MSR 2000 Jumper Tables

All MSR 2000 stations shipped with an exciter, at least 1 receiver, and an R1 Audio/Squelch card. Repeater stations also included a Squelch Gate card and a Time-out Timer. The balance of the card complement is determined by the type of control and other options such as Private-Line® (PL), Digital Private-Line® (DPL), multi-frequency transmit and/or receive, paging, etc.

The following tables list the jumper settings for the basic, fully-optionable, and duplex backplanes, as well as the most common modules found in the MSR 2000. I thought it might be nice to have them all in one convenient listing, and hope you find them useful.

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Basic Backplane TLN2472

Type of Station	JU1	JU2	JU3	JU4	JU5	JU6	JU7
Remote Base – DC control	IN	A	B	OUT	C	D	OUT
Remote base – Tone control	OUT	A	B	OUT	C	D	OUT

A. OUT for Private-Line® squelch, in for carrier squelch
B. Normally OUT, IN for paging option
C. Normally OUT, IN for Low Band receiver
D. Normally OUT, IN for battery alert tone

Jumper Functions

JU1   Un-notched mic hi
JU2   Keyed A+
JU3   R2 mute; page (TX PL inhibit)
JU4   F1 oscillator GND., F1 channel element
JU5   Ground: line driver GND, VR1 anode, alert tone GND, spkr.
JU6   R1 input, line driver output (un-notched RX audio and/or intercom fed)
JU7   Exciter audio hi

Fully-Optionable (TLN2473, 2474) and Duplex (TLN2475) Backplanes

Type of Station	JU1	JU2	JU3	JU4	JU5	JU6	JU7	JU8	JU9	JU10	JU11	JU12	JU13	JU14	JU15
Base – DC Control	IN	OUT	IN	OUT	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT
Base – Tone Control	OUT	OUT	OUT	OUT	3	3	3	OUT	4	5	6	7	8	8	OUT
RT RPTR – Non-wireline	IN	OUT	OUT	IN	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT
RT RPTR – DC Control	IN	1	2	OUT	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT
RT RPTR – Tone Control	OUT	OUT	OUT												
RA RPTR	IN	OUT	OUT	IN	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT
RA Base – DC Control	IN	OUT	OUT	IN	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT
RA Base – Tone Control	OUT	OUT	OUT	OUT	IN	OUT	OUT	OUT	4	5	6	7	8	8	OUT

1. JU2 normally OUT, IN when TLN5257A Repeater Control Module used
2. JU3 normally IN, OUT when Option C143 (Remote RPTR Control) used
3. Normally, JU5 IN and JU6 and 7 OUT; JU5 OUT and JU6 and 7 IN for 4-freq. RX and TX operation
4. JU9 IN for Carrier Squelch and DPL; OUT for PL
5. JU10 normally OUT; IN when Option C13 (Remote Squelch Control) used
6. JU11 normally OUT; IN for Low Band RCVR 1
7. JU12 normally OUT; IN for Low Band RCVR 2
8. JU13 and 14 normally OUT, except as follows:
   a. If a normal base station with battery alert tone is used, JU13 is IN and JU14 is OUT
   b. If a RPTR station with battery alert tone is used, JU14 is IN and JU13 is OUT

Jumper Functions

JU1   Un-notched mic hi, exciter audio hi, repeater audio
JU2   R2 mute, page; Rptr. on; R2 mute atten., rptr. turn off, R2 osc.
JU3   ", TX PL inhibit, line driver disable no. 2
JU4   F1 oscillator ground, F1 channel element, keyed A- enable
JU5   PL disable control
JU6   R1 squelch attenuation, R1 osc. gnd.
JU7   R2 osc. gnd., rptr. turn off
JU8   A+; antenna relay protect ckt., (CR1 anode & R2), 4-freq. Reg. 5.6 VDC
JU9   Keyed A+, delayed keyed A+
JU10 R1 discriminator input, R1 squelch
JU11 Ground: line driver ground, VR1 anode, alert tone ground, spkr. -; low band rcvr. 1 extender on/off (source)
JU12 "   "   "   "   "   "   "   "   "   "   ; low band rcvr. 2 extender on/off (source)
JU13 R1 input; line driver output (un-notched receiver and/or intercom audio), battery alert tone
JU14 Exciter audio hi, repeater audio, battery alert tone
JU15 Key inhibit, wild card 3, matrix 3

