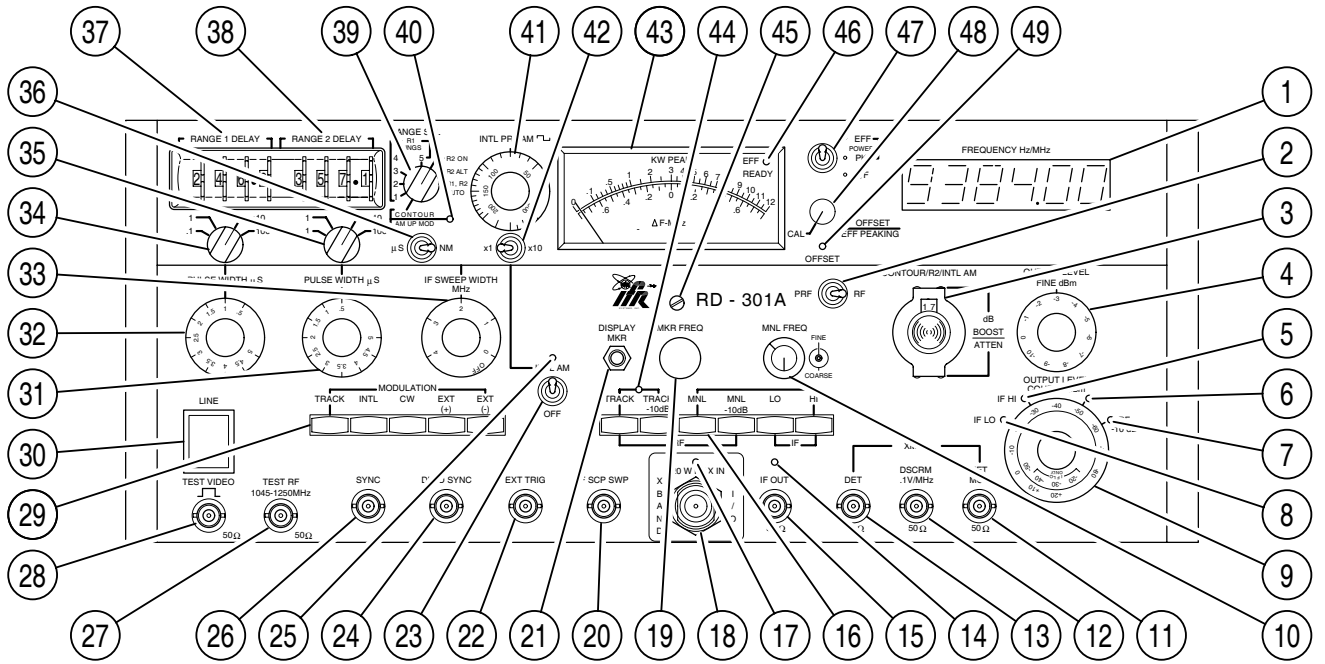
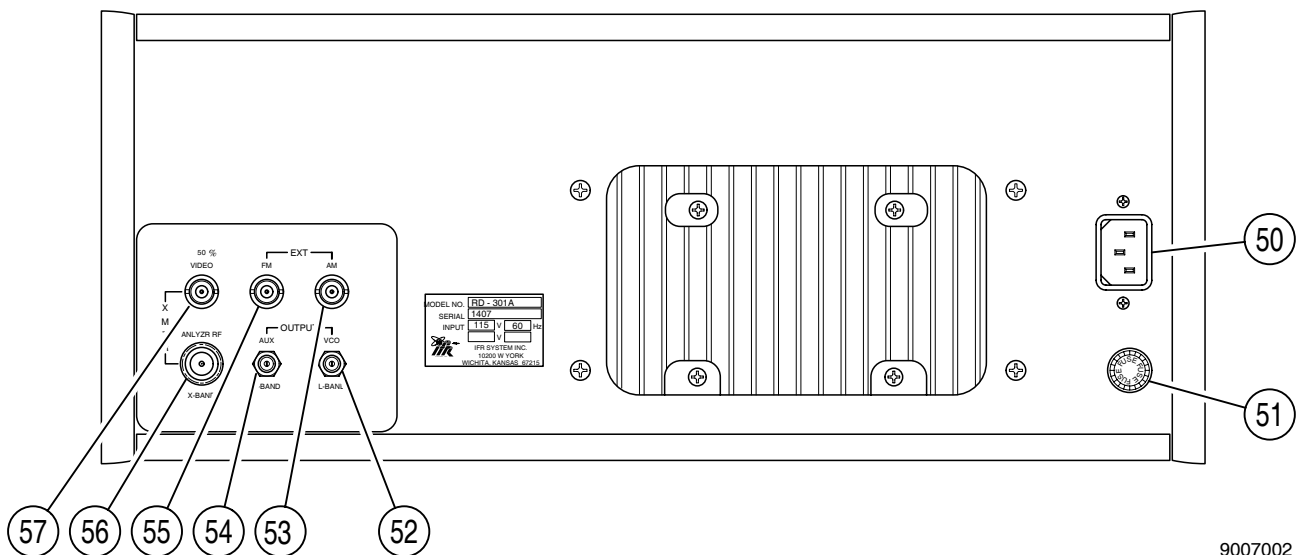


