JERROLD

435-413.2

TRANSISTORIZED

LINE EXTENDER AMPLIFIER

MODEL TLE-1

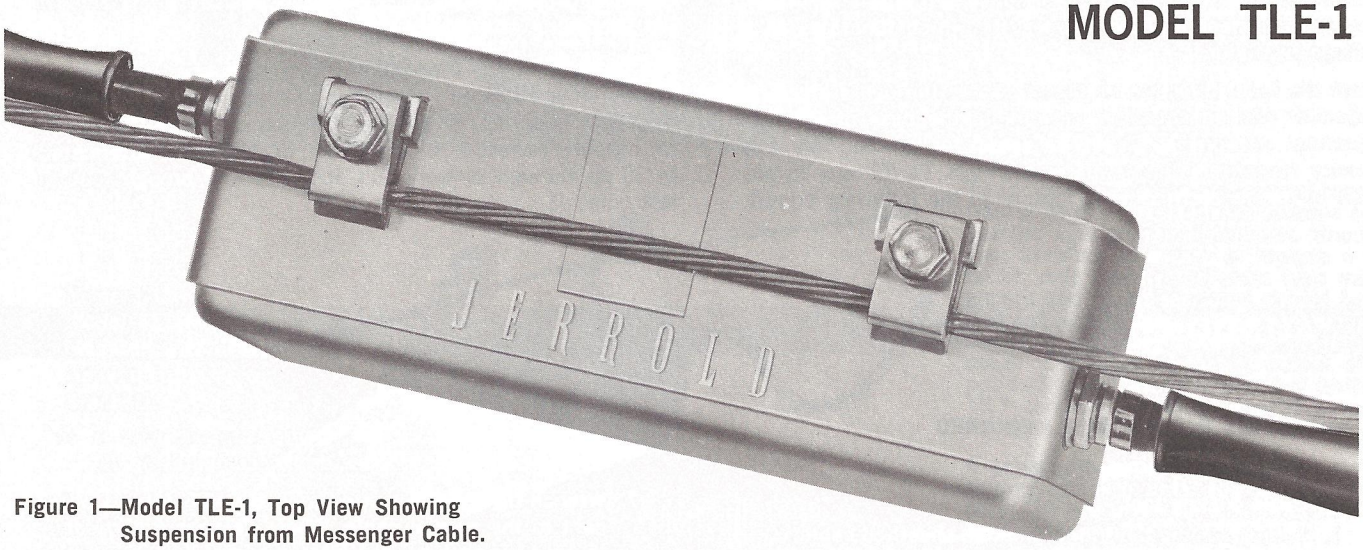


Figure 1—Model TLE-1, Top View Showing Suspension from Messenger Cable.

DESCRIPTION

Jerrold Model TLE-1 is a fully solid-state engineered, broadband line extension amplifier for use in community TV systems to provide clear pictures even at the end of an extended feeder run.

The amplifier is constructed as a completely enclosed plug-in unit, easily detachable from the housing for quick installation and servicing. It has externally adjustable and lockable gain and tilt controls, and an r.f. output test point.

The housing is of cast aluminum and equipped with built-on clamps for mounting the unit on messenger cable.* The coaxial chassis fittings usable with this housing will accept a variety of coaxial cable connector types including those used with aluminum cables.

Power requirements are a nominal 24 vac, 60 cps, obtained from a remote power supply (such as Jerrold Model 405-P or CPS-4). Both ac power and r.f. input signal for the amplifier are carried over the same coaxial cable. A built-in switch permits ac power to be passed on to cascaded units.

The solid-state design, printed circuitry, and built-in constant current/constant voltage regulation provide high reliability in performance. Low power drain assures economic operation and the use of corrosion-proof materials and stainless steel hardware give this line extender a long life even in adverse climatic environments.

*Where multi-cable installations make direct mounting on messenger impracticable, Jerrold can supply an Auxiliary Hanger Bracket Kit Model AHB-1 on special order.

