

## Line Extender III Type 3 750 MHz with 40/52 MHz Split



22872

### DESCRIPTION

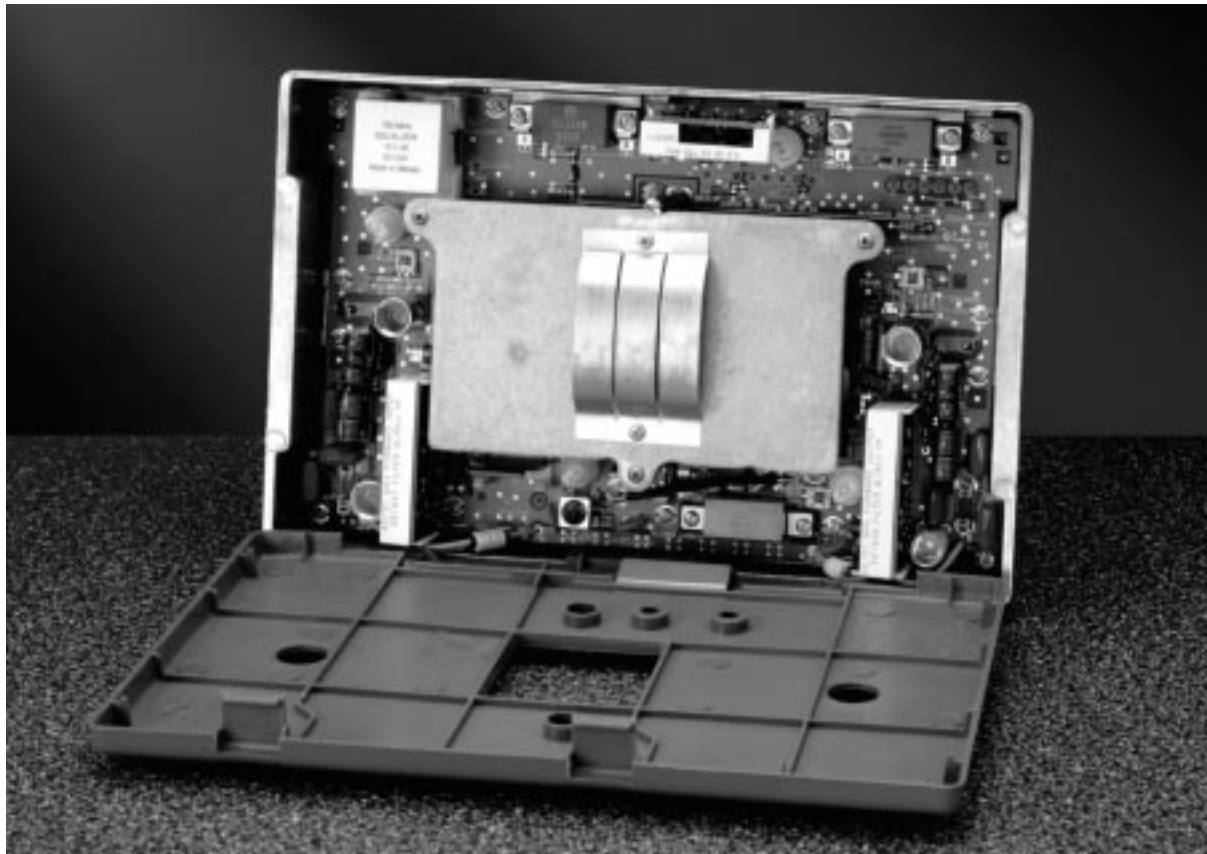
The Type 3 RF amplifier module offers a high performance design solution for the latest HFC networks.

The amplifier module comes pre-configured with interstage equalizer, diplexers, reverse amplifier, and either AGC for a 3A, Thermal for a 3T, or jumper for a 3M module, in order to achieve optimum station performance. Additionally, maximum flexibility in reverse signal path alignment is achieved via the reverse test point and plug-in pad for the reverse input.

The Type 3 amplifier module provides one (bridger level) output.

