

ALIGNMENT INSTRUCTIONS

• **Preparation of instruments and appliances to be used.**

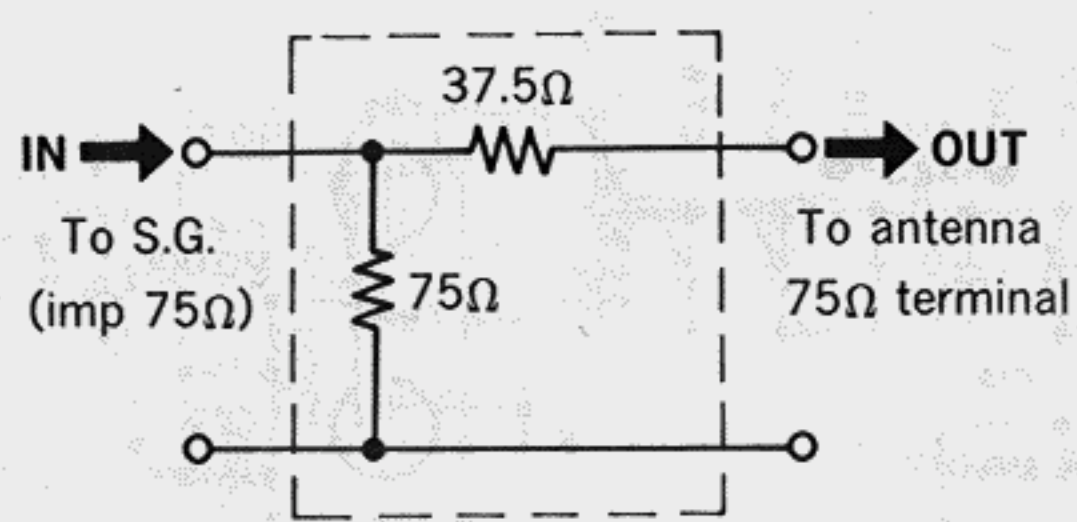
1. AC/DC VTVM
2. Oscilloscope
3. FM signal generator
4. Frequency counter
5. Distortion meter
6. FM 75Ω dummy antenna (Refer to fig. 1 on page 18)
7. Output of signal generator should be no higher than necessary to obtain an output reading.

• **Condition of the set**

1. Mpx hi-blend switch off
2. Servo tuning switch off
3. IF select switch auto
4. Output level control. maximum
5. When TP302 and TP303 are short-circuited, the NARROW IF circuit is always established irrespective of the IF switch.