SPECIFICATIONS

FREQUENCY RANGE	54 to 216 mc.
GAIN	18 db minimum at ch. 13.
FLATNESS OF RESPONSE	Within 1.5 db (aligned through 18 db of cable at ch. 13).
GAIN CONTROL RANGE	15 db reduction from full gain.
TILT CONTROL RANGE	5 db, from 18 db to 28 db of cable at ch. 13.
NOISE FIGURE	15 db maximum at ch. 13.
MAX. OUTPUT LEVEL (single unit)	33 dbmv per channel for 12 channels.
IMPEDANCE: INPUT	75 ohms at VSWR of 1.5:1 (14 db min. return loss).
OUTPUT	75 ohms at VSWR of 1.7:1 (12 db min. return loss).
POWER INPUT REQUIRED	20 to 30 vac at 200 ma max. (from remote power supply).
INTERNAL REGULATION	Constant current and constant voltage.
MOUNTING	On messenger cable.
INPUT & OUTPUT FITTINGS (to be ordered separately)	Coaxial, Jerrold Models VSF-404, VSF-408, VSF-412 or VSF-500, according to system requirements.**

**Accommodate flexible cable types JT-404 and JT-408, or aluminum type cables JT-1412 and JT-1500, or Xelon-jacketed types JT-1412J and JT-1500J (see Jerrold Instruction Book 435-345, Addendum A-1).

CIRCUIT DESCRIPTION

(Compare Dwg. E861-563)

Both ac power and r.f. signal enter the amplifier via connector J1. They are then separated in a filter network, the ac output of which is applied to a rectifier-filter. The pulsating dc voltage thus obtained is passed to the emitter of transistor Q1.

AC voltage can also be passed through switch S1 and another filter network to the r.f. output connector J2, thus permitting cascaded units to be energized.

Transistor Q1 is employed as a constant current regulator, supplying current to Zener diode CR4, which functions as a voltage regulator.

From the input filter the r.f. signal passes through a blocking capacitor and an equalizer network to the base of Q2. The equalizer network is factory-adjusted for correct low frequency response. Step-down transformers T1, T2 and T3 are used to match each collector output to the following circuit.

The output of T1 is shunted by a tilt control employing potentiometer R10 and coil L4. The control has sufficient range to compensate for an additional 10 db of cable at channel 13.

The signal is then applied to gain control potentiometer R12 and limiting resistor R11 which allows a gain reduction of 5 db.

From R12 the signal is then coupled to the base of Q3. The output from the collector of Q3 is coupled to the base of the final amplifier Q4 through transformer T2, coil L8 and coupling capacitor C15. This circuit is basically the same as the preceding interstage.

The output of Q4 is then passed through a small inductance L11 which is adjusted for best output match, and from there through transformer T3 coupled through capacitor C18 to the r.f. output connector J2. A parallel r.f. output is attenuated by 30 db through network C19, R20, R21 and brought out to test point J3.

INSTALLATION

A. TOOLS AND ACCESSORIES REQUIRED

1. 6" adjustable crescent wrench.
2. Cable cutting tool.
3. Tubing cutting tool (for aluminum-sheathed cable).
4. Screw driver, and ¼" and 5/16" socket wrenches.
5. Cable cutting templates Model CGV-404, CGV-408, CGV-412, or CGV-500.
6. 2 coaxial cable fittings, Models VSF-404, VSF-408, VSF-412 or VSF 500.
7. Weatherproofing compound (Dow-Corning Silicone #5).

