.

2-4. OPERATING PROCEDURES. (CONT)

NOTE

The following step decreases VOR radial by 10 degrees.

10. Press and hold -10° STEP key until RDL/DDM/MOD display decreases by 10 degrees.

NOTE

Each time -10° STEP key is pressed, VOR radial will decrease in 10-degree steps.

Holding -10° STEP key depressed does not provide continuous 10-degree step decreases.

The following step increases VOR radial in 0.01-degree steps.

11. Press and hold + key.

NOTE

Holding + key depressed provides continuous 0.01-degree step Increases.

12. Release + key.

NOTE

The following step decreases VOR radial in 0.01-degree steps.

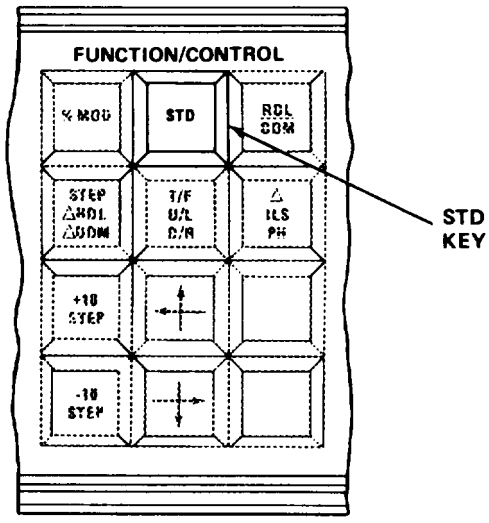
13. Press and hold + key.

NOTE

Holding + key depressed provides continuous 0.01-degree step decreases.

14. Release + key.

2-4. OPERATING PROCEDURES. (CONT)



EL9LX034

NOTE

The following step will return RDL/DDM/MOD display to VOR mode preset condition.

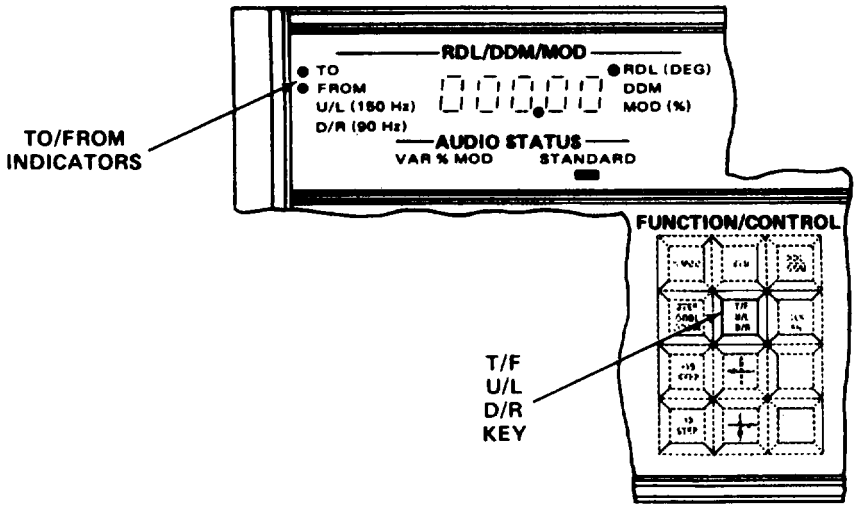
15. Press and hold STD key until RDL/DDM/MOD display returns to VOR mode preset condition.

NOTE

The RDL/DDM key lamp goes off and RF FREQ key lights. DATA ENTRY keys can now be used to enter standard rf carrier frequencies as before.

STD key can be used anytime to return RDL/DDM/MOD display to preset condition for selected mode of operation (VOR, locaiizer, glide slope, or marker beacon).

2-4. OPERATING PROCEDURES. (CONT)



EL9LX035

NOTE

The following step will cause test set to switch from a FROM radial to a TO radial, or vice versa (VOR mode only).

16. Press and hold T/F U/L D/R key until TO Indicator goes off and FROM indicator goes on, or vice versa.

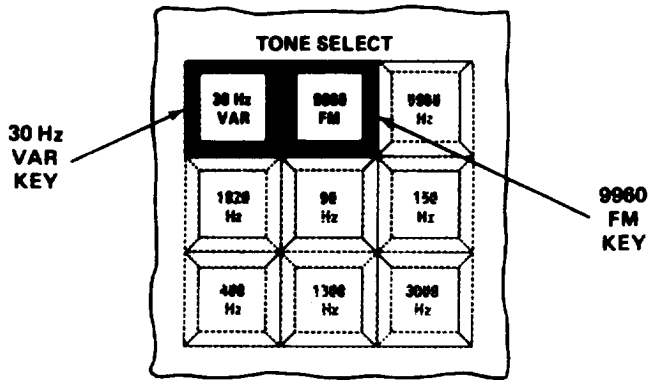
NOTE

Each time T/F U/L D/R key is pressed, test set will change from a TO radial to a FROM radial, or vice versa. TO/FROM indicator will change accordingly.

17. Press STD key once.

2-4. OPERATING PROCEDURES. (CONT)

VOR MODE TONE SELECTIONS



E L9LX036

NOTE

The following step removes 30 Hz variable signal from VOR rf carrier signal.

1. Press and hold 30 Hz VAR key until its lamp goes off.

NOTE

The following step returns 30 Hz variable signal.

2. Press and hold 30 Hz VAR key until it lights.

NOTE

The following step removes 30 Hz reference signal.

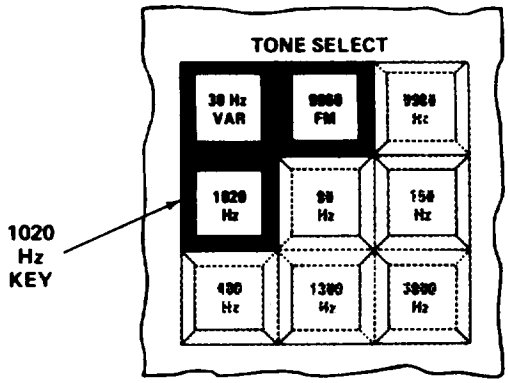
3. Press and hold 9960 FM key until its lamp goes off.

NOTE

The following step returns 30 Hz reference signal.

4. Press and hold 9960 FM key until it lights.

2-4. OPERATING PROCEDURES. (CONT)



EL9LX037

NOTE

The following step adds audio 1020 Hz tone to VOR rf carrier signal.

5. Press 1020 Hz key until it lights.

NOTE

The following step removes 1020 Hz audio tone.

6. Press 1020 Hz key until its lamp goes off.

LOCALIZE/GLIDE SLOPE DDM SELECTION AND ADJUSTMENT

1. Select any standard localizer or glide slope rf carrier frequency, from table 2-11, and enter It into test set (FREQUENCY/MODE SELECTION, steps 1 through 6, page 2-16).

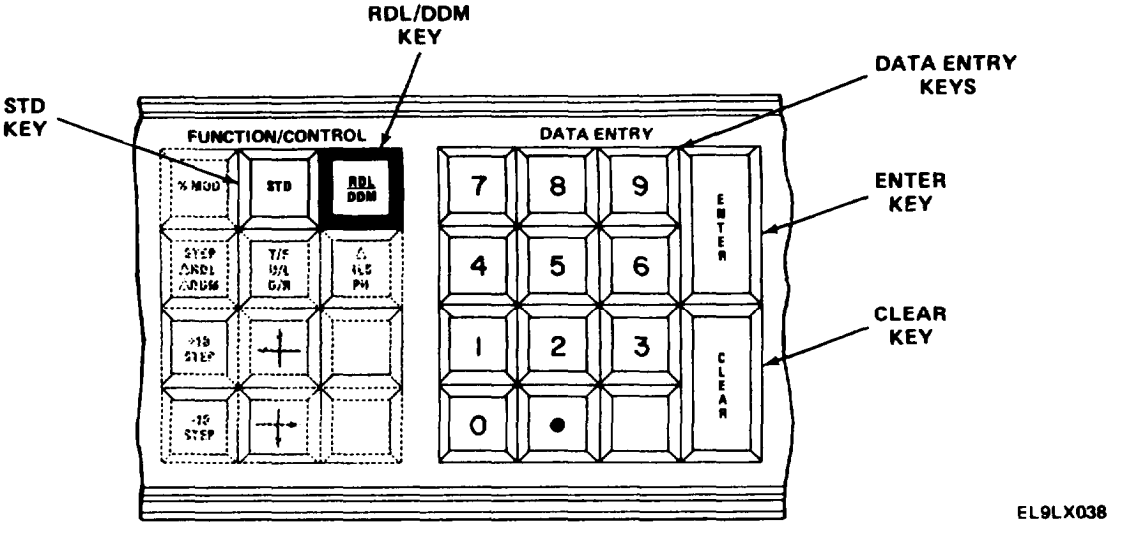
NOTE

In the steps that follow, it is required to enter STD DDM STEPS into test set. Refer to table 2-12 for these values.

TABLE 2-12. STANDARD DDM STEPS

MODE	STD DDM STEPS	MODE	STD DDM STEPS
Localizer	0.000 ± 0.046 ± 0.093 ± 0.155 ± 0.200	Glide slope	0.000 ± 0.045 ± 0.091 ± 0.175 ± 0.400

2-4. OPERATING PROCEDURES. (CONT)



NOTE

The following step will ready DATA ENTRY keys to accept entry of DDM selections.

2. Press and hold RDL/DDM key until it lights.

NOTE

The following step requires a selected DDM to be entered into test set using DATA ENTRY keys. The decimal point must be entered explicitly. For example, if 0.040 is to be entered, enter .04.