APPENDIX F - CONTROLS, CONNECTORS AND INDICATORS



9007001



9007002

RD-301A Front and Rear Panels
Figure 1

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. FREQUENCY Hz/MHz Digital Display 2. PRF/RF Switch 3. CONTOUR/R2/INTL AM dB BOOST/ATTEN Control 4. OUTPUT LEVEL FINE dBm Control 5. IF HI Indicator 6. RF Indicator 7. RF -10 dB Indicator 8. IF LO Indicator 9. OUTPUT LEVEL COARSE dBm Control 10. MNL FREQ Controls 11. XMTR HET MON Connector (J49028) 12. XMTR DSCRM .1V/MHz Connector (J49027) 13. XMTR DET Connector (J49026) 14. IF OUT Indicator 15. IF OUT Connector (J49025) 16. RF/IF MODE Pushbutton Switches 17. X-BAND SIGNAL Indicator 18. X-BAND I/O Connector (J49016) 19. MKR FREQ Control 20. IF SCP SWP Connector (J49012) 21. DISPLAY MKR Switch 22. EXT TRIG Connector (J49024) 23. INTL AM Switch 24. DLYD SYNC Connector (J49023) 25. INTL AM Indicator 26. SYNC Connector (J49022) 27. TEST RF 1045-1250 MHz Connector (J49021) 28. TEST VIDEO Connector (J49020) 29. MODULATION MODE Pushbutton Switches | <ol style="list-style-type: none"> 30. LINE Switch 31. PULSE WIDTH μS Control (RANGE 2) 32. PULSE WIDTH μS Control (RANGE 1) 33. SWEEP WIDTH MHz Control 34. PULSE WIDTH MULTIPLIER Control (RANGE 1) 35. PULSE WIDTH MULTIPLIER Control (RANGE 2) 36. μS/NM Switch 37. RANGE 1 DELAY Thumbwheels 38. RANGE 2 DELAY Thumbwheels 39. RANGE SEL Switch 40. CONTOUR/AM UP MOD Indicator 41. INTL PRF/AM Control 42. X1/X10 INTL PRF/AM Switch 43. PANEL Meter 44. TRACK Indicator 45. PANEL METER ZERO Control 46. EFF READY Indicator 47. METER SELECT Switch 48. ΔF OFFSET/EFF PEAKING Control 49. OFFSET Indicator 50. AC INPUT Connector (49008) 51. FUSE 52. VCO L-BAND OUTPUT Connector (J49004) 53. AM EXT INPUT Connector (J49005) 54. AUX X-BAND OUTPUT Connector (J49002) 55. FM EXT INPUT Connector (J49006) 56. ANALYZER RF X-BAND XMTR Connector (J49003) |
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A. RD-301A Front Panel

ITEM	DESCRIPTION
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1. FREQUENCY Hz/MHz Digital Display

Displays PRF (Hz), IF (MHz) or RF (MHz) as selected with PRF/RF Switch (2) and RF/IF MODE Pushbutton Switches (16). Marker frequency (MHz) is displayed when DISPLAY MKR Switch (21) is pressed. Refer to Appendix F, Table 1.