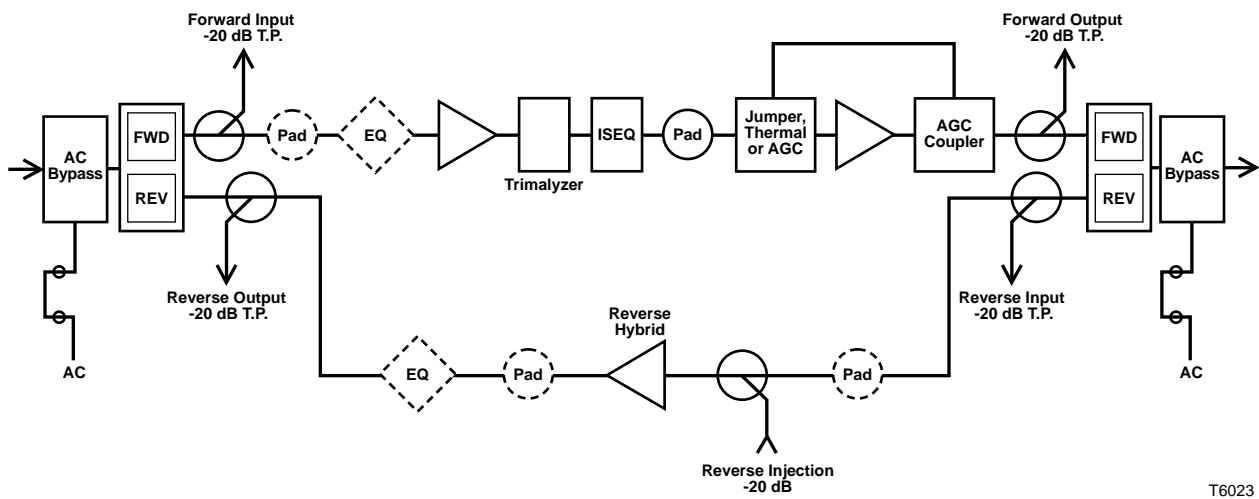
### FEATURES

- 60 and 90 V AC powering capability
- 15 ampere current capacity (steady state) and 25 ampere surge survivability
- Integrated reverse amplifier, with optimized diplex filter group delay for forward and reverse paths
- Reverse input test point and input pad allowing optimum reverse path alignment
- Improved station frequency response
- Unitized design (amplifier and power supply in a single module) enabling simplified and faster maintenance
- High efficiency, transformerless power supply lowering system operating cost
- Directional Coupler RF testpoints provide optimum accuracy
- Surge Resistant™ Circuitry ensuring hybrid protection without fuses or other nuisance failure causing devices



22882

### LINE EXTENDER III-TYPE 3 – 5-40/52-750 MHz



T6023

## LINE EXTENDER III TYPE 3 – 5-40/52-750 MHz

### General Station Performance Data

	Units	Forward			Reverse
Pass Band	MHz	52-750			5-40
Amplifier Type	---	PHD			PP
Operational Temperature Range	degrees	-40 to +140 F			-40 to +140 F
Frequency Response	dB	±0.5			±0.5
Auto Slope & Gain Range	dB	±4			N/A
Return Loss	dB	16			16
Operational AC Through Current	Amps	15			N/A
Max AC Through Current (2 hrs)	Amps	25			N/A
Hum Modulation @ 10 A (over specified frequency range)	dB	70 (55-750 MHz)			58 (5-15 MHz) 65 (16-40 MHz)
Hum Modulation @ 15 A (over specified frequency range)	dB	62 (55-150 MHz) 60 (151-600 MHz) 58 (601-750 MHz)			50 (5-15 MHz) 59 (16-40 MHz)
Test Points (±0.5 dB)	dB	-20			-20
Reference Output Level—High Freq.	dBmV	46 @ 750 MHz 44 @ 550 MHz			35 @ 40 MHz <sup>7</sup>
Reference Output Level—Low Freq.	dBmV	36 @ 54 MHz			35 @ 5 MHz <sup>7</sup>
Reference Output Tilt <sup>1</sup>	dB	10			0
		<b>3M</b>	<b>3T</b>	<b>3A</b>	
Interstage Level Control (type)		None	Thermal	AGC w/ Man. Backoff	N/A
Interstage Equalizer (value - type)	dB	9 - fixed	14.5 - fixed	9 - fixed	N/A
Current Draw @ 24 V DC	Amps	0.63	0.63	0.73	0.13
Operational Gain (minimum) <sup>3,8</sup>	dB	30.5	29.5	28.5	19.5
Internal Tilt <sup>2</sup> (±0.5 dB)	dB	+7.2	+7.2	+7.2	0
Noise Figure <sup>3</sup> @ 54 MHz	dB	7.5	7.5	7.5	---
Noise Figure <sup>3</sup> @ 750 MHz	dB	9	9	9	---
Reverse Noise Figure <sup>8</sup>	dB	---	---	---	6

### Forward and Reverse Performance with Specified Channel Loading

	Units	3M	3T	3A	Reverse
CW Channel Loading	NTSC	79 w/digital <sup>4</sup>	79 w/digital <sup>4</sup>	79 w/digital <sup>4</sup>	6
Composite Triple Beat <sup>5</sup>	dB	71	71	71	92
Cross Modulation <sup>6</sup>	dB	67	67	66	80
Composite Second Order <sup>5</sup> (high side)	dB	68	68	68	82

### Delay Characteristics

Forward (Chrominance to Luminance Delay)		Reverse (Group Delay in 1.5 MHz BW)	
Freq. (MHz)	Delay (ns)	Freq. (MHz)	Delay (ns)
55.25 - 58.83	24	38.5 - 40.0	25
61.25 - 64.83	12	33.5 - 35.0	8
67.25 - 70.83	6	10.0 - 11.5	6
77.25 - 80.83	3	5.0 - 7.5	55

#### Notes:

- (1) Reference output tilt is specified as "CABLE" tilt (as opposed to traditional "linear" tilt).
- (2) Down tilt, the effect of cable, is represented by a (-). Up tilt, the effect of equalization, is represented by a (+).
- (3) Forward gain and noise figure measured with 0 dB input EQ and 1 dB input pad.
- (4) "Digital" refers to 550-750 MHz loading with 33 QAM carriers at -6 dB levels relative to analog video carrier levels.
- (5) CTB and CSO measured using CW carriers, with spectrum analyzer as the measurement device.
- (6) X-Mod (@ 15.75 kHz) specified using 100% synchronous modulation and frequency selective measurement device.
- (7) Reverse output reference level with a 0 dB reverse output equalizer and factory selected reverse output pad.
- (8) Reverse gain and noise figure for station with 0 dB reverse input pad, 0 dB reverse output EQ, and factory-selected reverse output pad.

