L3 CARRIER
PEARL TERMINAL ARRANGEMENTS
DESCRIPTION

CONTENTS PAGE

1. GENERAL

1.01 This section describes the access and interface equipment provided at L3 terminals for the KS-19895 PEARL test set and also includes a functional description of the PEARL test set.

1.02 The Performance Evaluation of Amplifiers at Remote Locations (PEARL) is provided by in-service coaxial line measurements of oscillators, which are frequency assigned to each repeating line amplifier and whose oscillator power, measured at terminal or switching main repeaters, may be used to evaluate each line amplifier.

1.03 Additional evaluation of L3 coaxial lines may be made by out-of-service measurements. These measurements are made by inserting a 4-MHz signal at a transmitting main repeater and measuring the modulation products at receiving terminals. These modulation products are a result of mixing 4 MHz and the oscillator assigned frequency that appears within each amplifier. Excessive modulation products appear when the amplifier is not operating properly.

2. KS-19895 PEARL TEST SET

A. General

2.01 The PEARL test set provides switch selection of each identification or modulation products frequency and provides measurement of power at each frequency. A 4-kHz internal oscillator provides power for out-of-service modulation products tests. The operation of the 4-kHz internal oscillator does not prohibit using the measuring set simultaneously.

2.02 The PEARL test set can be used as a portable instrument for measurement and adjustment at repeater locations or it can be installed as a bay-mounted instrument at switching and terminal main repeater stations.

2.03 At main repeater stations a J68830R patching panel holds the PEARL test set and jack field (see Fig. 1). Spaces are provided adjacent to each jack in the jack field for route identification. A short coaxial cord type P2DW or equivalent is used to patch the appropriate trunk to the test set.

2.04 The receiving access trunks appearing at the PEARL test set jack field provide access to each L3 receiving coaxial line. Each trunk input is provided a 30-dB pad to allow bridging measurements. The trunk output is terminated in 75 ohms when not in use. This termination is removed by insertion of a patch cord when the test equipment is required. This arrangement ensures that the bridged trunks are correctly terminated to reduce radiation, noise pickup, and crosstalk.

2.05 The transmitting access trunks appearing at the PEARL test set jack field do not require bridging pads and trunk terminations. Transmitting lines used for insertion of 4-kHz test signals require a spare transmitting hybrid for insertion; therefore, transmitting trunks are run from the PEARL jack field only to those transmitting bays containing spare transmitting hybrids.

2.06 Because of the concentration of coaxial lines appearing at the PEARL test set jack field, it may be convenient to use this access point for other in-service bridging measurements substituting other types of test measuring equipment for the PEARL test set.

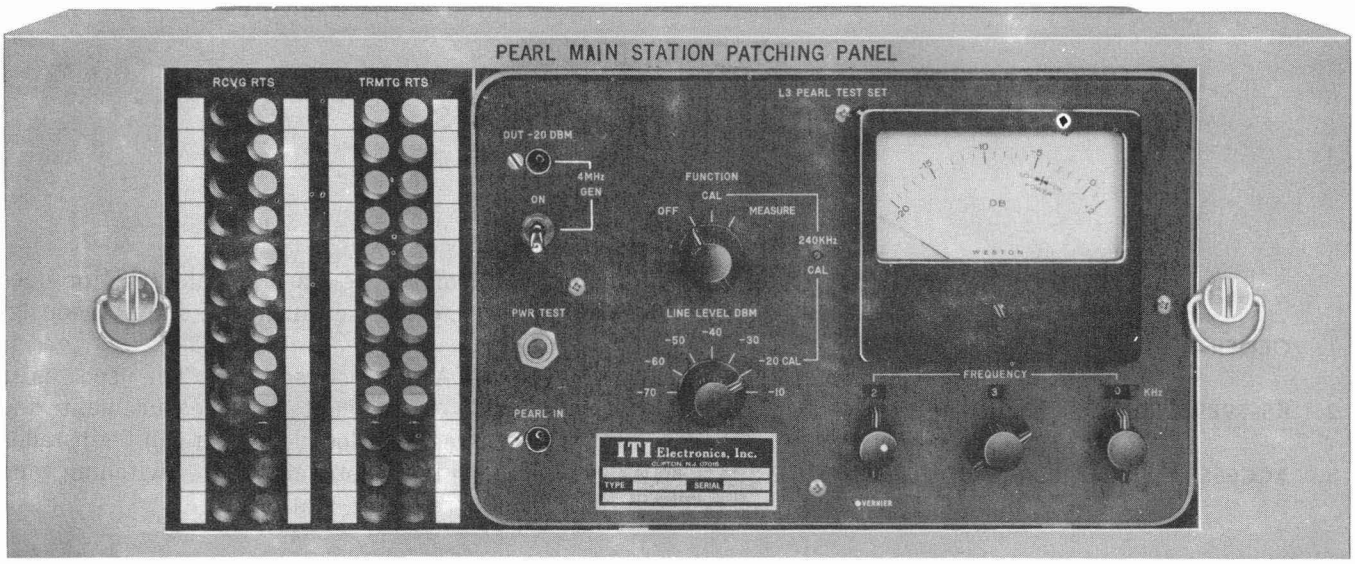

Fig. 1—J68830R PEARL Main Station Patching Panel

B. Description

2.07 The PEARL test set features discrete step tuning for each PEARL frequency. The frequency selection switches display the frequency being measured on dial windows. Three selection switches provide the required frequency information. Selection is in 1-kHz steps. The identification frequency of the amplifiers is measured from 210 to 259 kHz. The modulation products frequency is from 4210 to 4259 kHz.