FREQUENCY TYPE	MODE	DISPLAY
PRF	RF TRACK/RF TRACK -10 dB	UUT Transmitter PRF
PRF	INTL	RD-301A Internal Oscillator PRF (Internal AM frequency if On)
PRF	EXT (+), EXT (-)	External Trigger Signal PRF
RF	IF LO/IF HI	IF Signal Generator Frequency
RF	IF LO/IF HI DISPLAY MKR Switch (21) pressed	IF Marker Frequency
RF	RF TRACK/RF TRACK -10 dB	RF Signal Generator/UUT Transmitter Frequency
RF	RF MNL/RF MNL -10 dB	RF Signal Generator Frequency

FREQUENCY Hz/MHz Digital Display Control
Table 1

2. PRF/RF Switch

Toggle switch selects type of frequency shown on FREQUENCY Hz/MHz Digital Display (1). Refer to Appendix F, Table 1.

3. CONTOUR/R2/INTL AM dB BOOST/ATTEN Control

Boosts or attenuates output level set with OUTPUT LEVEL COARSE dBm Control (9) and OUTPUT LEVEL FINE dBm Control (4). Inner knob controls level in 1 dB steps (0-9). Outer knob controls level in 10 dB steps (0-50). Selection appears in small viewing window at top center of control.

Boost is activated when RANGE SEL Switch (39) is in CONTOUR/AM MOD UP position and applies to output levels from -127 to -75 dBm. CONTOUR/R2/INTL AM dB BOOST/ATTEN Control boosts contour or internal AM level from 0 to 20 dB above selected output level.

NOTE: Selecting >20 dB boost produces minimal or no additional level increase >20 dB.

Attenuation is activated when RANGE SEL Switch (39) is in any R2 position (R2 ON; R2 ALT or R1,R2 AUTO) or RINGS 1 through 5 with internal AM activated. Range 2 reply or internal AM is attenuated from 0 to -59 dB referenced to Range 1 reply level set with OUTPUT LEVEL COARSE dBm Control (9) and OUTPUT LEVEL FINE dBm Control (4).

ITEM	DESCRIPTION
4. OUTPUT LEVEL FINE dBm Control	Decreases RF or IF output level in 1 dB steps referenced to level set with OUTPUT LEVEL COARSE dBm Control (9). Range is from 0 to -10 dB.
5. IF HI Indicator	Green LED illuminates when IF HI is selected with RF/IF MODE Pushbutton Switches (16). Green indicates color of scale used on OUTPUT LEVEL COARSE dBm Control (9).
6. RF Indicator	Red LED illuminates when RF TRACK or RF MNL is selected with RF/IF MODE Pushbutton Switches (16). Red indicates color of scale used on OUTPUT LEVEL COARSE dBm Control (9).
7. RF -10 dB Indicator	Red LED illuminates when RF TRACK -10 dB or RF MNL -10 dB is selected with RF/IF MODE Pushbutton Switches (16). Red indicates color of scale used on OUTPUT LEVEL COARSE dBm Control (9).
8. IF LO Indicator	Red LED illuminates when IF LO is selected with RF/IF MODE Pushbutton Switches (16). Red indicates color of scale used on OUTPUT LEVEL COARSE dBm Control (9).
9. OUTPUT LEVEL COARSE dBm Control	Varies RF or IF output level in 10 dB increments. Red and green scales on control knob are used according to mode selected with RF/IF MODE Pushbutton Switches (16). Each mode is indicated with an index mark and red or green LED. RF output level is calibrated to -127 dBm using the red scale.
10. MNL FREQ Controls	Sets signal generator frequency for RF MNL, RF MNL -10 dB, IF LO or IF HI mode selected with RF/IF MODE Pushbutton Switches (16). Coarse adjust (outer knob) and fine adjust (inner knob) set frequency shown on FREQUENCY Hz/MHz Digital Display (1).
11. XMTR HET MON Connector (J49028)	Provides output for displaying radar transmitter pulse frequency characteristics on external oscilloscope. BNC connector requires 50 Ω load for operation.
12. XMTR DSCRM .1V/MHz Connector (J49027)	Provides output for displaying radar transmitter frequency versus time characteristics on external oscilloscope. BNC connector requires 50 Ω load for an output calibrated at 0.1 V/MHz. System reference pulse, 5 μ s wide, occurs approximately 15 μ s after transmitter pulse. Reference voltage corresponds to frequency shown on FREQUENCY Hz/MHz Digital Display (1).
13. XMTR DET Connector (J49026)	Provides output for displaying radar transmitter pulse shape characteristics on external oscilloscope. BNC connector requires 50 Ω load to preserve pulse fidelity.