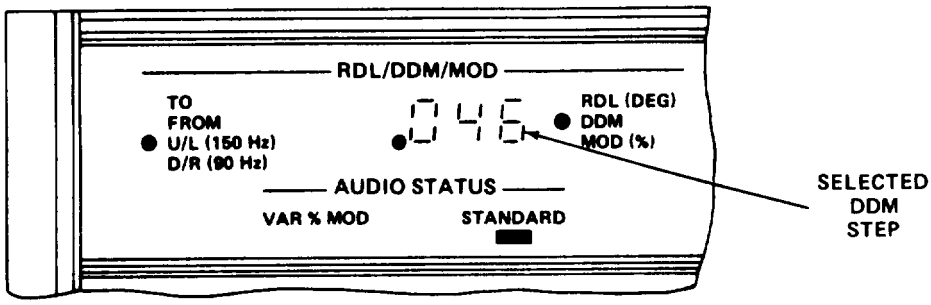
3. Using DATA ENTRY keys, enter a standard DDM step from table 2-12.

4. Press ENTER key once.

NOTE

If RDL/DDM/MOD display flashes on and off, press and hold CLEAR key until display stops flashing. Then, repeat step 3 and enter correct DDM step.

2-4. OPERATING PROCEDURES. (CONT)



E L9LX039

NOTE

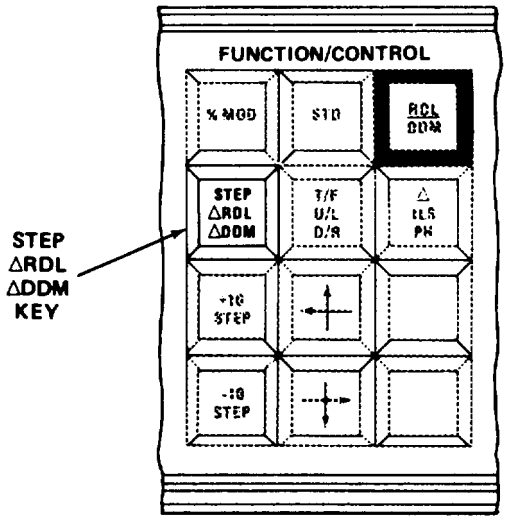
If DDM step has been entered correctly, RDL/DDM/MOD display will show selected DDM.

5. Return to localizer or glide slope preset mode by pressing STD key once.

NOTE

The following steps will cause test set to cycle through each STD DDM step listed in table 2-12, beginning with .000.

6. Press RDL/DDM key until it lights.



EL9LX040

2-4. OPERATING PROCEDURES. (CONT)

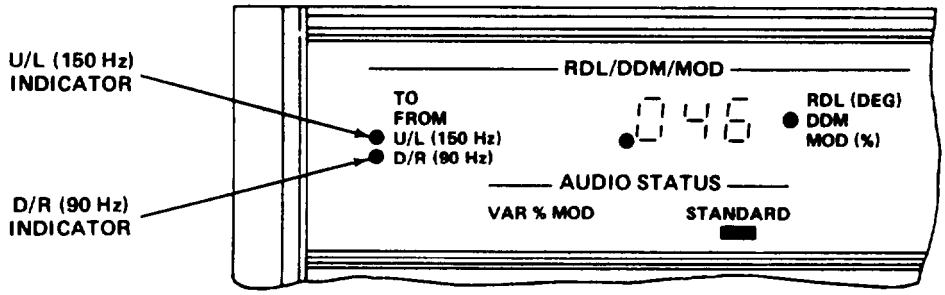
7. Press STEP D RDL D DDM key until RDL/DDM/MOD display indicates next step listed in table 2-12.

NOTE

Each time STEP D RDL D DDM key is pressed, test set switches to a new DDM step value until .000 is reached. Pressing STEP D RDL D DDM key again will repeat procedure.

Holding STEP D RDL D DDM key depressed does not provide continuous step increases.

8. Repeat step 7 for each STD DDM step listed in table 2-12 until .000 is indicated by RDL/DDM/MOD display.

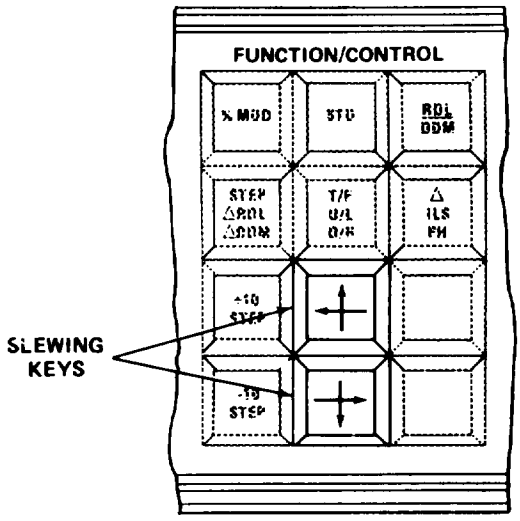


EL9LX041

NOTE

Each change of DDM step requires pressing STEP D RDL D DDM key. DDM will step In U/L (150 Hz) direction unless D/R (90 Hz) indicator is lit. If D/R (90 Hz) indicator is lit, DDM steps in D/R (90 Hz) direction until maximum deviation is reached, and next step returns DDM to .000 or beam center. At beam center, DDM returns to U/L (150 Hz) signal and indication and remains in U/L (150 Hz) condition until D/R (90 Hz) is again selected.

24. OPERATING PROCEDURES. (CONT)



EL9LX042

N O T E

The following step slews DDM, from a .000 reading, in U/L (150 Hz) direction in continuous 0.001 increments in localizer mode and 0.002 increments in glide slope mode.

9. 9. Press hold + key.

NOTE

RDL/DDM/MOD display shows an increasing DDM.

DDM can be stewed in this direction to a maximum of 0.400 in localizer mode and 0.800 in glide slope mode.

10. Release + key.

11. Using STEP D RDL D DDM key, step to DDM value of .000.

NOTE

The following step slews DDM, from a .000 reading, in D/R (90 Hz) direction, in continuous 0.001 increments in localizer mode and 0.002 increments in glide slope mode.

12. Press and hold + key.

NOTE

RDL/DDM/MOD display shows a decreasing DDM, and D/R (90 Hz) indicator is lit.

DDM can be slewed in this direction to a maximum of 0.400 in localizer mode and 0.800 in glide slope mode.

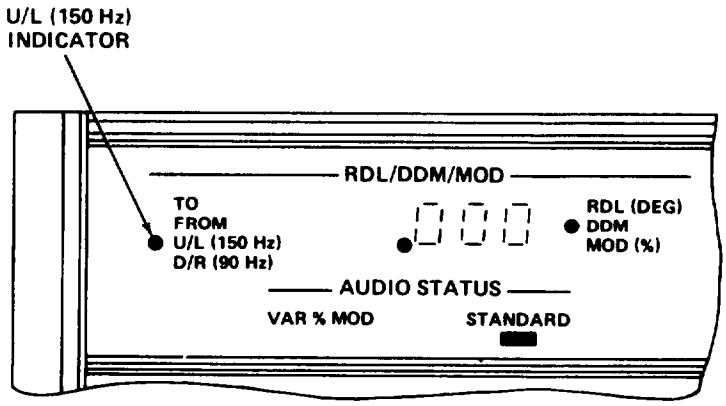
2-4. OPERATING PROCEDURES. (CONT)

13. Release + key.

14. Press STD key once.

15. Repeat steps 1 through 12 for other rf carrier frequencies.

DDM BALANCE CHECK ADJUSTMENTS



EL9LX043

NOTE

The following procedure is typical for discussion of test set operation and can be varied as required during actual receiver testing.

The following procedure applies to Iocalizer and glide slope modes only.

1. Using STEP D RDL D DDM key, enter standard DDM of .046.

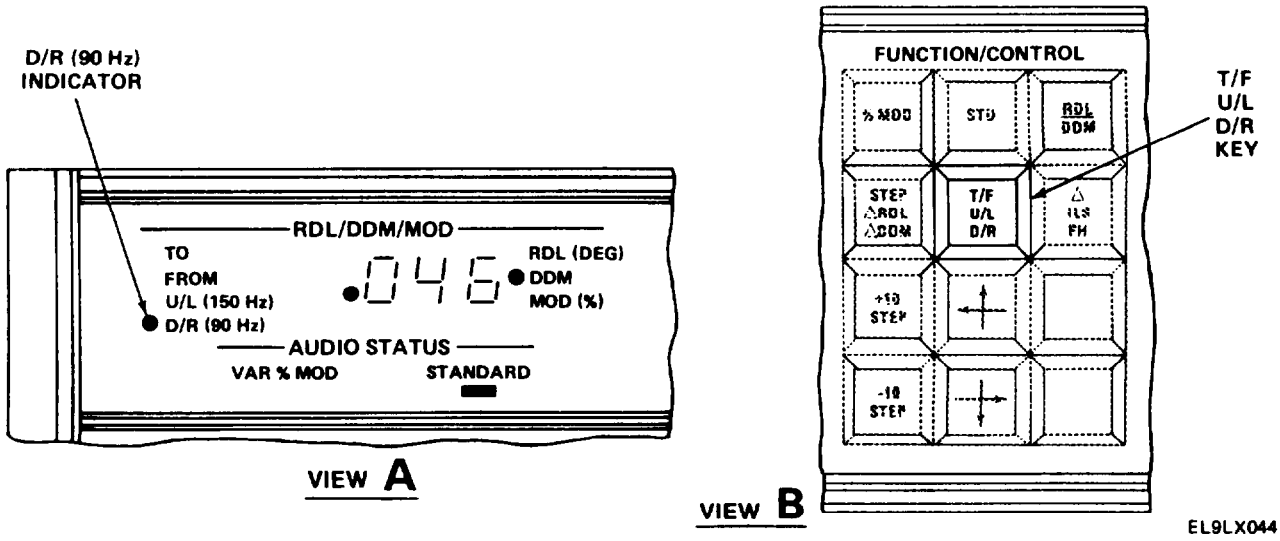
NOTE

If RDL/DDM/MOD display flashes on and off, press and hold CLEAR key until display stops flashing. Then, repeat step 1 and enter correct DDM.

If DDM step has been entered correctly, RDL/DDM/MOD display will show .046.

U/L (150 Hz) indicator is lit to indicate direction DDM will go when DDM is changed using STEP D RDL D DDM key, slewing keys, on DATA ENTRY keys.

2-4.. OPERATING PROCEDURES. (CONT)



N O T E

DDM can be changed in direction using T/F U/L D/R key. However, a DDM of at least .001 must be selected before localizer or glide slope signal can be switched to D/R (90 Hz).