TRN5321 Station Control Module

JU1 IN for line levels below 0 dBm, OUT for line levels above 0 dBm
JU2 thru JU8 IN for all wireline control base stations and (RT) repeaters
JU9 IN for PL operation, OUT for carrier squelch
JU10 OUT for non-wireline repeaters

TRN3235, 36, 37 Line driver Modules

Line Driver		JU1	JU2	JU3	JU4	JU5	JU6	JU7	JU8	JU9	JU10	JU11	JU12	JU13	JU14	JU15	JU16	JU17	JU18	JU19	JU20	JU21	JU22	JU23	JU24
TRN5235 4-wire	A	OUT	IN	OUT	OUT	OUT	OUT	IN	OUT	IN	IN	IN	OUT	IN	OUT	IN	IN	IN	OUT	IN	IN	IN	OUT	OUT	OUT
	B	OUT	IN	OUT	OUT	OUT	OUT	IN	OUT	IN	IN	IN	OUT	IN	OUT	IN	IN	IN	OUT	IN	IN	IN	OUT	IN	IN
	C	OUT	IN	OUT	OUT	OUT	IN	IN	IN	IN	IN	IN	IN*	OUT	OUT	IN	IN	IN	OUT	IN	IN	IN	OUT	IN	OUT
TRN5237	D	OUT	OUT	OUT	OUT	OUT	IN	IN	IN	IN	IN	IN	IN*	OUT	IN	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	IN	IN
TRN5236	E	OUT	OUT	OUT	OUT	OUT	IN	IN	IN	IN	IN	IN	IN*	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

A – 4-wire, 1 RX; RX audio on line 2 (R57 removed in this application)
B – 4-wire, 2 RX, R1 priority; RX audio on line 2
C – 4-wire, 2 RX, R1 audio on line 1, R2 audio on line 2
D – 2-wire, 2 RX
E – 2-wire, 1 RX

*JU12 is cut in tone remote applications

R2 audio muting

R2 Audio Attenuator	Jumper Configuration
10 dB	JU22 IN; JU23, 25, 26, 27 OUT
20 dB	JU22, 25 IN; JU23, 26, 27 OUT
30 dB	JU22, 25, 26 IN; JU23, 27 OUT
Complete muting	JU2 OUT, JU23 IN

Receiver Priority

Priority	Jumper Configuration
RCVR 1	JU18 OUT, JU24 IN
RCVR 2	JU18 IN, JU24 OUT
1st come, 1st served	JU18 and JU24 IN

DC Transfer Modules TRN5240, 54, 55, 56

	Model	JU1	JU2	JU3	JU4
F1-PL	TRN5240	IN	OUT	OUT	OUT
F2-R2 Mute	TRN5256	OUT	IN	IN	OUT
F1 Cont.	TRN5254	IN	OUT	OUT	OUT
C2-R2	TRN5255	OUT	OUT	IN	OUT

DC Transfer (Option) Module TRN5239, 57

	Model	JU1	JU2	JU3	JU4
Paging	TRN5239	IN	OUT	OUT	IN
RPTR Control	TRN5257	IN	OUT	IN	OUT

F1-CS (TRN5322, 27) and F1-PL (TRN5320, 28) Tone Control Modules

Jumper JU2 removed for multi-frequency and paging transmitters.
Jumper JU3 IN to allow reset of receiver PL circuitry each time line PTT occurs

F2 Tone Control TRN5235, F2-R2 Mute Tone ControlTRN5326, C2-R2 Tone Control TLN2444

Switch/Jumper	F2 Control	F2-R2 Mute Control	C2–R2 Control
S1	F1/F2	F1/F2	F1/F2
S2	(Not used)	R2 Mute	Rec F1
S3	(Not used)	R2 unmute	Rec F2
JU1	(Not used)	IN Permits F1 TX command to mute RCVR R2. When JU1 is OUT, 1750 Hz tone command must be generated to mute R2.	IN Permits F1 TX command to enable F1 RX oscillator and disable F2 RX osc. Simultaneously. When JU1 is OUT, 1750 Hz tone command must be generated to enable F1 RX osc.
JU2	(Not used)	IN Permits F2 TX command to unmute REVR R2. When JU2 is OUT, 1650 Hz tone command must be generated to unmute R2.	IN Permits F2 TX command to enable the F2 RX oscillator and diable the F1 RX osc simultaneously. When JU2 is OUT, the 1650 Hz tone command must be generated to enable the F2 RX osc.