ITEM	DESCRIPTION
14. IF OUT Indicator	Red LED illuminates when IF LO or IF HI is selected with RF/IF MODE Pushbutton Switches (16) and indicates IF output is available at IF OUT Connector (15).
15. IF OUT Connector (J49025)	Provides IF signal generator output. Signal level is set with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9). BNC connector requires 50 Ω load for operation.
16. RF/IF MODE Pushbutton Switches	Selects one of the following RF or IF operating modes:
	● RF TRACK
	RF signal generator acquires and tracks frequency of UUT transmitter signal received through X-BAND I/O Connector (18). RF Indicator (6) and X-BAND SIGNAL Indicator (17) illuminate when RF TRACK mode is selected.
	● RF TRACK -10 dB
	Used with external 10 dB coaxial attenuator inserted at Waveguide Coupler to provide for UUT transmitters with >12 kW (up to 120 kW) peak power out-put. RF signal generator acquires and tracks frequency of UUT transmitter signal received through X-BAND I/O Connector (18). RF -10 dB Indicator (7) and X-BAND SIGNAL Indicator (17) illuminate when RF TRACK -10 dB mode is selected.
	NOTE: Transmitting replies from the RD-301A while the UUT transmitter is operating during TRACK operations may cause tracking inaccuracies at high generator levels (>-75 dBm). To avoid possible tracking error, the range delay is set greater than the UUT transmitter pulse width.
	● RF MNL
	RF signal generator frequency is set from 9.295 to 9.500 GHz with MNL FREQ Controls (10). Output is calibrated at R/T unit with Serialized Coaxial Cable and Waveguide Coupler. RF Indicator (6) and X-BAND SIGNAL Indicator (17) illuminate when RF MNL mode is selected.
	● RF MNL -10 dB
	Used with external 10 dB Attenuator inserted at Waveguide Coupler to provide for UUT transmitters with >12 kW (up to 120 kW) peak power output. RF signal generator frequency is set from 9.295 to 9.500 GHz with MNL FREQ Controls (10). X-BAND SIGNAL Indicator (17) and RF -10 dB Indicator (7) illuminate when RF MNL -10 dB mode is selected.
	● IF LO
	Activates IF signal generator in low power range from -132 to -20 dBm as selected with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9). MNL FREQ Controls (10) vary IF frequency from 20 to 70 MHz. IF LO Indicator (8) and IF OUT Indicator (14) illuminate when IF LO mode is selected.