The following step causes DDM to switch to DIR (90 Hz) direction.

Press and hold T/F U/L D/R key until D/R (90 Hz) indicator lights as shown in view A above.

3. Change DDM to next required DDM either by using DATA ENTRY keys, slewing keys, or STEP D RDL D DDM key.

NOTE

The following step causes DDM to switch back to U/L (150 Hz) direction.

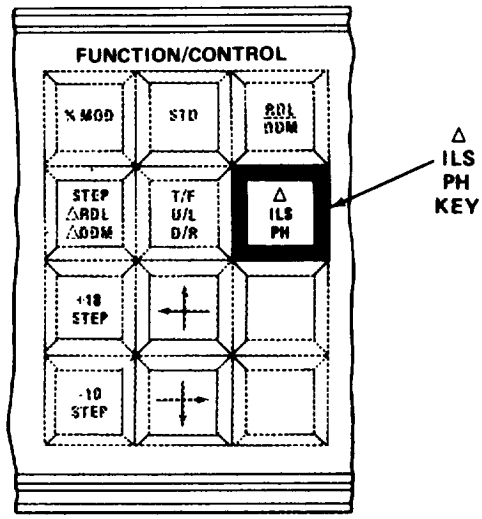
4. Press and hold T/F U/L D/R key until U/L (150 Hz) indicator lights.

LOCALIZE/GLIDE SLOPE (ILS) PHASE ADJUSTMENT

NOTE

The phase between the 90 and 150 Hz signals can be varied.

2-4. OPERATING PROCEDURES. (CONT)



EL9LX045

NOTE

The following step produces an ILS composite signal with a 60-degree phase shift between 90 and 150 Hz signals. (Phase shift = 60° of 150 Hz component, measured between positive-going zero crossings.)

1. Press Δ ILS PH key until it lights.

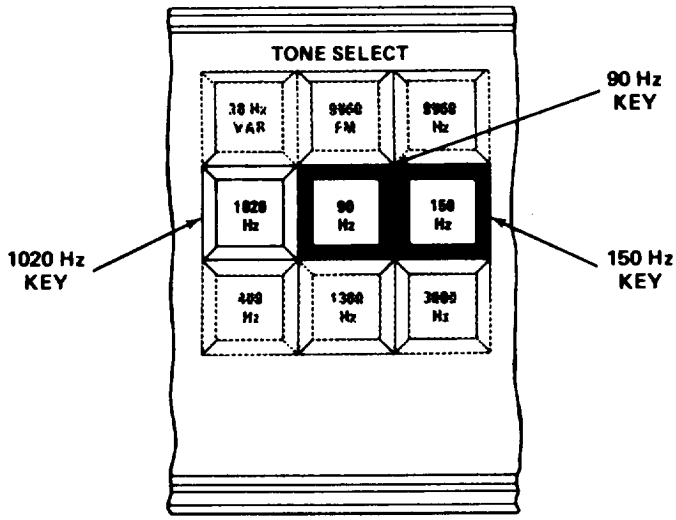
NOTE

The following step removes phase shift.

2. Press A ILS PH key until lamp goes off.

2-4. OPERATING PROCEDURES. (CONT)

AUDIO TONE SELECTION



EL9LX046

1. Enter a localizer rf carrier frequency into test set (FREQUENCY/MODE SELECTION, steps 1 through 6, page 2-16).

NOTE

The next step adds 1020 Hz audio identification tone to localizer signal. (The audio tone cannot be added to glide slope signal.)

2. Press and hold 1020 Hz key until it lights.

NOTE

The next step removes 1020 Hz audio tone.

3. Press and hold 1020 Hz key until its lamp goes off.

NOTE

The next step removes 90 Hz audio modulation signal for a flag check (localizer or glide slope modes).

4. Press and hold 90 Hz key until its lamp goes off.

NOTE

The next step returns 90 Hz audio modulation signal.

5. Press and hold 90 Hz key until it lights.

2-4. OPERATING PROCEDURES. (CONT)

NOTE

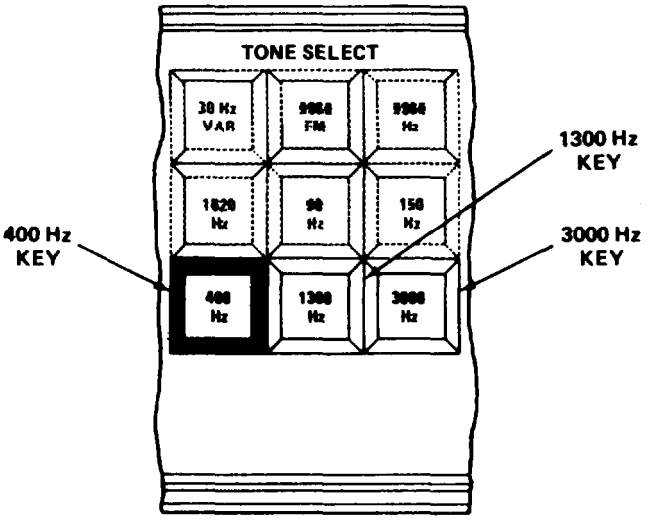
150 Hz key operates in same manner as 90 Hz key, except 150 Hz audio modulation signal is controlled.

6. Repeat steps 4 and 5 using 150 Hz key.

NOTE

Both 90 Hz and 150-Hz signals can be removed (at the same time) to perform a flag check or for other tests.

MARKER BEACON MARKER SELECTION



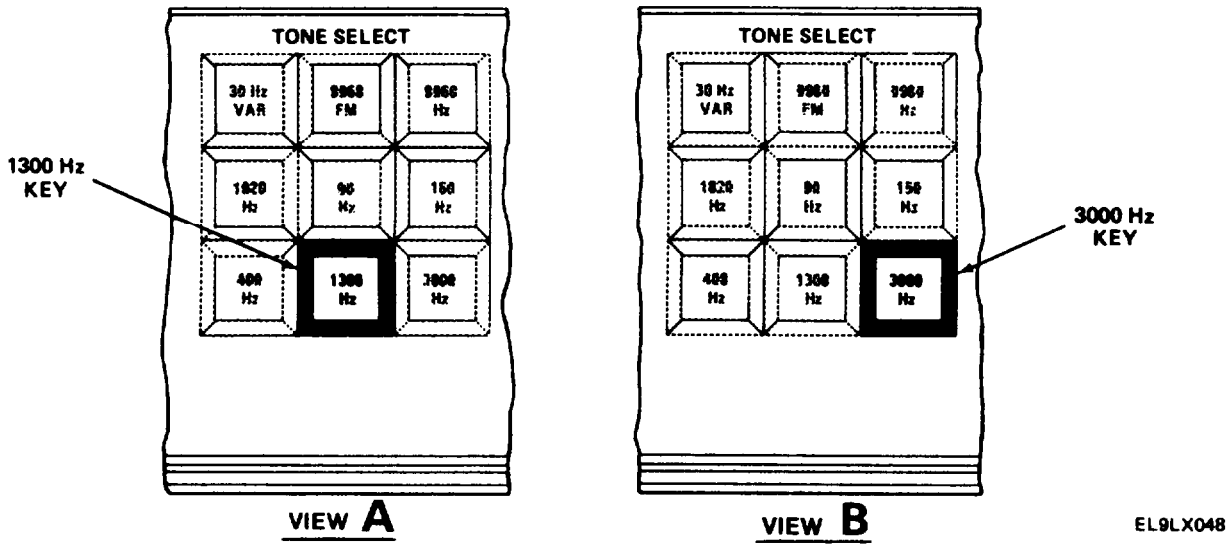
EL9LX047

1. Enter a marker beacon rf carrier frequency into test set (FREQUENCY/MODE SELECTION, steps 1 through 6, page 2-16).

NOTE

Outer marker beacon (400 Hz) is automatically selected when a marker beacon rf carrier frequency is selected. 400 Hz key lights to indicate this condition.

24. OPERATING PROCEDURES. (CONT)



NOTE

The following step produces middle marker beacon tone (1300 Hz). (See view A above.)

2. Press and hold 1300 Hz key until it lights.

NOTE

400 Hz key lamp automatically goes off when another marker beacon tone is selected.

The following step produces outer marker beacon tone (3000 Hz). (See view B above.)

3. Press and hold 3000 Hz key until it lights.

NOTE

1300 Hz key lamp automatically goes off as outer marker beacon signal is selected.

All marker beacon tones maybe removed if desired.

MARKER BEACON INTERFERENCE CHECK

NOTE

Standard marker beacon ground station frequency is 75.000 MHz. Test set is capable of producing rf frequencies from 74.6 to 75.4 MHz to provide generation of interference - type signals.

2-4. OPERATING PROCEDURES. (CONT)

1. Using DATA ENTRY keys, enter a marker beacon interference-type signal into test set.

2. Repeat step 1 using a different frequency interference -type signal (if required).

PERCENT MODULATION ADJUSTMENT

NOTE

In preset condition for each mode of operation, the percent modulation is automatically set to the accepted standard. The percent modulation can be varied from standard in both directions In 0.1-percent steps. Table 2-13 lists percent modulations for preset conditions and variable range with respect to each mode of operation.

TABLE 2-13. PERCENT Modulation CHART

MODE	PERCENT MODULATION	
	PRESET CONDITION	VARIABLE RANGE
VOR	30.0	10.0 to 35.0
Localizer	20.0	5.0 to 40.0
Glide slope	40.0	10.0 to 80.0
Marker beacon	95.0	90.0 to 97.0

NOTE

In localizer and glide slope modes of operation, DDM must be set to 0.000 before percent modulation can be varied.