B. INSTALLATION PROCEDURE (Compare Fig. 1, 2, 3)

1. Remove amplifier from housing by loosening both hex screws and pulling on knurled knobs.
2. Install coaxial cable fittings (see addendum to Instruction Book 435-345) at each end of the housing, according to the type of feeder cable used in the system. Wrench-tighten on each fitting the hex nut adjacent to the housing.
3. Install two lashing wire clamps on feeder cable about 5 ft. apart.
4. Cut the feeder cable midway between the lashing wire clamps; dress the cable ends using the appropriate templates; make expansion loops.
5. Mount the housing with the built-on clamps loosely engaging the messenger cable as shown in Fig. 1. Do not tighten fully the hex bolts on the clamps.
6. Feed the coaxial cable ends (use Silicone #5 compound on the bare center conductor and 2" of sheath on aluminum cables) all the way into the VSF fittings, making sure the bare center conductors are visible beyond the stainless steel crown washers within the plastic clamp support; tighten the slotted hex machine screws in the clamp support with a ¼" socket wrench or a screw driver; compare Fig 2a.
7. Wrench-tighten the hex nuts on the VSF fittings adjacent to the coaxial cable. Where Xelon-jacketed cable is used, insert lubricant into protective boot and slide boot over entire connection.
8. Holding the amplifier module by the 2 built-on knobs, plug it into the housing so that arrow shown on the underside points in the direction of signal flow. Then tighten both hex screws with a screw driver or a 5/16" socket wrench, securing the amplifier to the housing; compare Fig. 2b.
9. Now adjust position of Model TLE-1 on the messenger, seeing that the expansion loops are of approximately the same size; then wrench-tighten the hex bolts on the built-on clamps of the housing.
10. Switching on the remote power supply will now energize the line extender.
11. Use a Jerrold Model 704-B field strength meter to measure the r.f. output at test point J3 of the amplifier, with the 704-B energized from a truck-based inverter and regulator power supply.
12. Adjust GAIN control for desired output on the highest channel carried on the system; adjust TILT control for desired output on the lowest channel carried on the system.

NOTES: a) Model TLE-1 is shipped with switch S1 in POWER-STOP position, with POWER-THRU position taped over to prevent accidental switching. Where other amplifiers down the line are to be energized, remove the tape, switch to POWER-THRU position and replace tape over POWER-STOP position.

b) For installation with Auxiliary Hanger Bracket Model AHB-1 see Fig. 3 and Instruction Sheet 435-425.

Figure 2a

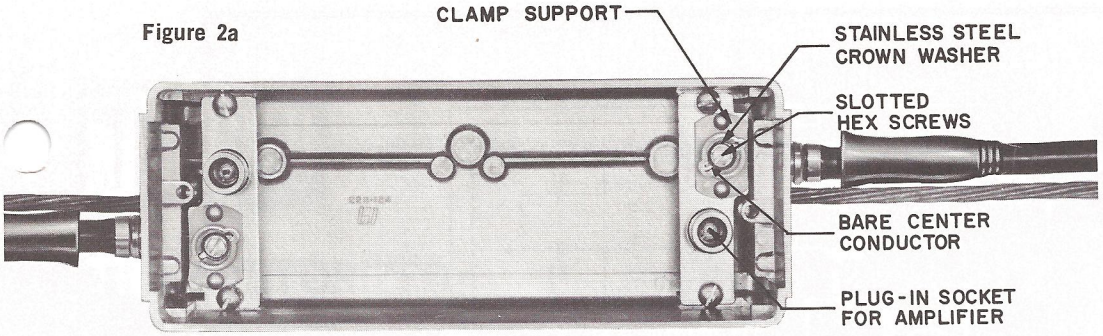
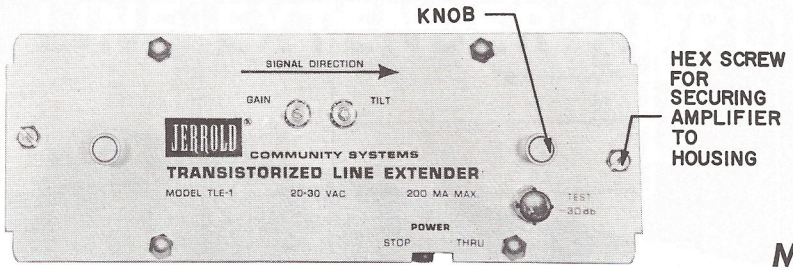


Figure 2

Model TLE-1, Housing Mounted, Amplifier Module Removed.