ITEM	DESCRIPTION
● IF HI	<p>Activates IF signal generator in high power range from -92 to +20 dBm as selected with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9). MNL FREQ Controls (10) vary IF frequency from 20 to 70 MHz. IF HI Indicator (5) and IF OUT Indicator (14) illuminate when IF HI mode is selected.</p>
17. X-BAND SIGNAL Indicator	<p>Red LED illuminates when RF TRACK, RF TRACK -10 dB, RF MNL or RF MNL -10 dB is selected with RF/IF MODE Pushbutton Switches (16) and indicates RF output is available at the X-BAND I/O Connector (18).</p>
18. X-BAND I/O Connector (J49016)	<p>N connector couples RD-301A to UUT through antenna waveguide. Output is calibrated at R/T unit using Serialized Coaxial Cable and Waveguide Coupler furnished with Test Set. Output level is set using the OUTPUT LEVEL COARSE dBm Control (9), OUTPUT LEVEL FINE dBm Control (4) and (if applicable) CONTOUR/R2/INTL AM dB BOOST/ATTEN Control (3).</p> <p>CAUTION: MAXIMUM INPUT LEVEL CANNOT EXCEED 120 W.</p>
19. MKR FREQ Control	<p>Adjusts IF marker frequency when DISPLAY MKR Switch (21) is pressed.</p>
20. IF SCP SWP Connector (J49012)	<p>BNC connector provides an approximate 5 VP-P, 100 Hz ramp output for horizontal drive to external oscilloscope during IF sweep tests.</p>
21. DISPLAY MKR Switch	<p>Momentary contact switch adds marker signal (approximately -20 dBc) to IF output, when pressed. Marker frequency is set with MKR FREQ Control (19) and shown on FREQUENCY Hz/MHz Digital Display (1).</p>
22. EXT TRIG Connector (J49024)	<p>BNC connector used to apply external trigger when EXT (+) or EXT (-) is selected with MODULATION MODE Pushbutton Switches (29). Trigger input requires 2 to 25 V peak pulse or sine wave to initiate range delay.</p>
23. INTL AM Switch	<p>INTL AM (On)/OFF toggle switch adds 50% AM (square wave) to reply pulse output. Frequency is set with INTL PRF/AM Control (41) and X1/X10 INTL PRF/AM Switch (42). Amplitude is set with CONTOUR/R2/INTL AM BOOST/ATTEN Control (3) and is relative to output level set with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9).</p>
24. DLYD SYNC Connector (J49023)	<p>BNC connector provides delayed synchronous pulse output to external oscilloscope. Leading edge of positive pulse is coincident with leading edge of reply pulse.</p>
25. INTL AM Indicator	<p>Red LED illuminates when internal AM is activated with INTL AM Switch (23).</p>

ITEM	DESCRIPTION
26. SYNC Connector (J49022)	BNC connector provides synchronous pulse output to external oscilloscope. Leading edge of positive pulse is coincident with start of each range delay.
27. TEST RF 1045-1250 MHz Connector (J49021)	BNC connector, providing 50 Ω load, receives L-Band test signals for calibration and verification of tracking circuits.
28. TEST VIDEO Connector (J49020)	BNC connector, providing 50 Ω load, receives external pulse signals and is used with TEST RF 1045-1250 MHz Connector (27) for calibration and verification.
29. MODULATION MODE Pushbutton Switches	Selects range delay trigger source or enables continuous wave output. Selectable modes are as follows:
	<ul style="list-style-type: none"> ● TRACK Starts range delay coincident with leading edge of UUT transmitter pulse at 50% amplitude point.
	<ul style="list-style-type: none"> ● INTL Starts range delay with every leading edge of pulses generated by internal PRF oscillator. Triggering rate is set with INTL PRF/AM Control (41).
	<ul style="list-style-type: none"> ● CW Selects continuous wave RF output at X-BAND I/O Connector (18) or continuous wave IF output at IF OUT Connector (15) according to RF/IF MODE Pushbutton Switches (16).
	<ul style="list-style-type: none"> ● EXT (+) Starts range delay when triggered with rising edge of a 2 to 25 V peak pulse or positive half of sine wave input applied to EXT TRIG Connector (22).
	<ul style="list-style-type: none"> ● EXT (-) Starts range delay when triggered with falling edge of a 2 to 25 V peak pulse or negative half of sine wave input applied to EXT TRIG Connector (22).
30. LINE Switch	Applies power to RD-301A.
31. PULSE WIDTH μ S Control (RANGE 2)	Adjusts Range 2 reply pulse width from 0.05 to 500 μ s, depending on PULSE WIDTH MULTIPLIER Control (RANGE 2) (35) setting. PULSE WIDTH μ S Control (RANGE 2) setting is variable from 0.5 to 5 μ s and is multiplied by the PULSE WIDTH MULTIPLIER Control (RANGE 2) (35) setting to obtain the Range 2 reply pulse width.