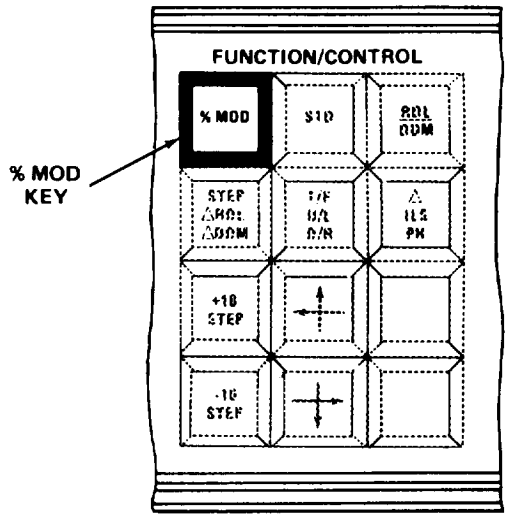
1020 Hz audio tone amplitude modulation is a fixed 30 percent in VOR and localizer modes. 1020 Hz tone Is not present in glide slope mode.

1. Enter selected rf carrier frequency from table 2-11 into test set (FREQUENCY/MODE SELECTION, steps 1 through 6, page 2-16).

NOTE

In marker beacon mode, percent modulation is displayed in RDL/DDM/MOD display upon selection of a marker beacon rf carrier frequency without pressing % MOD key.

2-4. OPERATING PROCEDURES. (CONT)



EL9LX049

NOTE

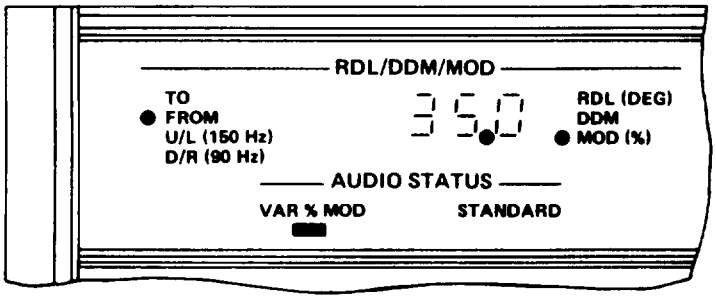
The following step will ready DATA ENTRY keys to accept percent modulation selections.

2. Press and hold % MOD key until it lights.

NOTE

VAR % MOD indicator lights to indicate DATA ENTRY keys are ready to receive percent modulation selections.

3. Select a percent modulation step from VARIABLE RANGE column of table 2-13, and enter it into test set using DATA ENTRY keys.



EL9LX050

2.4. OPERATING PROCEDURES. (CONT)

NOTE

RDL/DDM/MOD display indicates selected percent modulation.

4. **Repeat step 3 as required.**

5. **Repeat steps 1 through 4 for each mode of operation as required.**

6. **Press POWER switch to OFF.**

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

3-1. SPECIAL TOOLS.

See appendix B, Maintenance Allocation Chart (MAC), in back of manual. Also refer to the repair parts and special tools list, TM 11-6625-2975-24P, covering organizational maintenance for this equipment.

3-2. REPAIR PARTS.

Repair parts are listed in the repair parts and special tools list, TM 11-6625-2975-24P, covering organizational maintenance for this equipment.

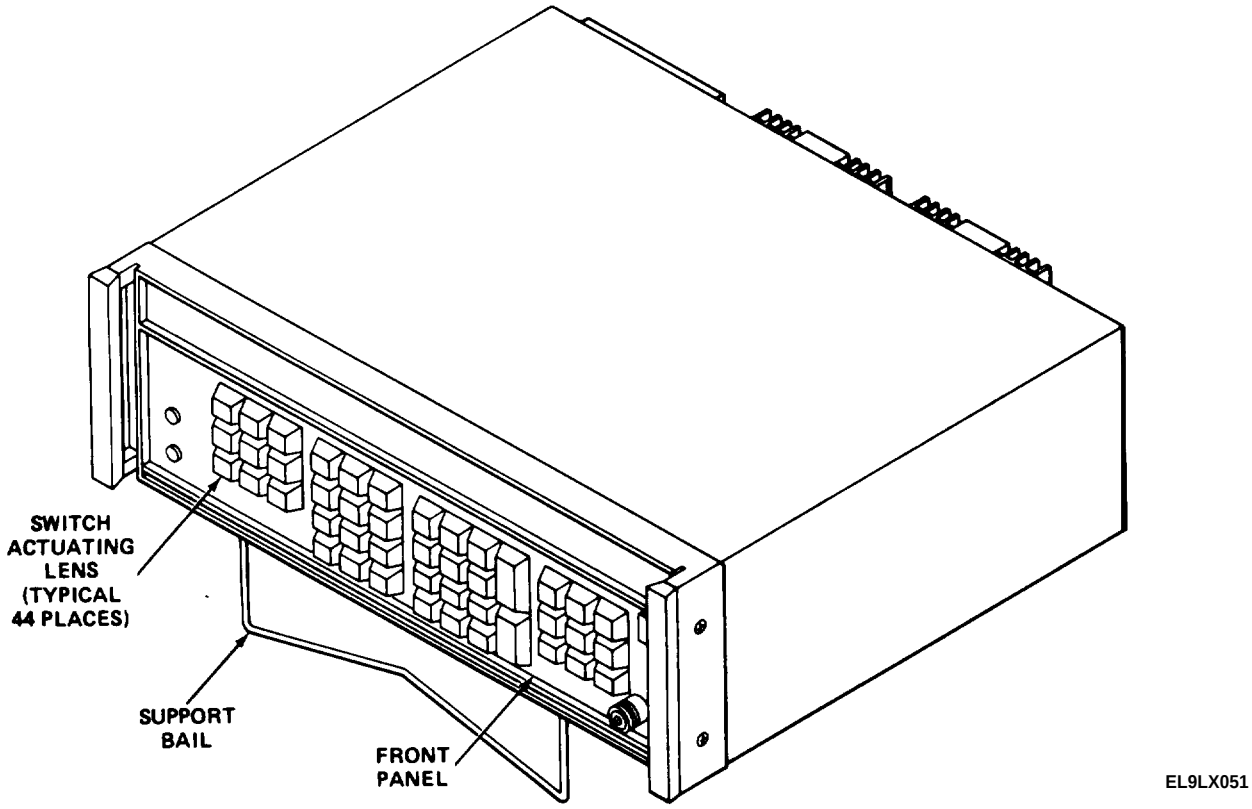
Section II SERVICE UPON RECEIPT

3-3. UNPACKING AND INSPECTION.

Carefully remove packing material from equipment and save it for repacking. Check that power cable is supplied with test set.

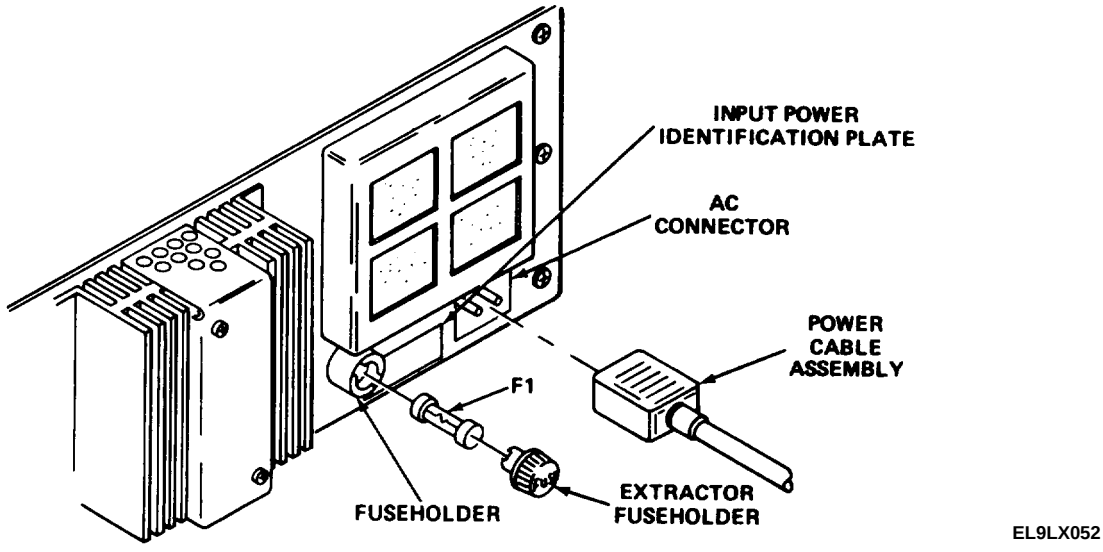
Inspect case for scratches, dents, or any other signs of damage that may have occurred during storage or shipment.

3-3. UNPACKING AND INSPECTION. (CONT)



Inspect front panel for missing or broken switch actuating lenses. Make sure support bail is not bent or broken and can support the test set as intended.

3-4. PRELIMINARY SERVICING AND ADJUSTMENT.



3-4. PRELIMINARY SERVICING AND ADJUSTMENT. (CONT)

Test set is shipped from factory wired for 115 vat, 50/60 Hz operation. The input power identification plate, located on the back of test set, should state this.

Test set can operate on 230 vac, 50/60 Hz input power when input wiring is changed. This is done at next higher level of maintenance.

Plug power cable assembly into ac connector.

CAUTION

Before plugging power cable assembly into standard 115 vac outlet, make sure POWER switch is in OFF position and check fuse F1 for correct rating for selected operating voltage. To check fuse, do the following:

1. Press in on extractor fuse holder and rotate counterclockwise to unlock.
2. Pull extractor fuse holder and fuse F1 out of fuse holder.
3. Remove fuse F1 and inspect for correct rating.

NOTE

For 115 vac operation, fuse F1 must be rated at 4 amp, 120 v.

For 230 vac operation, fuse F1 must be rated at 2 amp, 250 v.

4. Install correct fuse F1 in extractor fuse holder.
5. insert fuse F1 and extractor fuse holder in fuse holder.
6. Push in on extractor fuse holder and rotate in a clockwise direction to lock in place.

Section Ill ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-5. GENERAL.

To keep test set in proper operating condition, the following checks must be performed:

1. inspect test set for scratches and worn or bare spots.
2. Clean test set on a routine basis or whenever cleaning becomes necessary (para 3-8).
3. Check for frayed cables, loose, missing, or damaged parts.