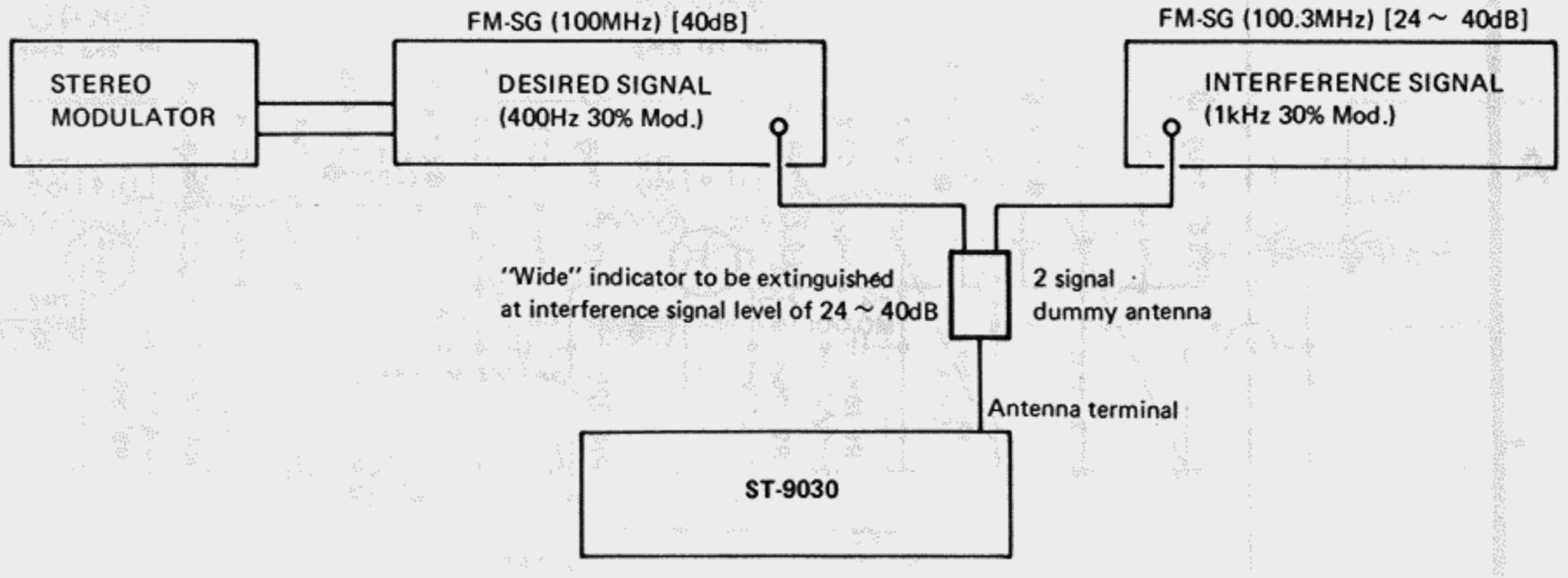
FM SIGNAL GENERATOR		DIAL SETTING	INDICATOR CONNECTION (VTVM, SCOPE and DISTORTION METER)	ADJUSTMENT POINTS	REMARKS	
CONNECTION	FREQUENCY					
IF AND RF ALIGNMENT						
1		No-signal	Point of non-inter-ferece	Connect DC VTVM between TP201 and chassis.	T201 (NARROW IFT) [A]	Adjust for 0mV of VTVM indication
2		No-signal	Point of non-inter-ferece	Connect DC VTVM between TP101 and chassis.	T102 (WIDE IFT) [A]	
3	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	90MHz (100% Mod. with 400Hz)	90MHz	Connect scope to output terminal.	L8 (OSC Coil) L7 (Buffer Coil) L6 (2nd DET-2) L5 (2nd DET-1) L4 (1st DET-2) L3 (1st DET-1) L2 (ANT-2 Coil) L1 (ANT-1 Coil) T1 (MIX Coil)	<ul style="list-style-type: none"> • Short between TP302 and TP303 • Adjust for maximum output. • Repeat steps (1), (3) and (4).
4	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	106MHz (100% Mod. with 400Hz)	106MHz	Connect scope to output terminal.	CT8 (OSC Trimmer) CT7 (Buffer Trimmer) CT6 (2nd DET-2) CT5 (2nd DET-1) CT4 (1st DET-2) CT3 (1st DET-1) CT2 (ANT-2 Trimmer) CT1 (ANT-1 Trimmer)	
5		No-signal	Point of non-inter-ferece	Connect DC VTVM between TP101 and chassis	T102 (WIDE IFT) [A]	Adjust for 0mV of VTVM indication
6		No-signal	Point of non-inter-ferece	Connect DC VTVM between TP201 and chassis	T201 (NARROW IFT) [A]	
OUTPUT LEVEL ALIGNMENT						
7	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	100MHz (100% Mod. with 400Hz)	100MHz	Connect AC VTVM to output terminal	VR504	<ul style="list-style-type: none"> • IF selector switch to "wide" • Tuning at 100MHz. • Adjust VR504 to 1.4V on VTVM indication
MONO DISTORTION ALIGNMENT						
8	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	100MHz (100% Mod. with 400Hz)	100MHz	Connect distortion meter to output terminal	T102 (WIDE IFT) [B]	<ul style="list-style-type: none"> • IF selector switch to "wide" • Tuning at 100MHz • Adjust for minimum distortion
9		100MHz (100% Mod. with 400Hz)	100MHz	Connect distortion meter to output terminal	T201 (NARROW IFT) [B]	<ul style="list-style-type: none"> • IF selector switch to "wide" • Tuning at 100 MHz • Short between TP302 and TP303 • Adjust for minimum distortion. • Repeat steps (8),(9) and (7).
WIDE IF AND NARROW IF OUTPUT LEVEL ALIGNMENT						
10	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	100MHz (100% Mod. with 400Hz)	100MHz	Connect AC VTVM to output terminal.	VR503	<ul style="list-style-type: none"> • Short between TP302 and TP303. • Tuning at 100 MHz • Adjust VR503 to 1.4V on VTVM indication.
MUTING ALIGNMENT						
11	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	100MHz (100% Mod. with 400Hz)	100MHz	Connect DC VTVM between TP102 and chassis.	T202 (MUTING IFT) T203 (MUTING IFT)	<ul style="list-style-type: none"> • Servo tuning switch to "auto" • Tuning at 100 MHz • Adjust for maximum on VTVM indication.
12	Connect signal generator to coaxial antenna terminal through FM dummy antenna.	100MHz (200% Mod. with 400Hz)	100MHz	Connect AC VTVM to output terminal.	VR402	In the state where adjustments in the them 11 have been completed, fully turn VR402 clockwise, and then turn the same counterclockwise for adjustment to the point where no signal is developed at the output terminal.