ITEM	DESCRIPTION
32. PULSE WIDTH μ S Control (RANGE 1)	Adjusts pulse width from 0.05 μ s to 2.5 ms, depending on PULSE WIDTH MULTIPLIER Control (RANGE 1) (34) setting. PULSE WIDTH μ S Control (RANGE 1) setting is variable from 0.5 to 5 μ s and is multiplied by the PULSE WIDTH MULTIPLIER Control (RANGE 1) (34) setting to obtain the pulse width. Range 1 reply width is set in RF operating modes or IF pulse width is set in IF operating modes according to RF/IF MODE Pushbutton Switches (16).
33. SWEEP WIDTH MHz Control	Sets sweep width (in MHz) of IF signal generator output. Sweep width is set from 0 to 4 MHz. Sweep rate is 100 Hz. Control has detent OFF position.
34. PULSE WIDTH MULTIPLIER Control (RANGE 1)	Selects multiplier (.1, 1, 10, 100 or 500) used with PULSE WIDTH μ S Control (RANGE 1) (32) setting. The PULSE WIDTH MULTIPLIER Control (RANGE 1) setting multiplied by the PULSE WIDTH μ S Control (RANGE 1) (32) setting obtains Range 1 reply or IF pulse width.
35. PULSE WIDTH MULTIPLIER Control (RANGE 2)	Selects multiplier (.1, 1, 10 or 100) used with PULSE WIDTH μ S Control (RANGE 2) (31) setting. The PULSE WIDTH MULTIPLIER Control (RANGE 2) setting multiplied by the PULSE WIDTH μ S Control (RANGE 2) (31) setting obtains Range 2 reply pulse width.
36. μ S /NM Switch	Selects unit of measurement (microseconds [μ S] or nautical miles [NM]) for both Range 1 and Range 2 simulated reply delays.
37. RANGE 1 DELAY Thumbwheels	Sets delay for Range 1 simulated reply. Delay is set from 0.1 to 999.9 in microseconds or nautical miles depending on position of μ S/NM Switch (36). A residual time delay (nominally 0.1 μ s) is added to the delay set by RANGE 1 DELAY Thumbwheels. The source selected by the MODULATION MODE Pushbutton Switches (29) triggers the delay.
38. RANGE 2 DELAY Thumbwheels	Sets delay for Range 2 simulated reply. Delay is set from 0.2 to 999.9 in microseconds or nautical miles depending on position of μ S/NM Switch (36). A residual time delay (nominally 0.4 μ s) is added to the delay set by RANGE 2 DELAY Thumbwheels. The source selected by the MODULATION MODE Pushbutton Switches (29) triggers the delay.