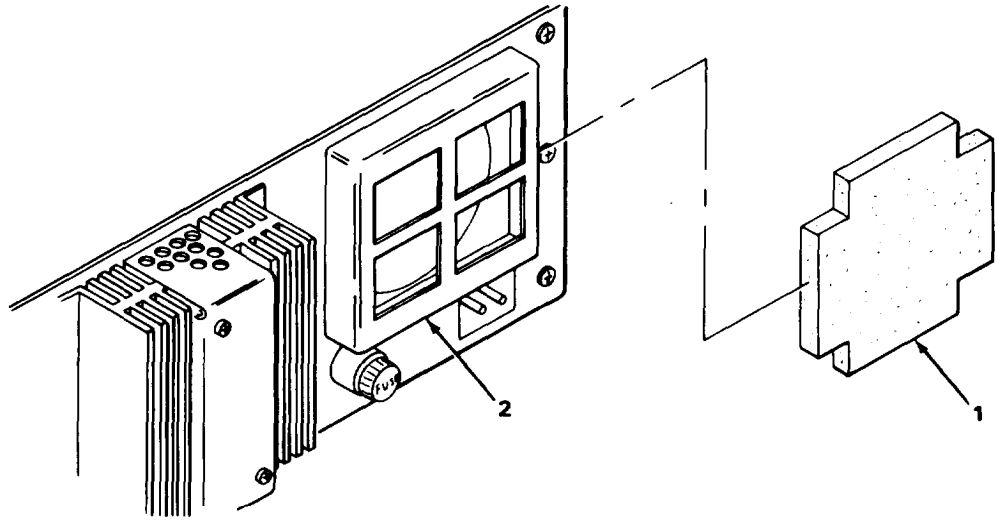
3-6. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

ORGANIZATIONAL PMCS, MONTHLY SCHEDULE

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
1	Blower Filter	Inspect for cleanliness. If necessary, clean (para 3-7).
2	Test Set	Perform operational check (para 3-9).

3-7. BLOWER FILTER CLEANING.

MATERIALS/PARTS: Detergent, G.P. liquid (item 5, appendix E)



EL9LX053

1. Slide filter (1) out of filter cage (2) on rear of test set.
2. Using mild detergent in water, thoroughly wash filter and rinse in clear water.

WARNING

In following step, do not use extremely hot air to dry filter. Damage to filter could result.

Compressed air shall not be used for cleaning purposes except where reduced to less than 29 psi and then only with effective chip guarding and personnel protective equip ment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used. Compressed air is dangerous and can cause serious bodily harm if protec- tive means or methods are not observed to prevent chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel.

3. Airdry filter.
4. Slide filter (1) in filter cage (2).

3-8. CLEANING AND TOUCHUP PAINTING.

MATERIALS/PARTS: Lint-free cloth (item 1, appendix E)
Trichlorotrifluoroethane (item 2, appendix E)
Cleaning cloth (item 6, appendix E)

WARNING

TRICHLOROTRIFLUOROETHANE

Fumes of TRICHLOROTRIFLUOROETHANE are poisonous. Provide adequate ventilation whenever you use TRICHLOROTRIFLUOROETHANE. Do not use solvent near heat or open flame. TRICHLOROTRIFLUOROETHANE will not burn, but heat changes the gas into poisonous, irritating fumes. DO NOT breathe the fumes or vapors. TRICHLOROTRI-FLUOROETHANE dissolves natural skin oils. DO NOT get the solvent on your skin. Use gloves, sleeves and an apron which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

1. Inspect exterior of test set. It should be free of dust, dirt, grease, and fungus.
2. Remove dust and loose dirt with a clean, soft cloth.
3. Use a cloth dampened (not wet) with TRICHLOROTRIFLUOROETHANE to remove grease, fungus, and ground-in dirt.
4. Remove dust or dirt from power cable assembly and connectors with a soft brush. Remove grease or grime with a lint-free cloth moistened with TRICHLOROTRIFLUOROETHANE.
5. Clean test set front panel with a soft, clean, lint-free cloth.

Section IV ORGANIZATIONAL MAINTENANCE PROCEDURES

3-9. OPERATIONAL CHECK.

The performance of test set is tested during operational check of equipment. If a malfunction is found during a step in operational check, operator will either be referred to applicable repair or replacement procedure, or will be instructed to refer test set to a higher level of maintenance.

NOTE

After a repair or replacement procedure is done, the operational check is once again performed. If check fails, equipment is referred to a higher level of maintenance. If check passes, the next step in operational check is performed and the procedure is repeated.

No special tools or test equipment are required to perform these procedures.

3-9. OPERATIONAL CHECK. (CONT)

INITIAL SETUP

Perform self-test operation (para 2-3, steps 1 through 5),

OPERATIONAL CHECK PROCEDURE

The following table gives the operational check procedures or minimum performance test for test set. Perform each step in action column. Next, see the indication column for the expected response. The indication column also refers the operator to the appropriate repair or replacement procedure.

ACTION	INDICATION
1. Set rf output level to -50 dB mW and sequentially select frequencies of 74.60,75.00, and 75.40 MHz.	Test set display status should be as follows for each selected frequency: DISPLAY — INDICATION RDL/DDM/MOD — 95.0 MOD (%) AUDIO STATUS — STANDARD FREQUENCY — (frequency selected) MHz MODE — MB RF LEVEL — -50 dB mW RF STATUS — PH LOCK, LEVEL CAL TONE SELECT — 400 Hz FUNCTION/ CONTROL — No keys lit DATA ENTRY — No keys lit RF SELECT — RF FREQ key lit If display status is not indicated. as shown above, refer test set to higher level of maintenance.
2. Press 1300 Hz key.	1300 Hz key lamp should light. If not, see para 3-11.400 Hz key lamp should go out. If not, refer test set to higher level of maintenance.
3. Press 3000 Hz key.	3000 Hz key lamp should light. If not, see para 3-11.1300 Hz key lamp should go out. If not, refer test set to higher level of maintenance.
4. Sequentially press 30 Hz VAR, 9960 FM, 9960 Hz, 1020 Hz, 90 Hz, and 150 Hz keys.	No changes should occur on front panel. If any change occurs, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
5. Sequentially select and enter VOR rf carrier frequencies of 108.00, 113.70, and 117.95 MHz.	Test set display status should be as follows for each selected frequency: DISPLAY — INDICATION RDL/DDM/MOD — FROM, 000.00 RDL (DEG) AUDIO STATUS — STANDARD FREQUENCY — (frequency selected) MHz MODE — VOR RF LEVEL — -50 dB mW RF STATUS — PH LOCK, LEVEL CAL TONE SELECT — 30 Hz VAR, 9960 FM FUNCTION/ CONTROL — No keys lit DATA ENTRY — No keys lit RF SELECT — RF FREQ key lit If display status is not indicated as shown above, refer test set to higher level of maintenance.
6. Press 9960 FM key.	9960 FM key lamp turns off. If not, refer test set to higher level of maintenance.
7. Press 1020 Hz key.	1020 Hz lamp lights. If not, see para 3-11.
8. Sequentially press 90 Hz, 150 Hz, 400 Hz, 1300 Hz and 3000 Hz keys.	No changes should occur on front panel. If any change occurs, refer test set to higher level of maintenance.
9. Enter frequency of 108.00 MHz.	FREQUENCY display indicates 108.000 and MHz indicator lights. If either or both indications do not occur as described, refer test set to higher level of maintenance.
10. Press T/F U/L D/R key.	FROM indicator turns off and TO indicator turns on. If not, refer test set to higher level of maintenance.
11. Press STD key.	TO indicator turns off and FROM indicator turns on. If not, refer test set to higher level of maintenance.
12. Press STEP Δ RDL Δ DDM key.	RDL/DDM/MOD display should indicate 030.00. if not, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
13. Press + 10° STEP key.	RDL/DDM/MOD display should indicate 040.00. If not, refer test set to higher level of maintenance.
14. Press -10° STEP key.	RDL/DDM/MOD display should indicate 030.00. If not, refer test set to higher level of maintenance.
15. Press and hold + key.	RDL/DDM/MOD display should show a continuous increase. If not, refer test set to higher level of maintenance.
16. Release + key.	
17. Press and hold + key.	RDL/DDM/MOD display should show a continuous decrease. If not, refer test set to higher level of maintenance.
18. Release + key.	
19. Press **RDL/DDM** key.	RDL/DDM key lamp should light. If not, see para 3-11.
20. Enter 123.45 on DATA ENTRY keys.	
21. Press ENTER key.	RDL/DDM/MOD display should indicate 123.45 and RDL (DEG) indicator should light. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
22. Press STD key.	RDL/DDM/MOD display should indicate 000.00. If not, refer test set to higher level of maintenance.
23. Sequentially select and enter LOC rf carrier frequencies of 108.10, 110.10, and 111.95 MHz.	Test set display status should be as follows: DISPLAY — INDICATION RDL/DDM/MOD — U/L(150 Hz), .000 DDM AUDIO STATUS — STANDARD FREQUENCY — (Frequency selected) MHz MODE — LOC RF LEVEL — -50 dB mW RF STATUS — PH LOCK, LEVEL CAL TONE SELECT — 90 Hz, 150 Hz