2.08 A vernier control provides the fine frequency adjustment of the step tuning to increase the accuracy of the measurements of modulation products.

2.09 The PEARL test set measuring range is from -8 to -90 dBm. Attenuation in 10-dB steps is provided by a 7-position attenuation switch to provide coarse power measurement adjustment. The fine power measurement is displayed on a 4-1/2 inch dB power meter. The meter display range is -20 to +2 dB.

2.10 Since the bridge circuit is built into the receiving line trunks and not into the KS-19895 PEARL test set, if other power measuring equipment is used, the 30-dB attenuation presented at the access jacks must be compensated for when measuring at this jack field.

2.11 The 3-position switch labeled FUNCTION is used for measuring and calibrating the PEARL test set. When this switch is in the CAL position, the PEARL IN input jack is disconnected to prevent interference with the calibration procedure and a 240-kHz internal oscillator is powered. The frequency selection switches are positioned to this 240-kHz oscillator frequency and the LINE LEVEL DBM switch is set to the -20 CAL position. The test set is then calibrated by adjusting the 240 KHZ CAL control, if required, on the test set face.

2.12 An instruction book that accompanies the test set describes the means of calibration of the internal 240-kHz oscillator and the 4-MHz oscillator, which is used for modulation products testing.

2.13 When the FUNCTION switch is in the MEASURE position, the 240-kHz oscillator power is removed and the PEARL IN jack is connected to the measuring circuit. This is the normal operating position. When the FUNCTION switch is in the OFF position, power is removed from the test set and the power supplies (internal or external battery) are disconnected from the test set circuits.

2.14 The 4-MHz oscillator, which is used to transmit the modulation tone from which modulation products are obtained, is an electrically

independent circuit. When the FUNCTION switch is in any position except OFF, operation of the associated 4 MHZ GEN power switch is all that is required to place this circuit in operation. The output power is -20 dBm at the OUT -20DBM jack. This is the correct power for direct connection to the L3 spare transmitting hybrid.

2.15 The PEARL test set is designed to operate on either self-contained or office-battery power. The choice between office power and internal "D" cell battery power is made by appropriate connection of a bridging link in the test set. The test set, when built into the bay-mounted panel, is supplied power from the -24 volt office supply. The internal or external battery power can be readily monitored by depressing the PWR TEST pushbutton switch. A power calibration point on the meter is used to determine the adequacy of the battery.

3. ACCESS AND INTERFACE EQUIPMENT

3.01 A bay-mounted J68830R patching panel holds the PEARL test set and a jack field. The jack field provides the access and control interface between the test set and all repeatered L3 lines in the office. Some very large offices may exceed the capacity of the jack field. These offices have additional jack fields and, perhaps, additional PEARL test sets.

3.02 The receiving access circuit is composed of a trunk circuit and a line access circuit. The line access circuit consists of a field of 24 line access jacks marked RCVG RTS. One jack is provided for each trunk circuit. Spaces are provided adjacent to each jack for circuit identification. The appropriate trunk is patched to the test set with a short coaxial cord. The 540A jacks on the receiving trunks automatically provide 75-ohm termination to each trunk line when the patching plug is not inserted.

3.03 The various trunks are run from the RCVG RTS jack field to the receiving main repeater and appear in the repeater jack field in the mounting space just to the left of the PIL HY OUT A jack. The jack at the receiving main repeater end of the trunk is designated PEARL TRK IN. The 30-dB bridging pad is built into the trunk line at this jack location.

3.04 The PEARL TRK IN jack is located to the left of the normally unused portion of the PIL HY OUT A jack. A 372A coaxial patch plug is usually employed to patch from the PEARL TRK IN jack to the PIL HY OUT A jack. This patch plug will normally be left in place to provide the PEARL test set with a semipermanent access circuit to the L3 line signals, but the plug can be temporarily disconnected when it is desirable to use the hybrid jack for testing purposes other than PEARL measurements.

3.05 The transmitting PEARL 4-MHz patching access circuit consists of a jack field of 24 access jacks marked TRMTG RTS. The transmitting circuits are connected from the jack designated 4 MHZ GEN OUT -20DBM on the PEARL test set to the TRMTG RTS jack field on the J68830R patching panel using a P2DW patch cord or equivalent. Spaces are provided adjacent to each jack for spare transmitting circuit identification.

3.06 The transmitting trunks are run from the test set location to only those transmitting bays containing spare transmitting hybrids. Generally, spare hybrids are in every other transmitting bay. The trunk output jack is designated PEARL 4 MHZ OUT. This jack is normally not connected. When PEARL modulation tests are performed, a P2BJ cord is used to patch from the 4 MHZ OUT jack to the SP HY IN jack and the spare hybrid is patched into a particular FLAT AMP T IN jack from the SP HY OUT A jack.

3.07 The procedure for measuring L3 lines at terminal or switching main repeaters is described in Section 359-060-501.