L MULTIPLEX TERMINALS
COMMON EQUIPMENT
GROUP TRANSMISSION PILOT
J68857S AND -W 104.08-KHZ GROUP PILOT SUPPLIES
DESCRIPTION

CONTENTS PAGE

1. GENERAL

1.01 The J68857S and J68857W 104.08-kHz pilot supply circuits furnish group pilot signals for LMX-1 and LMX-2 terminal equipment. These circuits generate, amplitude stabilize, and distribute group pilot signals to the L multiplex transmitting terminals. Duplicate generators, with automatic switching from one to the other, provide protection of the group pilot signals.

1.02 ***Auxiliary frequency supply panel,*** top panel in Fig. 1, requires two 4-kHz input signals from a primary frequency supply and provides 100-kHz and 204-kHz output signals.

1.03 ***J68857S pilot generator unit,*** bottom panel in Fig. 1, generates the 104.08-kHz group pilot, primarily for LMX-2 equipment. This unit requires 100-kHz and 204-kHz input signals and provides three 104.08-kHz outputs. This unit includes two 104.08-kHz generators. A switching circuit automatically transfers the load to the standby generator upon failure of the regular generator.

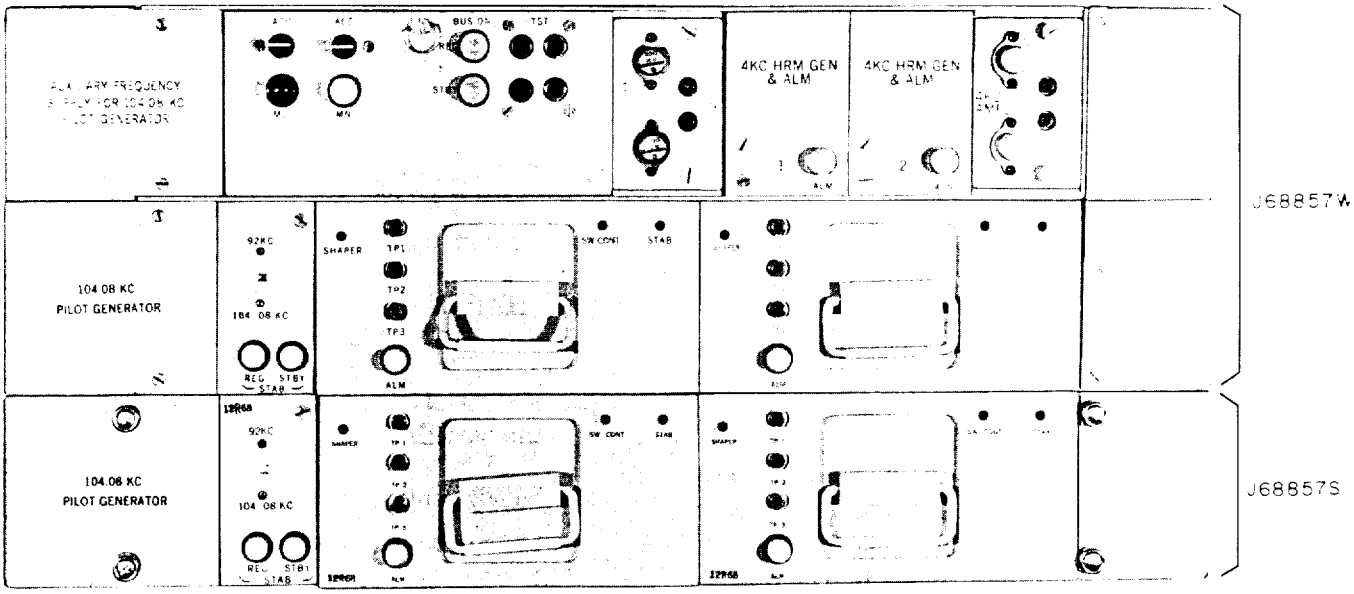

Fig. 1—104.08-kHz Pilot Supply Units

1.04 ***J68857W pilot supply*** consists of an auxiliary frequency supply panel and a J68857S pilot generator unit. This pilot supply is used for LMX-1 equipment and for combinations of LMX-1 and LMX-2 equipment.