Figure 2b



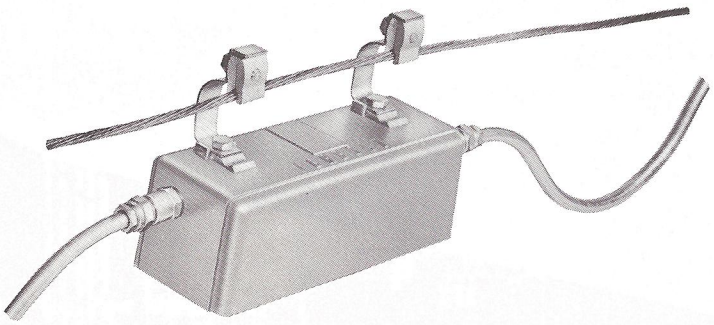


Figure 3
Model TLE-1 Mounted with Hanger Brackets.

MAINTENANCE

The solid-state design and rugged construction of Model TLE-1 ensure reliable operation at minimum maintenance. Should it ever become necessary to replace a transistor, only exactly the same type may be substituted; such servicing should be carried out only by qualified personnel, experienced in servicing transistor circuitry. An occasional check of the r.f. output at test point J3 and slight adjustment of GAIN and TILT controls may be all that is necessary for system maintenance.

A schematic circuit diagram with critical voltage check points and a replacement parts list are given here for the benefit of service men.

REPLACEMENT PARTS LIST

CIRCUIT DESIGNATION	QTY.	DESCRIPTION	JERROLD PART NO.
CAPACITORS			
C1, 18, 19, 21	4	1000 pf, ceramic disc	123-115
C2	1	15 pf, ±5%, 500 v, Dur-Mica	126-085
C3	1	7.5 pf, ±5%, 500 v	122-014
C4, 12	2	5-25 pf, trimmer	128-533
C5, 9, 10, 11, 13, 14, 16, 20	8	0.02 uf, +80 —20%, 25 v, ceramic disc	124-065
C6	1	0.01 uf, 200 v, ceramic disc	124-128
C7	1	100 uf, 50 v, electrolytic	127-050
C8	1	200 uf, 3 v, electrolytic	127-021
COILS			
L1, 10	2	Choke coil assemblies	B157-044
CONNECTORS			
J1, 2	2	Model G-61	B821-197
J3	1	Model F-81A	B821-108-2
DIODES			
CR1, 2	2	Silicon diode	137-718
CR3	1	Silicon diode	137-712
CR4	1	Zener diode	137-720

CIRCUIT DESIGNATION	QTY.	DESCRIPTION	JERROLD PART NO.
RESISTORS			
R1	1	200 ohms ±5%, ¼ w	112-984
R2	1	180 ohms ±5%, ¼ w	112-994
R3	1	75 ohms ±5%, ¼ w	112-954
R4, 13, 17	3	3.9 k ±5%, ¼ w	112-979
R5, 14, 18	3	5.6 k ±5%, ¼ w	112-919
R6, 15, 19	3	270 ohms, ±5%, ¼ w	112-993
R7	1	13 ohms, ±5%, ½ w	112-125
R8	1	1.5 k ±5%, ¼ w	112-167
R9	1	1.5 k ±5%, ¼ w	112-966
R10	1	500 ohms ±10%, ½ w, potentiometer	B118-122
R11, 16	2	130 ohms ±5%, ¼ w	112-997
R12	1	100 ohms ±10%, ½ w, potentiometer	B-118-131
R20, 21	2	½ k ±5%, ¼ w	112-921
SWITCH			
S1	1	SPDT slide switch	B162-030
TRANSFORMERS			
T1, 2, 3	3	Transformer assemblies	B144-077
TRANSISTORS			
Q1	1	Ge transistor	130-110
Q2, 3, 4	3	Si transistor	S130-112