FM SIGNAL GENERATOR		DIAL SETTING	INDICATOR CONNECTION (VTVM, SCOPE and DISTORTION METER)	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY				
MUTING LEVEL ALIGNMENT					
13	Connect signal generator to coaxial antenna terminal through FM dummy antenna. Apply 16dB (6.3μV) to set.	100MHz (100% Mod. with 400Hz)	100MHz	Connect AC VTVM to output terminal.	VR401 • Servo tuning switch to "auto" • Adjust so that output can be obtained.
SIGNAL METER ALIGNMENT					
14	Connect signal generator to coaxial antenna terminal through FM dummy antenna. Apply 100dB (100mV) to set.	100MHz (30% Mod. with 400Hz)	100MHz	Signal meter of set	VR501 Adjust to about "4.7" on signal meter scale.
FM MPX CIRCUIT ALIGNMENT					
<ul style="list-style-type: none"> • Condition at stereo modulator section <ol style="list-style-type: none"> 1. Modulating frequency 400Hz 2. MODULATION 100% 3. OUTPUT MODE $\left\{ \begin{array}{l} L + R \\ L \text{ or } R \text{ (Separation adjustment)} \end{array} \right.$ 4. PILOT signal ON 5. MPX OUT Preliminarily adjust the frequency of the FM signal generator to 90% modulation, with PILOT set to "OFF", OUTPUT MODE to "L + R" and MOD to "100%." • FM signal generator <ol style="list-style-type: none"> 1. Signal generated 100MHz 2. Input to the set 60dB • The set is tuned to 100MHz 					
CIRCUIT TO BE ADJUSTED	CONNECTING PLACES FOR FM SIGNAL GENERATOR	STEREO MODULATOR	PORTIONS TO BE ADJUSTED	ADJUSTING PROCEDURES	
15	Voltage Controlled Oscillator (19kHz Oscillation)	Connect to antenna terminal of the set through dummy antenna	Non-modulation Monaural signal (Pilot OFF)	VR602 (19 kHz oscillation)	<ol style="list-style-type: none"> 1. Connect the frequency counter to TP601 through 100kΩ. 2. Adjust VR602 to obtain 19kHz ±30Hz
16	Level alignment between L and R	Connect to antenna terminal of the set through dummy antenna	L and R stereo signal (Pilot ON)	VR702 (Level alignment)	<ol style="list-style-type: none"> 1. Connect AC electronic voltmeter to "REC OUT" terminal of the set. 2. Adjust in such a manner that L output at the time of L modulation of the antenna input and R output at the time when input is subjected to R modulation are in the same level.
17	Pilot cancel	Connect to antenna terminal of the set through dummy antenna	Non-modulation Stereo signal (Only pilot ON)	VR601 (pilot cancel) L601 (pilot cancel)	<ol style="list-style-type: none"> 1. Connect oscilloscope or AC electronic voltmeter to TP602. 2. Repeat adjustments of VR601 and L601 to bring the output (19 kHz) to minimum.
18	Pilot bandpass filter	Connect to antenna terminal of the set through dummy antenna	L and R stereo signal	L602 (pilot Bandpass filter)	<ol style="list-style-type: none"> 1. Connect distortion factor gauge to "REC OUT" terminal of the set. 2. Make adjustment so that distortion of L channel output becomes minimum.
19	Subcarrier cancel	Connect to antenna terminal of the set through dummy antenna	Non-modulation Stereo signal	CT701 (Subcarrier cancel)	<ol style="list-style-type: none"> 1. Connect AC electronic voltmeter to "OUTPUT" terminal of the set. 2. Make adjustment to bring the output to minimum.
20	Wide separation	Connect to antenna terminal of the set through dummy antenna	L or R Stereo signal (1 kHz 30% modulation)	VR701 (Wide separation)	<ol style="list-style-type: none"> 1. Connect AC electronic voltmeter to "OUTPUT" terminal of the set. 2. Make adjustments so that, when the antenna input is subjected to L modulation (or R modulation), R channel output (or L channel output) becomes minimum.
21	Narrow separation	Connect to antenna terminal of the set through dummy antenna	L or R Stereo signal (1 kHz 30% modulation)	VR703 (Narrow separation)	<ol style="list-style-type: none"> 1. Short-circuit TP302 and TP303 to form narrow circuit. 2. Adjust VR703 in the similar order as in 20 (wide separation). 3. After completion of adjustments, release TP302 and TP303 from the short-circuited state.
22	Auto high-blend	Connect to antenna terminal of the set through dummy antenna. Adjust the input to the set to 31 dB	L or R Stereo signal (1 kHz 30% modulation)	VR502 (Auto high-blend)	<ol style="list-style-type: none"> 1. Connect AC electronic voltmeter to "OUTPUT" terminal of the set. 2. Before adjustments, keep VR502 fully turned counterclockwise. 3. Measure the output difference (separation) between R channel output and L channel output at the time when antenna input is subjected to L modulation. 4. Measure the output difference between L and R as in the previous item, with high-blend witch set to "auto", and adjust VR502 to obtain the same output difference (separation) as measured in the previous item.
23	Auto IF selector	Connect to antenna terminal of the set through dummy-antenna. Adjust the input to the set to 60 dB.	Non-modulation Monaural signal	T301 (300kHz) T302 (200kHz)	<ol style="list-style-type: none"> 1. Apply sine wave of 200kHz to TP101. 2. Connect oscilloscope to TP301, and adjust T302 so that waveform of 200kHz becomes maximum. 3. Subsequently apply sine wave of 300kHz to TP101. 4. Adjust T301 so that the output waveform of TP301 becomes maximum. 5. Repeat adjustments at 200kHz and 300kHz.