2. CIRCUIT DESCRIPTION

2.01 The 104.08-kHz pilot supply circuit (SD-50379) is shown in block diagram form in Fig. 2. The group pilot frequency is produced from the accurate 4-kHz output of a primary frequency supply. Two identical circuits, designated regular and standby, produce stabilized 104.08-kHz signals. Either the regular or standby output is connected, via the stabilizer switch, to a primary distribution circuit which serves up to three secondary distribution circuits.

2.02 The 4-kHz input signal is amplified and applied to a harmonic generator that provides an output rich in the odd harmonics of 4 kHz. The 100-kHz and 204-kHz odd harmonics are selected by bandpass filters. A 4.08-kHz signal is obtained by dividing the 204-kHz signal in a counter circuit. The 4.08-kHz and 100-kHz signals are applied to a modulator and the desired 104.08-kHz output of the modulator is connected, via a pad and bandpass filter, to an amplitude-stabilizer circuit which provides a constant-level output. Stabilizer output level can be adjusted to the required value by an adjustable pad.

2.03 One stabilizer output is connected to the primary distribution circuit while the other stabilizer output serves as a standby source. Each stabilizer output connects to a switch control circuit which initiates switching to the standby if the regular output fails.

2.04 There are two types of primary distribution circuits:

(a) resistance networks with an adjustable input power and three 75-ohm outputs at a nominal power of −17 dBm each

(b) hybrid-transformer networks with a fixed input power and three 135-ohm outputs at a nominal power of −10 dBm each. This higher output power permits the use of individual level adjust controls at the input to each secondary distribution circuit and improves isolation.

The three outputs connect the group pilot power to secondary distribution circuits, each of which provides a sufficient number of output taps for connection to the group pilot insertion units in an L multiplex transmitting terminal. For all distribution circuits, unused taps are terminated in the appropriate resistance to maintain a constant load.

3. EQUIPMENT DESCRIPTION

3.01 The pilot supply circuits are solid-state and operate from −24 volt office battery. The panels are arranged for mounting in 19-inch racks.

3.02 The J68857S pilot generator unit includes two identical generators that are drawer-type plug-in modules. Each generator has a front-panel alarm lamp to indicate failure, test points for signal measurements, and controls for circuit adjustments. A plug-in printed wiring board contains the primary distribution bus, transfer switch, and alarm circuit which serve the two generators. The plug-in board has a status lamp to indicate which generator is supplying signal to the primary distribution circuit.

3.03 The auxiliary frequency supply panel contains two plug-in 4-kHz amplifiers and two harmonic generators. A pull-out assembly, connected to the main panel by a flexible local cable, includes the filters, test jacks, alarm relays, and indicator lamps. The front panel has status lamps to indicate which side is supplying output, alarm lamps to indicate failure in the regular or standby harmonic generator, lamps to indicate minor and major alarm conditions, switches for minor and major alarm cutoff, and test jacks for signal measurements.

3.04 Both generators of the J68857S pilot generator unit have front-panel indicators, controls, and test points as follows:

(a) SHAPER control for adjusting symmetry of the 204-kHz square wave

(b) SW CONT for adjusting amplifier gain in the stabilizer

(c) STAB control for adjusting stabilizer output to the desired power

(d) An amber ALM lamp which lights upon failure of the stabilizer output

(e) TP1 pin jack at which the 204-kHz shaper output signal appears

(f) TP2 and TP3 pin jacks at which the stabilizer switch control OR gate dc voltage appears.

3.05 A plug-in board common to both generators in the J68857S pilot generator unit has front-panel indicators and controls as follows:

(a) White REG and STBY STAB lamps to indicate which generator is providing signal to the primary distribution circuit

(b) 92 KC control for adjusting 92-kHz input power to the primary distribution circuit when both group pilot signals are transmitted

(c) 104.08 KC control for adjusting 104.08-kHz input power to resistive primary distribution circuit ***only.***

3.06 The auxiliary frequency supply panel has front-panel indicators, controls, and test points as follows:

(a) Red MJ lamp and associated ACO (alarm cut off) switch for major alarm circuit

(b) Amber MN lamp and associated ACO switch for minor alarm circuit

(c) White BUS ON REG and STBY lamps to indicate which generator is supplying signal to the primary distribution circuit.