ITEM	DESCRIPTION
39. RANGE SEL Switch	<p data-bbox="381 291 1414 348">Provides simulated reply variations. Nine position rotary switch selects boost, selects number of Range 1 reply rings (1-5) or activates Range 2 reply.</p> <ul style="list-style-type: none"> <li data-bbox="381 369 740 396">● CONTOUR/AM UP MOD <p data-bbox="428 415 1492 579">Provides selectable 0 to 20 dB boost above level set with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9). Boost is set using CONTOUR/R2/INTL AM dB BOOST/ATTEN Control (3) and only applies when initial output levels are from -75 to -127 dBm. Range 1 reply is boosted when INTL AM Switch (23) is OFF. Internal AM is boosted when INTL AM Switch (23) is set to INTL AM.</p> <li data-bbox="381 602 678 630">● RINGS 1 through 5 <p data-bbox="428 651 1500 762">Selects number of equally spaced simulated Range 1 replies transmitted by the RD-301A. RANGE 1 DELAY Thumbwheels (37) set Ring 1 delay and distance between all succeeding rings (equidistant). Minimum range for Rings 2 through 5 is 0.3 μs or 0.3 nmi.</p> <li data-bbox="381 785 516 812">● R2 ON <p data-bbox="428 833 1500 968">Activates Range 2 reply in addition to Range 1 reply. Range 1 output level is set with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9). Range 2 output level is attenuated from Range 1 output level with CONTOUR/R2/INTL AM dB BOOST/ATTEN Control (3). Range 2 delay is set with RANGE 2 DELAY Thumbwheels (38).</p> <li data-bbox="381 991 526 1018">● R2 ALT <p data-bbox="428 1039 1500 1150">Activates Range 1 reply with every trigger as selected with MODULATION MODE Pushbutton Switches (29) and Range 2 reply every other trigger. Range 2 output level is attenuated from Range 1 output level with CONTOUR/R2/INTL AM dB BOOST/ATTEN Control (3).</p> <li data-bbox="381 1173 597 1201">● R1/R2 AUTO <p data-bbox="428 1222 1500 1333">Automatically selects Range 1 or Range 2 reply depending on width of UUT transmitter pulse. Only Range 1 reply responds when UUT transmitter pulse width is <0.4 μs. Only Range 2 reply responds when UUT transmitter pulse width is >0.4 μs.</p> <p data-bbox="428 1354 1479 1436">NOTE: If Range 1 delay set by RANGE 1 DELAY Thumbwheels (37) is <0.4 μs, Range 1 reply always responds. If Range 2 delay set by RANGE 2 DELAY Thumbwheels (38) is <0.4 μs, Range 2 reply never responds.</p> <p data-bbox="428 1457 1492 1514">NOTE: The factory calibrated threshold setting is 0.4 μs. The threshold setting is adjustable from 0.2 to 1.0 μs.</p>
40. CONTOUR/AM UP MOD Indicator	<p data-bbox="381 1583 1468 1631">Red LED illuminates when CONTOUR/AM UP position is selected with RANGE SEL Switch (39).</p>

ITEM	DESCRIPTION
41. INTL PRF/AM Control	Used with X1/X10 INTL PRF/AM Switch (42) to regulate the RD-301A internal oscillator frequency (Internal PRF and/or AM frequency). INTL PRF/AM Control sets internal AM frequency when INTL AM Switch (23) is set to INTL AM. INTL PRF/AM Control sets internal PRF when INTL is selected with MODULATION MODE Pushbutton Switches (29). INTL PRF/AM Control sets both internal PRF and AM frequency when INTL AM Switch (23) is set to INTL AM and INTL is selected with MODULATION MODE Pushbutton Switches (29). Frequency is adjustable from 50 to 500 Hz or 500 to 5000 Hz, depending on X1/X10 INTL PRF/AM Switch (42) position.
42. X1/X10 INTL PRF/AM Switch	Selects multiplier (X1 or X10) used with INTL PRF/AM Control (41) setting. The INTL PRF/AM Control (41) setting multiplied by 1 or 10 as selected with the X1/X10 INTL PRF/AM Switch provides the RD-301A internal oscillator frequency.
43. PANEL Meter	Indicates effective peak power of UUT transmitter, peak power of UUT transmitter or frequency offset between UUT transmitter and RD-301A Test Set signal generator. PANEL Meter operates when RF TRACK or RF TRACK -10 dB is selected with RF/IF MODE Pushbutton Switches (16). Function is selected by METER SELECT Switch (47).
	<ul style="list-style-type: none"> <li data-bbox="285 892 545 919">● KW PEAK Scale <p data-bbox="334 942 1386 1108">Indicates effective peak or peak RF power of UUT transmitter at X-BAND I/O Connector (18) using a 0.1 to 12 kW range. KW PEAK Scale is used when METER SELECT Switch (47) is set to EFF POWER or PK POWER positions. For units above 12 kW (up to 120 kW), an external 10 dB Attenuator is connected to the Waveguide Coupler output (UUT power is scale reading multiplied by ten). Power is calibrated and accuracy specified from 1.0 to 12 kW.</p> <p data-bbox="334 1129 1398 1209">NOTE: Correct calibration depends on the use of the Waveguide Coupler and Serialized Coaxial Cable furnished with RD-301A Test Set. If a replacement coupler or cable is used, the Test Set must be recalibrated.</p> <li data-bbox="285 1230 521 1257">● ΔF-MHz Scale <p data-bbox="334 1281 1406 1392">Displays amount of offset between UUT transmitter frequency and Test Set signal generator frequency. Offset is adjusted with ΔF OFFSET/EFF PEAKING Control (48). The ΔF-MHz Scale is used when METER SELECT Switch (47) is set to ΔF position.</p>
44. TRACK Indicator	Red LED illuminates when Test Set RF signal generator system has acquired and is tracking UUT transmitter frequency.
45. PANEL METER ZERO Control	Inset screw used to align PANEL Meter (43) needle to zero when LINE Switch (30) is OFF.
46. EFF READY Indicator	Green LED illuminates when Test Set is ready to measure UUT effective peak power.