75Ω FM DUMMY ANTENNA

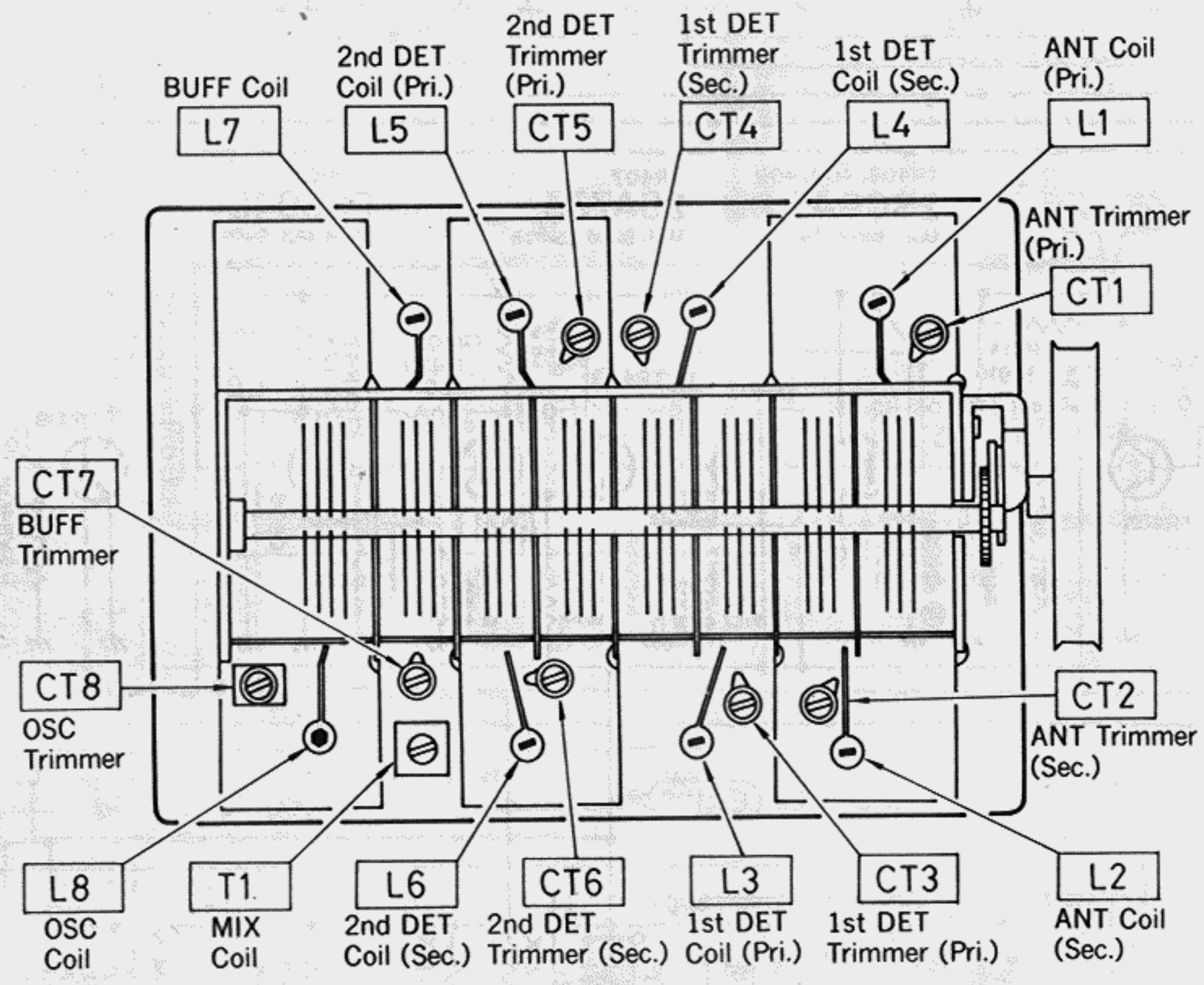
Fig. 1



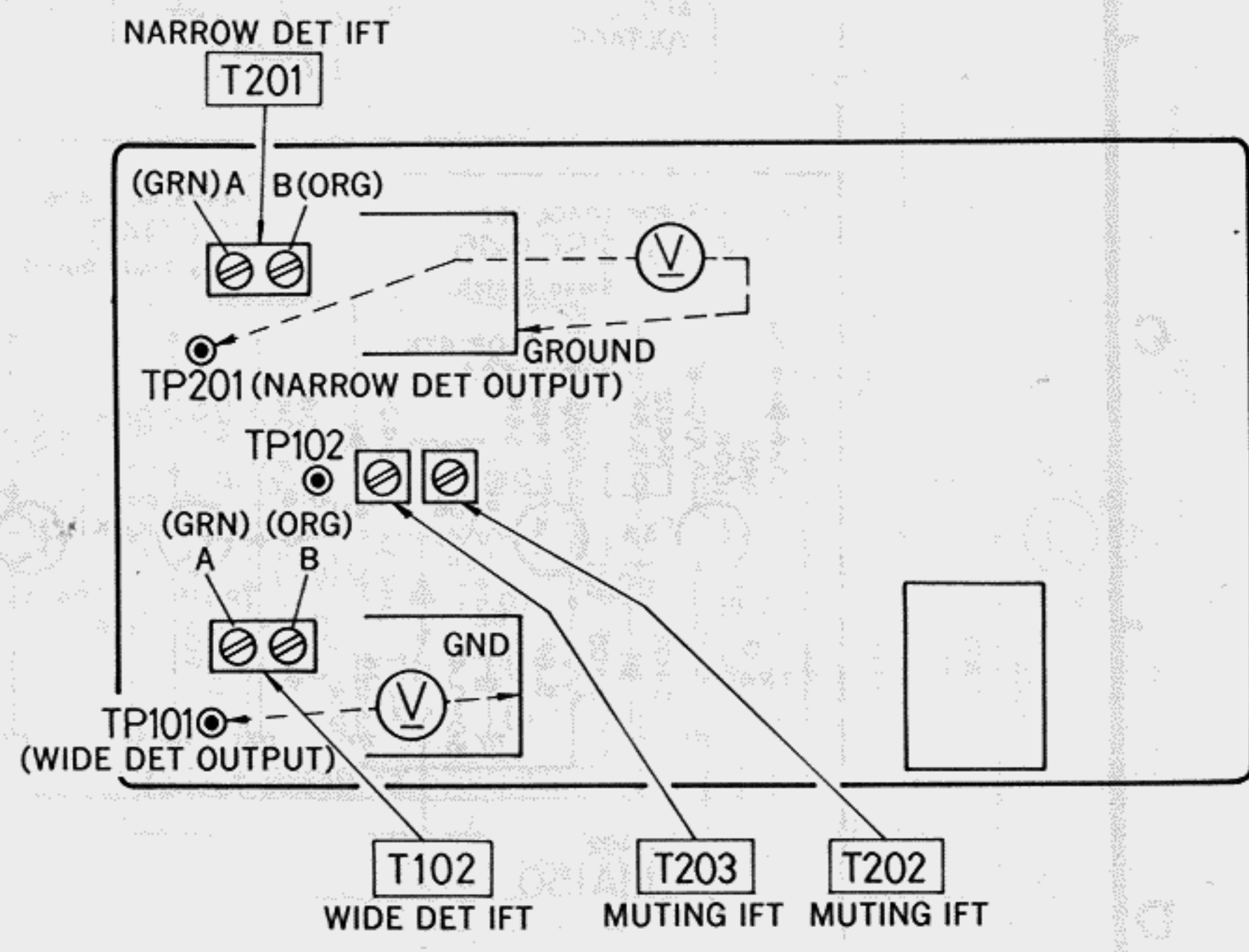
(CONFIRMATION OF FUNCTIONING OF AUTO IF SELECTOR CIRCUIT)

ALIGNMENT POINTS

FRONT END



IF CIRCUIT



MPX CIRCUIT