Unless otherwise noted, the above specifications reflect typical station performance at stated reference levels in the recommended operating configuration, including the input equalizer and reverse filters where applicable. Unless otherwise noted, specifications are based on measurements made in accordance with NCTA Practices for Measurements on Cable Television Systems using standard frequency assignments and are referenced to 68°F (20°C).

# Line Extender III-Type 3 — 5-40/52-750 MHz

## Station Powering Data

Line Extender III		I DC (Amps)	AC Voltage											
			90	85	80	75	70	65	60	55	50	45	40	35
Type 3M/3T	AC Current (A)	0.76	0.38	0.41	0.42	0.44	0.46	0.48	0.49	0.52	0.55	0.58	0.61	0.67
	Power (W)		22.2	21.8	21.8	21.9	21.5	21.8	21.8	21.7	22.3	22.3	21.8	22.2
Type 3A	AC Current (A)	0.86	0.42	0.46	0.46	0.48	0.50	0.52	0.54	0.57	0.60	0.64	0.68	0.76
	Power (W)		24.7	24.4	24.3	24.4	24.2	24.3	24.4	24.3	24.8	24.8	24.4	24.6

Data is based on stations configured for 2-way operation. Power supply has 30 V AC undervoltage lockout.

## ORDERING INFORMATION

### Amplifier Module - 1 required

- # 545397 - Type 3M amplifier module (Manual)

**Note:** 3M amplifier module comes configured with reverse amplifier, 9.0 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 40/51 diplex filters, integrated power supply.

- # 545297 - Type 3T amplifier module with Thermal

**Note:** 3T amplifier module also comes configured with reverse amplifier, 14.5 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 40/51 diplex filters, integrated power supply.

- # 545197 - Type 3A amplifier module with AGC. AGC has 445.25 MHz pilot frequency and manual temperature backoff control.

**Note:** 3A amplifier module also comes configured with reverse amplifier, 9.0 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 40/51 diplex filters, integrated power supply.

### Housing - 1 required (all have 15 amp capacity)

- # 545443 Uncoated 2-port housing
- # 545444 Coated 2-port housing

### Required Accessories

- Plug-in Pads (attenuators):
  - 1 required for forward (1 input)
  - 2 required for reverse (1 input, 1 output)
  - 1 required for AGC only if amplifier output levels at pilot frequency is NOT 42 dBmV (AGC comes configured with a 14 dB pad, which is appropriate for 42 dBmV output level at pilot frequency).

Available in 0.5 dB steps from 0 to 20 dB. Order Model PP-\* (\* denotes pad value); specify value.

- Plug-in Forward Input Equalizer, 1 required. Available in 1.5 dB steps from 0 to 28.5 dB at 750 MHz. Order Model EQ750-\* (\* denotes equalizer value); specify value.
- Reverse Equalizer, Variable or Fixed, 1 required (reverse output), select one of either type:

#### Variable Reverse Equalizers

- #511075 1.5 to 4.5 dB at 40 MHz
- #511295 4.5 to 7.5 dB at 40 MHz
- #511298 7.5 to 12.0 dB at 40 MHz

#### Fixed Reverse Equalizers

Available in 1 dB steps from 1 to 12 dB at 40 MHz. Order Model EQ40S-\* (\* denoted equalizer value), specify value.

### Optional Accessories

- #467351 230 V AC Crowbar Surge Protector
- Plug-in Cable Simulator. Simulates cable losses, creating tilt opposite that of Equalizers. Use in place of Forward Input Equalizer as needed to maintain proper output tilt in short spaced locations. Available in 1.5 dB steps from 1.5 dB to 12.0 dB cable loss at 750 MHz. Order Model CS 750-\* (\* denotes CS value; specify value).

### Related Equipment

- #501111 Long Reach Test Point Adapter
- #276982 Reverse Injection Probe (3 dB insertion loss)
- #548771 Pad Insertion/Removal Tool

## MECHANICAL SPECIFICATIONS

### Housing Dimensions

- 11.5 in. L x 9.5 in. H x 4.0 in. D
- 292.1 mm L x 241.3 mm H x 101.6 mm D

### Weight

- Housing 6 lbs, 6 oz; 2.9 kg
- Module 2 lbs, 13 oz; 1.3 kg

Specifications and product availability are subject to change without notice.

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