(d) TST REG and STBY jacks, 135-ohm balanced, at which the 104.08-kHz signals from the stabilizer switch and alarm circuit appear at a nominal power of 0 dBm

(e) TST jacks, 135-ohm balanced, on both 4-kHz amplifiers

(f) Red ALM lamp on both 4-kHz harmonic generators.

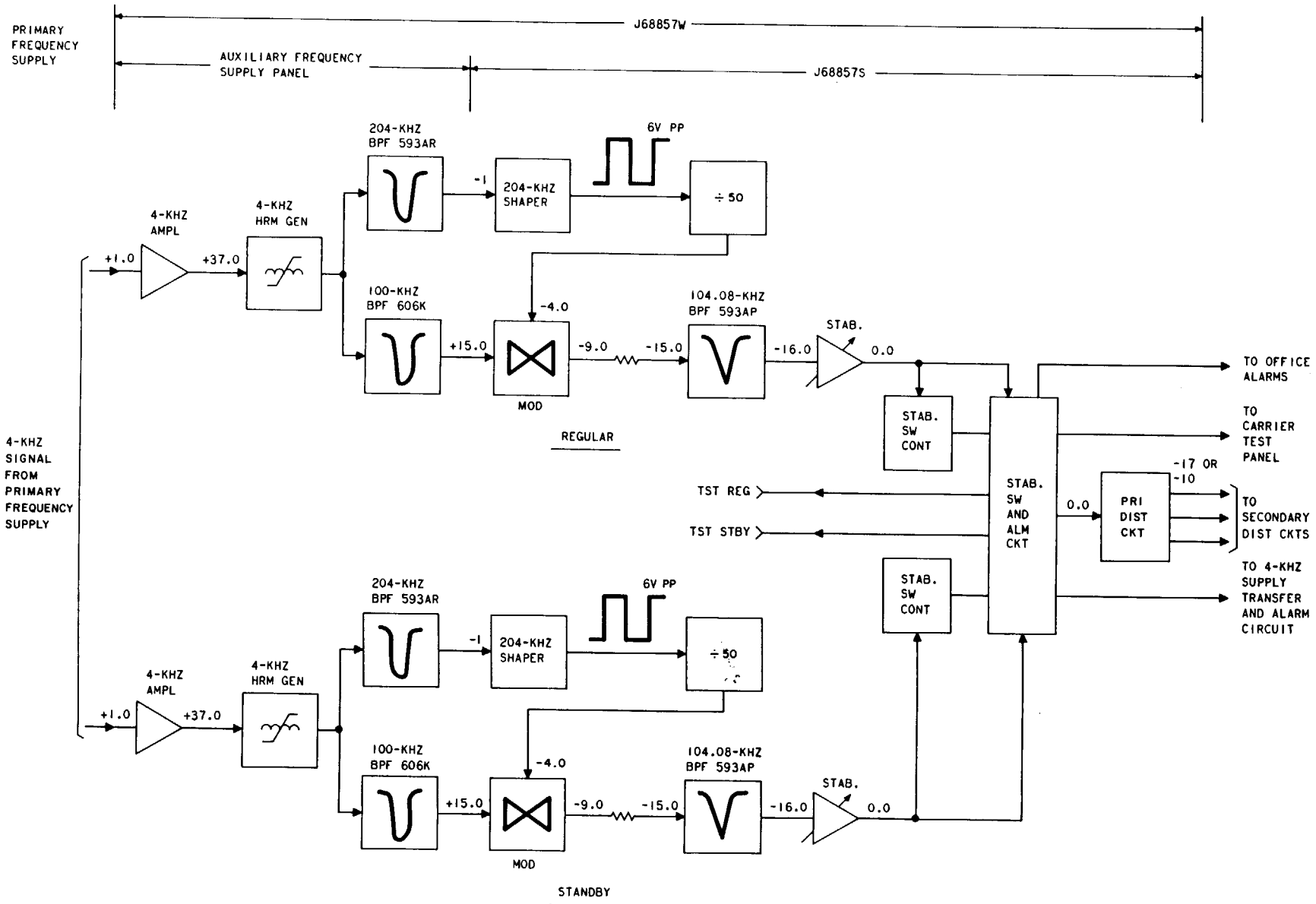

Fig. 2—104.08-kHz Pilot Supply Circuit