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
	DISPLAY **INDICATION** FUNCTION/ CONTROL No keys lit DATA ENTRY No keys lit RF SELECT RF FREQ key lit if display status is not indicated as shown above, refer test set to higher level of maintenance.
24. Press 1020 Hz key.	1020 Hz key lamp should light. if not, see para 3-11.
25. Sequentially press 30 Hz VAR, 9960 FM, 9960 Hz, 400 Hz, 1300 Hz, and 3000 Hz keys.	No changes should occur on front panel. if any change occurs, refer test set to higher level of maintenance.
26. Press 1020 Hz key.	1020 Hz key lamp should go off. if not, refer test set to higher level of maintenance.
27. Press % MOD key.	% MOD key lamp should light. if not, see para 3-11. RF FREQ key lamp should go off. If not, refer test set to higher level of maintenance. RDL/DDM/MOD display should indicate 20.0. if not, refer test set to higher level of maintenance. AUDIO STATUS display VAR % MOD indicator should light. if not, refer test set to higher level of maintenance.
28. Enter 44.4 percent modulation.	RDL/DDM/MOD display should flash on and off. if not, refer test set to higher level of maintenance.
29. Press CLEAR key.	RDL/DDM/MOD display should stop flashing.
30. Enter 26.9 percent modulation.	RDL/DDM/MOD display should indicate 26.9. if not, refer test set to higher level of maintenance.
31. Press STD key.	STANDARD indicator key should light and RDL/DDM/MOD display should indicate .000. if not, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
32. Press Δ ILS PH key.	Δ ILS PH key lamp should light. If not, refer to 3-11.
33. Sequentially select and enter GS rf carrier frequencies of 329.15, 332.15, and 335.00 MHz.	Test set display status should be as follows for each selected frequency: DISPLAY — INDICATION RDL/DDM/MOD — U/L(150 Hz), .000 DDM AUDIO STATUS — STANDARD FREQUENCY — (frequency selected) MHz MODE — GS RF LEVEL — -50 dB mW RF STATUS — PH LOCK, LEVEL CAL TONE SELECT — 90 Hz, 150 Hz FUNCTION/ CONTROL — No keys lit DATA ENTRY — No keys lit RF SELECT — RF FREQ key lit If display status is not indicated as shown above, refer test set to higher level of maintenance.
34. Sequentially press 1020 Hz, 30 Hz VAR, 9960 FM, 9980 Hz, 400 Hz, 1300 Hz, and 3000 Hz keys.	No changes should occur on front panel. If any change occurs, refer test set to higher level of maintenance.
35. Enter LOC rf carrier frequency of 108.10 MHz.	FREQUENCY display should read 108.10. If not, refer test set to higher level of maintenance.
38. Press LOC/GS key.	FREQUENCY display should read 334.700 (paired GS frequency). If not, refer test set to higher level of maintenance.
37. Enter LOC rf carrier frequency of 110.10 MHz.	FREQUENCY display should read 110.100. If not, refer test set to higher level of maintenance.
38. Press LOC/GS key.	FREQUENCY display should read 334.400 (paired GS frequency). If not, refer test set to higher level of maintenance.
39. Enter LOC rf carrier frequency of 111.95 MHz.	FREQUENCY display should read 111.950. If not, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
40. Press LOC/GS key.	FREQUENCY display should read 330.950 (paired GS frequency). If not, refer test set to higher level of maintenance.
41. Enter a frequency of 106.10 MHz.	FREQUENCY display should read 108.100. If not, refer test set to higher level of maintenance.
NOTE The next step should cause RDL/DDM/MOD display to sequentially display readings of .046, .093,.155, and .200.	
42. Repeatedly press STEP Δ RDL Δ DDM key.	RDL/DDM/MOD display should sequentially read .046, .093, .155, and .200. If not, refer test set to higher level of maintenance.
43. Press and hold + key.	RDL/DDM/MOD display should show a continuous decrease. If not, refer test set to higher level of maintenance.
44. Release + key.	
45. Press and hold + key.	RDL/DDM/MOD display should show a continuous increase. If not, refer test set to higher level of maintenance.
46. Release + key.	
47. Press RDL/DDM key.	RDL/DDM key lamp should light. If not, see para 3-11.
48. Using DATA ENTRY keys, enter .400.	
49. Press ENTER key.	RDL/DDM/MOD display should read .400. If not, refer test set to higher level of maintenance.
50. Press T/F U/L D/R key.	U/L (150 Hz) indicator should go off and D/R (90 Hz) indicator should light. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
51. Press STD key.	D/R (90 Hz) indicator should turn off and U/L (150 Hz) indicator should turn on. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
52. Enter a frequency of 335.00 MHz.	FREQUENCY display should read 335.000. If not, refer test set to higher level of maintenance.
NOTE The following step should cause RDL/DDM/MOD display to sequentially display .045, .091, .175, and .400.	
53. Repeatedly press STEP Δ RDL A DDM key.	RDL/DDM/MOD display should sequentially read .045, .091, .175, and .400. If not, refer test set to higher level of maintenance.
54. Press and hold − key.	RDL/DDM/MOD display should show a continuous decrease. If not, refer test set to higher level of maintenance.
55. Release − key.	
56. Press and hold + key.	RDL/DDM/MOD display should show a continuous increase. If not, refer test set to higher level of maintenance.
57. Release + key.	
58. Press RDL/DDM key.	RDL/DDM key lamp should light. If not, see para 3-11.
59. Enter .800 on DATA ENTRY keys.	
60. Press ENTER key.	RDL/DDM/MOD display should read .800. If not, refer test set to higher level of maintenance.
61. Press T/F U/L D/R key.	U/L (150 Hz) indicator should go off and D/R (90 Hz) indicator should light. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
62. Press STD key.	D/R (90 Hz) indicator should go off and U/L (150 Hz) indicator should light. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.

3-9. OPERATIONAL CHECK (CONT)

ACTION	INDICATION
63. Enter a frequency of 108.000 MHz.	FREQUENCY display should read 108.000. If not, refer test set to higher level of maintenance.
64. Press 30 Hz VAR key.	30 Hz VAR key lamp should go out. If not, refer test set to higher level of maintenance.
65. Press 9960 FM key.	9960 FM key lamp should go out. If not, refer test set to higher level of maintenance.
66. Set rf output level to -6 dB mW.	RF LEVEL display should read 6 and -dB mW indicator should be lit. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
67. Press Δ F key.	Δ F key should light. If not, see para 3-11. FREQUENCY display should read between 07990.0 and 08010.0. If not, refer test set to higher level of maintenance.
68. Press and hold SLOW DECR key.	FREQUENCY display should show a continuous decrease. If not, refer test set to higher level of maintenance.
69. Release SLOW DECR key.	
70. Press and hold SLOW INCR key.	FREQUENCY display should show a continuous increase. If not, refer test set to higher level of maintenance.
71. Release SLOW INCR key.	
72. Press and hold FAST DECR key until FREQUENCY display stops decreasing.	FREQUENCY display should show a continuous decrease and a final reading less than 07973 kHz. If either or both indications do not occur as described, refer test set to higher level of maintenance.
73. Press and hold FAST INCR key until FREQUENCY display stops Increasing.	FREQUENCY display should show a continuous Increase and a final reading greater than 08027 kHz. If either or both indications do not occur as described, refer test set to higher level of maintenance.

3.9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
74. Enter a frequency of 75.000 MHz.	FREQUENCY display should read 75.000. If not, refer test set to higher level of maintenance.
NOTE If 400 Hz key is lit, press to extinguish.	
75. Set rf output level to -50 dB mW.	RF LEVEL display should read 50 and -dB mW indicator should be lit. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
76. Press dB mW/µV key.	RF LEVEL display should read 700 and the µV indicator should be lit. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
77. Press dB mW/µV key again.	RF LEVEL display should read 50 and -dB mW indicator should be lit. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
78. Press and hold SLOW DECR key.	RF LEVEL display should show a continuous increase in 1 db increments. If not, refer test set to higher level of maintenance.
79. Release SLOW DECR key.	
80. Press and hold SLOW INCR key.	RF LEVEL display should show a continuous decrease in 1 db increments. If not, refer test set to higher level of maintenance.
81. Release SLOW INCR key.	
82. Press and hold FAST DECR key.	RF LEVEL display should show a continuous increase in 10 db increments. If not, refer test set to higher level of maintenance.
83. Release FAST DECR key.	

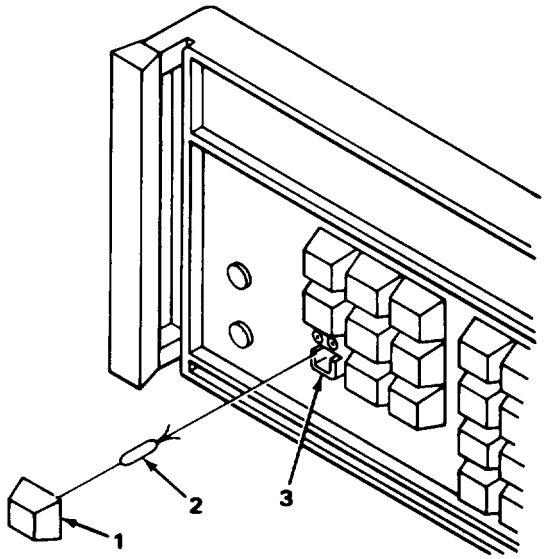
3-9. OPERATIONAL CHECK. (CONT)

ACTION	INDICATION
84. Press and hold FAST INCR key.	RF LEVEL display should show a continuous decrease in 10 db increments. if not, refer test set to higher level of maintenance.
85. Release FAST INCR key.	
86. Set rf output level to -6 dB mW.	RF LEVEL display should read 6 and -dB mW indicator should be lit. If either or both of these indications do not occur as described, refer test set to higher level of maintenance.
87. Press and hold RF ON/OFF key until RF LEVEL display reads OFF.	Test set display status should be as follows: **DISPLAY** — **INDICATION** F R E Q U E N C Y — - - - RF LEVEL — OFF RF STATUS — PH LOCK, LEVEL CAL indicators off If display status is not indicated as shown above, refer test set to higher level of maintenance.
88. Press and hold RF ON/OFF key until RF LEVEL display reads 6.	Test set display status should be as follows: **DISPLAY** — **INDICATION** FREQUENCY — 75.000 RF LEVEL — 6 RF STATUS — PH LOCK, LEVEL CAL indicators lit

3-10. REPAIR OR REPLACEMENT.

Organizational level maintenance of test set is limited to replacement of incandescent lamps, fuses, power cable assembly and switch actuating lenses. The following paragraphs contain removal and installation procedures for these items.

3-11. INCANDESCENT LAMPS/SWITCH ACTUATING LENS REPLACEMENT.



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TOOLS: Electrical Extractor

REMOVAL

1. Remove switch actuating lens (1) with extraction tool.
2. Remove light bulb (2) by pulling straight out of switch receptacle (3) with tweezers. Do not discard light bulb, until new bulb has been installed.