SCHEMATIC

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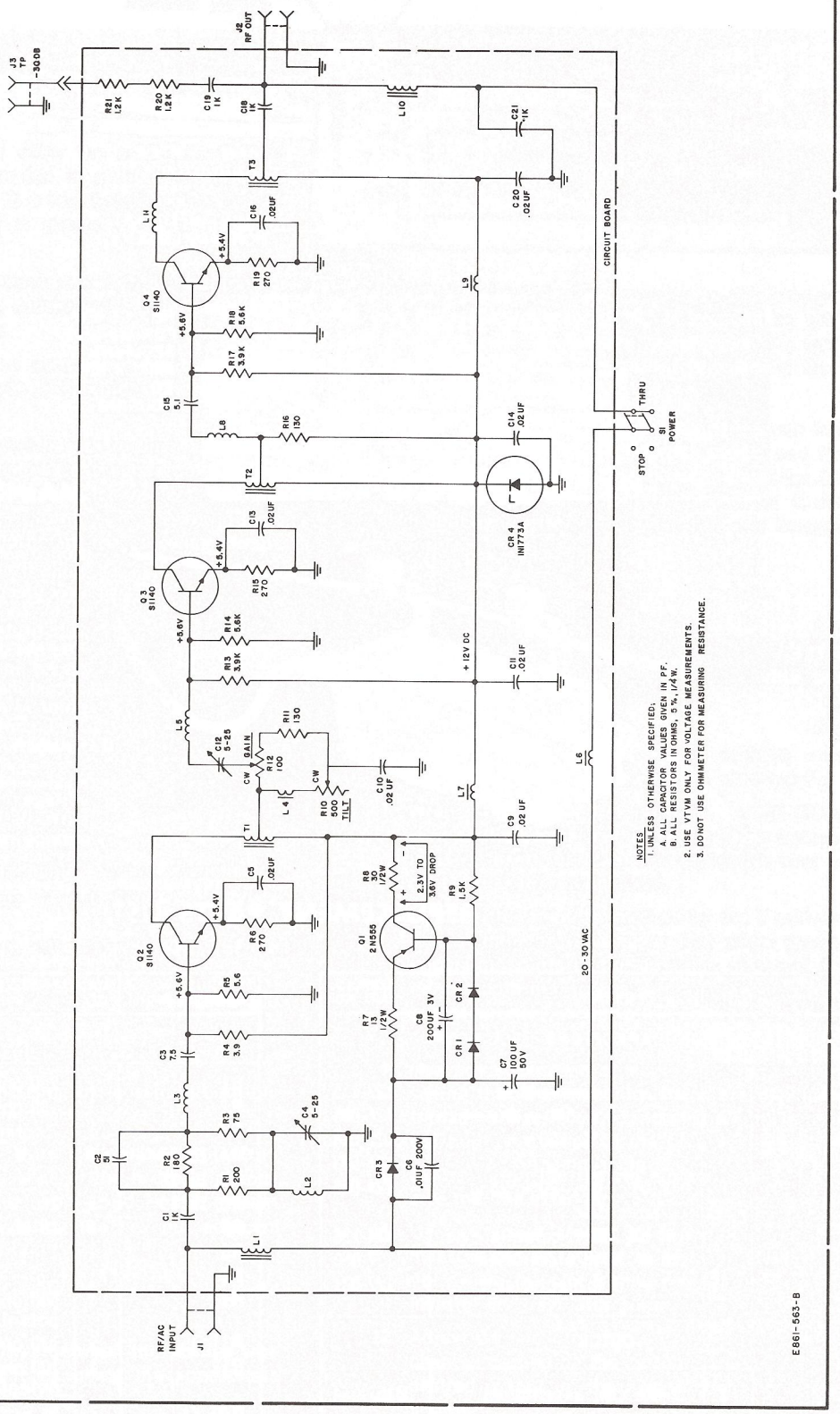
MODEL TLE-I



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