ITEM	DESCRIPTION
47. METER SELECT Switch	<p>Toggle switch selects PANEL Meter (43) operating mode as follows:</p> <ul style="list-style-type: none"> ● EFF (Effective) (Peak) POWER - PANEL Meter (43) displays in kW, the UUT effective peak power resulting from effects of phase distortion and frequency inconsistencies of the UUT transmitter pulse. ● PK (Peak) POWER - PANEL Meter (43) displays UUT peak power in kilowatts. ● ΔF (Frequency Offset) - PANEL Meter (43) displays frequency offset from UUT frequency $\leq \pm 75$ kHz as adjusted by ΔF OFFSET/EFF PEAKING Control (48).
48. ΔF OFFSET/EFF PEAKING Control	<p>Offsets RD-301A internal RF signal generator frequency from UUT transmitter frequency from 0 to ± 0.75 MHz and is used when RF TRACK or RF TRACK -10 dB is selected with RF/IF MODE Pushbutton Switches (16). CAL (detent) position provides zero offset (RF signal generator frequency = UUT transmitter frequency). Offset is displayed using ΔF Scale on PANEL METER (43) when METER SELECT Switch (47) is in ΔF position.</p>
49. OFFSET Indicator	<p>Red LED illuminates when ΔF OFFSET/EFF PEAKING Control (48) is not in CAL (detent) position and RF TRACK or RF TRACK -10 dB is selected with RF/IF MODE Pushbutton Switches (16). LED indicates RD-301A is tracking magnetron frequency with offset determined by ΔF OFFSET/EFF PEAKING Control (48).</p>

B. RD-301A Rear Panel

ITEM	DESCRIPTION
50. AC INPUT Connector (49008)	Provides for 115 to 230 VAC single phase power input to the RD-301A. Power Supply Assembly automatically adjusts according to source voltage available.
51. FUSE	2.0 A, 250 V Fast Blo for 115 VAC operation or 1.0 A, 250 V Fast Blo for 230 VAC operation.
52. VCO L-BAND OUTPUT Connector (J49004)	SMA connector provides VCO sample for testing tracking accuracy at L-Band.
53. AM EXT INPUT Connector (J49005)	BNC connector provides input for external amplitude modulation. Sine, square or triangle wave signal input modulates the RD-301A reply pulse. External modulation source is 0 to 5 Vp-p providing up to 50% AM, depending on source frequency. (3 dB bandwidth at 3 Vp-p and 30% AM is from 30 Hz to 5 kHz.)
54. AUX X-BAND OUTPUT Connector (J49002)	SMA connector provides auxiliary RF output from X-Band front end for signal generator applications and calibrating tracking accuracy of Test Set at X-Band. Output level is set with OUTPUT LEVEL FINE dBm Control (4) and OUTPUT LEVEL COARSE dBm Control (9).
55. FM EXT INPUT Connector (J49006)	BNC connector provides input for external frequency modulation.
56. ANALYZER RF X-BAND XMTR Connector (J49003)	N connector provides radar signal attenuated by 56 to 68 dB for a spectrum analyzer to check X-Band front end.
57. 50% VIDEO XMTR Connector (J49007)	BNC connector provides detected pulses from the radar transmitter at TTL level and sliced at the 50% amplitude points.