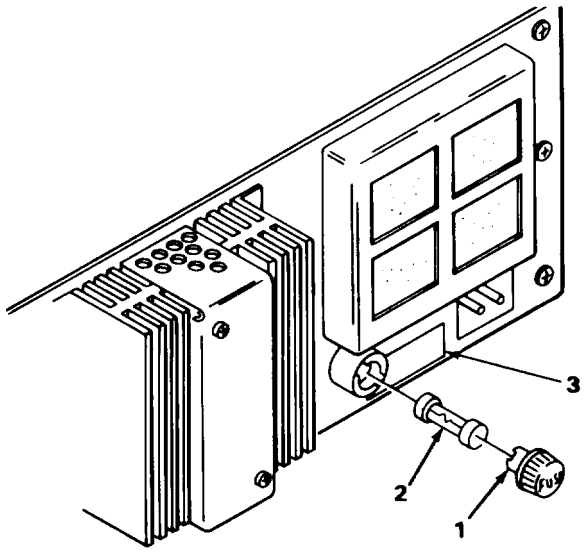
INSTALLATION

NOTE

For next step, refer to light bulb removed in step 2 above,

1. Cut and bend leads on replacement light bulb to same dimensions and same bends as old light bulb.
2. Press light bulb (2) into switch receptacle (3).
3. Press switch actuating lens (1) into position on front panel until snapped into place.

3-12. FUSE REPLACEMENT.



EL9LX056

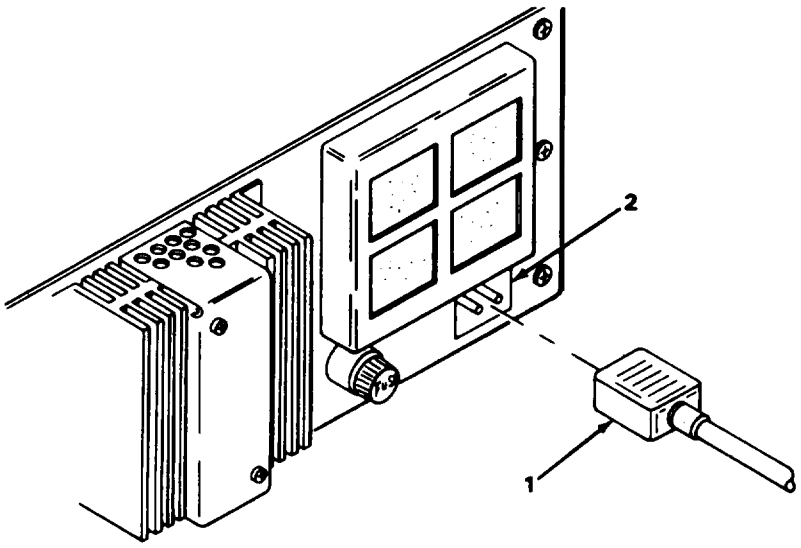
REMOVAL

1. Press in on extractor fuse holder (1) and rotate counterclockwise to unlock.
2. Pull extractor fuse holder (1) and fuse F1 (2) out of fuse holder (3).
3. Discard bad fuse.

INSTALLATION

1. Install replacement fuse F1 (2) in extractor fuse holder (l).
2. Insert fuse F1 (2) and extractor fuse holder (1) into fuse holder (3).
3. Push in on extractor fuse holder (1) and rotate in a clockwise direction until locked in place.

3-13. POWER CABLE ASSEMBLY REPLACEMENT.



EL9Lx057

REMOVAL

1. Remove power cable assembly (1) from ac connector (2) by pulling straight out.
2. If repairable, set power cable assembly (1) aside. If not repairable, discard.

INSTALLATION

1. Correctly position power cable assembly (1) over ac connector (2).
2. Press power cable assembly (1) into ac connector (2).

Section V PREPARATION FOR STORAGE OR SHIPMENT

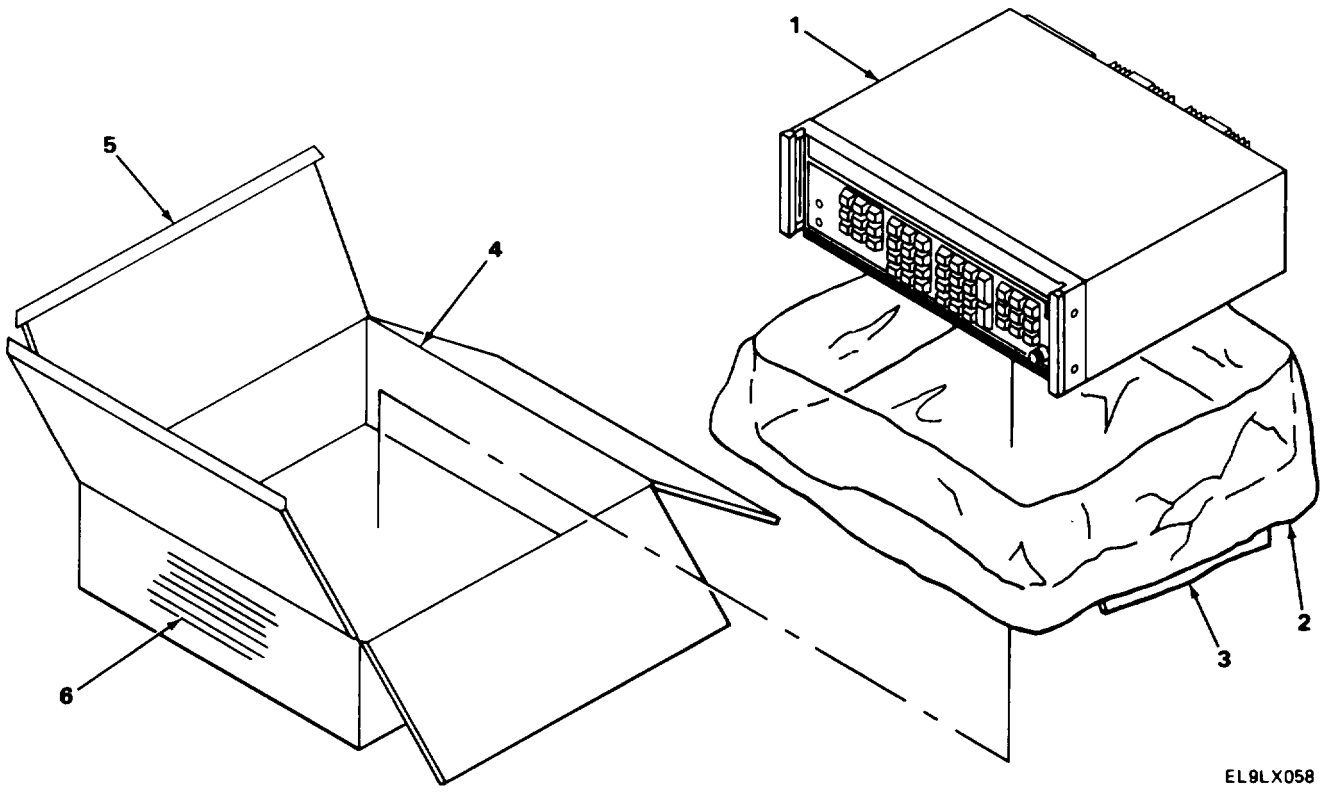
3-14. GENERAL.

This section provides procedures for repacking test set. Before repacking, the next scheduled PMCS should be performed. All known problems should be corrected and all current Modification Work Orders (MWO's) applied.

3-15. ADMINISTRATIVE STORAGE.

Administrative storage refers to storage from 1 to 45 days.

MATERIALS/PARTS: Double thick cardboard box
Tape
One heavy plastic bag



PACKING

1. Encase test set (1) in heavy plastic bag (2).
2. Close with tape (3) to seal against moisture.
3. Pack test set in double thickness cardboard box (4).
4. Seal box (4) with tape (5).
5. Mark box with appropriate nomenclature (6), model identification and serial number of test set.
6. Place box in secure storage area.

3-16. INTERMEDIATE STORAGE.

Intermediate storage refers to storage between 46 and 180 days.

Test set is packed in the same manner as for administrative storage (para 3-15).

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referred to in this manual.

A-2. FORMS.

Recommended Changes to Publications and Blank Forms . . . . . DA Form 2028
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Discrepancy in Shipment Report (DISREP) SF-361
Report of Discrepancy (ROD) SF-364
Quality Deficiency Report SF-368

A-3. MANUALS.

Reporting of Transportation Discrepancies in Shipment . . . . . AR 55-38
Reporting of Item and Packaging Discrepancies . . . . . AR 735-11-2
Consolidated Index of Army publications and Blank Forms . . . . . DA PAM 310-1
The Army Maintenance Management System (TAMES) . . . . . DA PAM 738-750
Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for Test Set, Receiver AN/ARM-180 (NSN 6625-01-041-4161) . . . . . TM 11-6625-2975-24P
Administrative Storage of Equipment . . . . . TM 740-90-1
Procedure for Destruction of Electronics Materiel To Prevent Enemy Use (Electronics Command) . . . . . TM 750-244-2

APPENDIX B

MAINTENANCE ALLOCATION

Section I INTRODUCTION

B-1. GENERAL.

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

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

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

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

c. Service. Operations required periodically to keep an item in proper operating condition, ie, to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or compressed air suppiles.

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

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

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

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

h. Replace. The act of substituting a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

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

B-2. MAINTENANCE FUNCTIONS. (CONT)

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

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

B-3. COLUMN ENTRIES.

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

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical fleid operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

c - Operator/Crew
o - Organizational
F - Direct Support
H - General Support
D - Depot

B-3. COLUMN ENTRIES. (CONT)

e. Column 5, Tools and Equipment. Column 5 specifies by code those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. TOOL AND TEST EQUIPMENT REQUIREMENTS.

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance categories allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the federal supply code for manufacturers (5-digit) in parentheses.

B-5. REMARKS.

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items in section Il.

Section II MAINTENANCE ALLOCATION CHART FOR AN/ARM-180

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
00	TEST SET, RECEIVER AN/ARM-180	Inspect		0.2					
		Test		0.1					
		Test				1.0		1-3, 9-14,18	
		Test					1.0		E
		Adjust				7.0		2,3,8, 10,11, 13,15, 17,	A
		Calibrate				4.0		18	B
		Repair		0.5				19	C
		Repair				1.0		1-16	D
		Repair					7.0		E
01	FRONT PANEL ASSEMBLY A1	Inspect		0.1				1	
		Test					0.5		E
		Replace				0.2		1	
		Repair					1.5		E
		Repair		0.5				19	C
		Repair				0.9			F
02	CONTROLLER AUDIO ASSEMBLY A2	Test					0.9		E
		Replace				0.4		1	
		Repair					2.5		E
03	RF MODULATOR ASSEMBLY A3	Test					1.0		E
		Replace				0.4		1	
		Repair					2.5		E
04	SYNTHESIZER ASSEMBLY A4	Test					0.7		E
		Replace				0.4		1	
		Repair					2.0		E
05	POWER SUPPLY ASSEMBLY A5	Test					0.2		E
		Replace				0.3		1	
		Repair					1.0		E
06	CHASSIS ASSEMBLY A6	Test				0.2			
		Replace				0.3		1	
		Repair				1.0			

Section III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR AN/ARM-180

TOOLS OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,H	TOOL KIT, CALIBRATION TECH	5180-00-670-7123	
2	H	FREQUENCY COUNTER HP 5345A	4935-01-035-9167	
3	H	METER, POWER HP 435A WITH THERMOSTAT MOUNT	6625-00-148-8069 6625-01-144-2747	
4	H,D	3 DB ATTENUATOR WEINSCHEL 1A-3		
5	H,D	ATTENUATOR, VARIABLES	5985-00-957-1860	
6	H,D	6 DB ATTENUATOR, WEINSCHEL 1A-6		
7	H,D	AMPLIFIER, RADIO	6625-00-424-5266	
8	H,D	SPECTRUM ANALYZER IP-1216 (P)/GR PL-1388/U PLUG-IN UNIT PL-1406/U PLUG-IN SPC	 6625-00-424-4370 6625-00-431-9339 6625-00-140-0156	
9	H	ANALYZER, DISTORTION	6625-00-411-4551	
10	H	VOLTMETER, DIGITAL	6625-00-557-8305	
11	H	DIFFERENTIAL VOLTMETER	4931-00-407-2642	
12	H,D	DECADE RESISTOR, WINDSLOW 336	6625-00-585-4915	
13	H	OSCILLOSCOPE TEK R5440	6625-01-086-5980	
14	H	ZIFOR (COLLINS MODEL 478A-3)	4931-01-106-8642	
15	H,D	PHASEMETER, DRANETZ 305/C305-PA-3001		
16	H,D	SIGNAL GENERATOR HP UDL8640B	6625-00-318-6304	

TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
AN/ARM-180 (CONT)

TOOLS OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
17	H,D	10 DB ATTENUATOR, FIXED WEINSCHEL 1A-10	5985-01-100-9769	
18	O,H,D	EXTENDER CABLE FOR MODULES 634-9049-001		
19	O,H	EXTRACTOR, ELECTRICAL	5999-01-084-6839	

Section IV. REMARKS

REFERENCE CODE	REMARKS
A	ADJUST RF OUTPUT, AUDIO TONES, AM MODULATION, POWER SUPPLY AND + 12 VDC REGULATOR ON A2A2.
B	SEE TB 9-6625-2076-35 SECTION II.
C	REPAIR BY REPLACEMENT OF LAMPS, POWER CABLE, LENSES, FUSE.
D	REPAIR BY REPLACEMENT OF MODULES.
E	ALL DEPOT REPAIR WILL BE PERFORMED BY AIR FORCE.
F	REPAIR BY REPLACEMENT OF LIMITED FRONT PANEL PIECE PARTS EXCEPT MODULES A1A1 AND A1A2.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS

Section I INTRODUCTION

C-I. SCOPE.

This appendix lists components of end item and basic issue items for the test set to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue Items List is divided into the following sections:

a. Section III, Components of End Item. This listing is for informational purposes only, and is not authorization to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section Ill, Basic Issue Items. These are the minimum essential items required to place the test set in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, Bll must be with the test set during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. The manual is your authority to request/requisition replacement Bll, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS.

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

a. Column (l), Illustration Number (Illus No.). This column indicates the number of the illustration in which the item is shown.

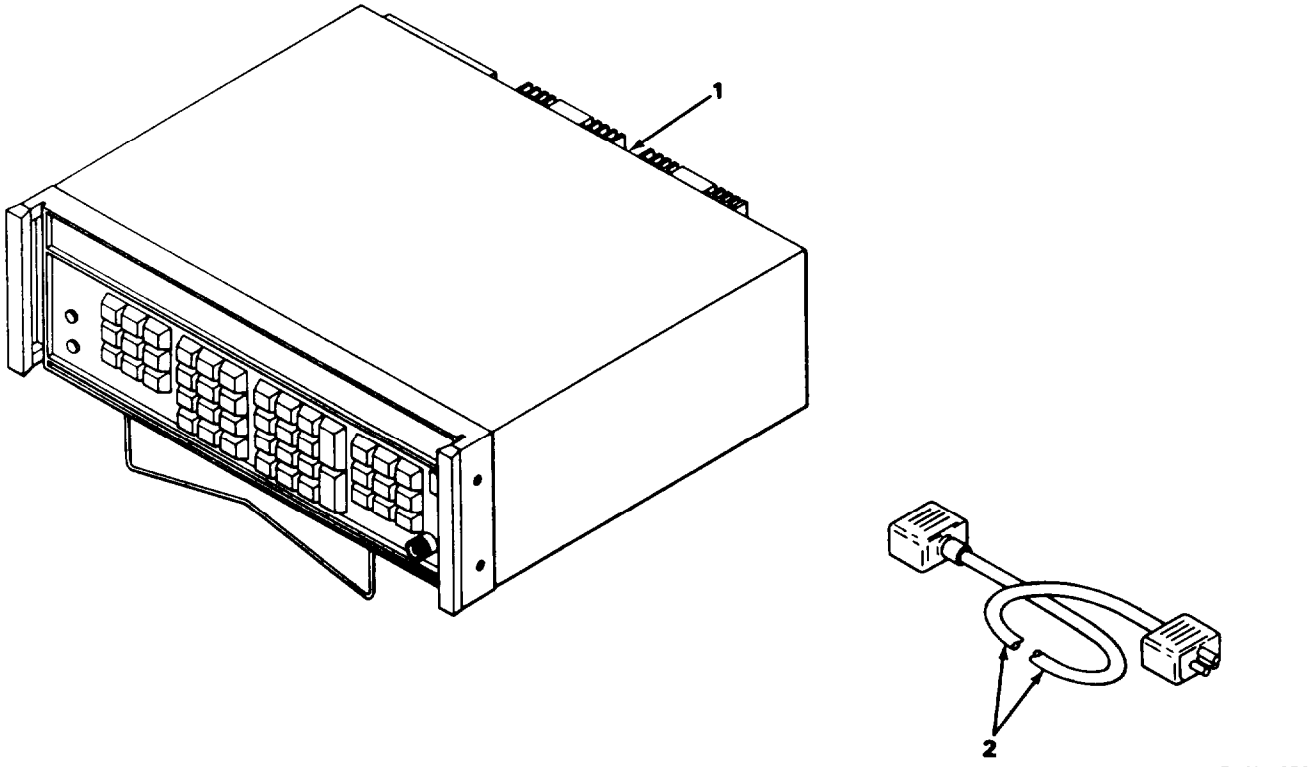
b. Column (2), National Stock Number. Indicates the national stock number assigned to the issue. The national stock numbers in section Ill will be used for requisitioning basic issue Items.

c. Column (3), Description. Indicates the national item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4), Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (eg, ea, in., pr).

e. Column (5), Quantity Required (Qty Req'd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II COMPONENTS OF END ITEM



(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQ'D
1	6625-01-041-4161	TEST SET, RECEIVER AN/ARM-180 (80058)		ea	1
2	6150-01-004-8773	CABLE ASSEMBLY, POWER (28480) 8120-1348		ea	1

Section III BASIC ISSUE ITEMS

There are no Basic Issue Items for the test set.

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I INTRODUCTION

D-1. SCOPE.

This appendix lists additional items you are authorized for the support of the test set.

D-2. GENERAL.

This list identifies items that do not have to accompany the test set and that do not have to be turned in with it. These items are all authorized to You by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items YOU require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (ie, CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
	CABLE, TEST (13499) 634-9094-001		ea	1
5999-01-084-6839	EXTRACTOR, ELECTRICAL (13499) 638-2280-001		ea	1

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

E-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the Test Set, Receiver AN/ARM-180. These items are authorized to you by CTA 50-970, Expendable Items (except medical, class V, repair parts, and heraldic items).

E-2. EXPLANATION OF COLUMNS.

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced In the narrative instructions to identify the material (eg, use cleaning compound, item 1, appendix C).

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational

c. Column 3, National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character abbreviation (eg, ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section III EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION (FSCM)	(5) U/M
1	O		LINT-FREE CLOTH	ea
2	O	6850-00-105-3084	CLEANING COMPOUND, FREON TR (TRICHLOROTRIFLUOROETHANE)	oz (16)
3	O		BRUSH MIL-G-721	
4	O	5350-00-598-5908	SANDPAPER, FINE, NO. 000	sh
5	O	7930-01-055-6121	DETERGENT, GENERAL	
6	O	8305-00-222-2424	CLEANING CLOTH CC-C-440E-81348	ea

GLOSSARY

Section I ABBREVIATIONS

ATTEN	attenuator
db	decibel
D/R	down/right
DDM	difference in depth of modula
GS	glideslope
Hz	hertz
ILS	instrument landing system
LOC	localizer
MHz	millihertz
MKR BCN (MB)	marker beacon
OC	on course
PWR	power
rf	radio frequency
T/F	to/from
U/L	up/left
VAR	variable
VHF	very high frequency
VOR	VHF omnirange

Section II DEFINITION OF UNUSUAL TERMS

Channel reject. Rejection of radio frequency by navigational equipment.

Omnirange. A radio facility providing bearing information to or from such facilities at all azimouths within its service area.

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