TRN5324 Squelch Gate Module

Application	JU1	JU2	JU3	JU4	JU5	JU6	JU7	JU8	JU9	JU10	JU11	JU12	JU13	JU14	JU15
Line Control Base	OUT	OUT	IN	OUT	OUT	OUT	IN	IN	IN	OUT	OUT	OUT	Selected Delay	IN	
Repeater (RT) Station w/o wireline control	OUT	OUT	IN	IN PL	IN	IN	IN	IN	IN	IN	IN	IN	Selected Delay	IN CS	IN PL
Repeater (RT) Station with wireline control	OUT	OUT	IN	IN PL	OUT	OUT	IN	IN	IN	IN	OUT	IN	Selected Delay	IN CS	IN PL
Base (RA) Station	IN	OUT	IN	IN PL	NOTE	NOTE	IN	*	*	OUT	OUT	OUT	Selected Delay	IN CS	IN PL
Repeater (RA) Station	OUT	OUT	IN	IN	NOTE	NOTE	OUT	*	*	OUT	OUT	OUT	Selected Delay	IN CS	IN PL
Community Repeater (RA) Station	OUT	OUT	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	Selected Delay	OUT	IN

Note: Jumpers JU5 and JU6 are OUT for tone controlled stations, and IN for DC controlled stations

*Relay Application Chart

TLN4151 Relay Kit	Diode CR15	JU8	JU9
Not used	OUT	IN	IN
Used	IN	OUT	OUT

Single Tone Decoder Module TLN2442

JUMPER	Repeater (RT)	Community Repeater (RT)
JU1 (see note)	IN for non-lock, OUT for Lock	IN for non-lock, OUT for Lock
JU2 (see note)	OUT for non-lock, IN for Lock	OUT for non-lock, IN for Lock
JU3	IN	IN
JU4	OUT	OUT
JU5	OUT	IN
JU6	IN	OUT
JU7	OUT	OUT

Note: This module can be strapped for non-locked or locked operation via jumpers JU1 and 2. Non-locked signifies that decoder outputs automatically revert back to the "before received single-tone decode" state (after the 5-second interval). Locked signifies that the decoder outputs do not automatically revert upon loss of single-tone. Rather, the outputs remain "set" until reset either by a high applied to pin 9 or switch S752 momentarily placed in the reset position. Switch S752 is functional only when the decoder is strapped for the locked mode.

Squelch Control Option Decoder Module TLN2445
Repeater Control Option Decoder Module TLN2446
Private-Line Control Option Decoder Module TLN2447

Application Table

	Squelch Control Module	Private-Line Control Module	Repeater Control Module
S1	Max. Squelch	Operate PL	RPTR knockdown
S2	Min. Squelch	Operate carrier squelch	RPTR setup
Q3/Q4	Operate maximum squelch	Operate PL	Repeater turnoff
Q6/Q7	Operate threshold squelch	Operate carrier squelch	Repeater setup
R31	Low squelch control	(not used)	(not used)
JU1	OUT	OUT	IN
JU2	IN	OUT	OUT
JU3	OUT	IN	OUT
JU4	OUT	OUT	OUT

"Wild Card" Control Module TLN2448

Operation with relays

Function Tone (Hz)	Bistable & relay operated	N.O output	C. Output	N.C. Output	Remove jumper
1350	No. 1	3	4	5	JU1
1250	No. 2	8	9	10	JU2
1150	No. 3	16	18	17	JU3
1050	No. 4	23	24	22	JU4

Operation without relays (Jumpers JU1 – JU4 must be IN)

Function tone (Hz)	Bistable operated	Output pin
1350	No. 1	3
1250	No. 2	8
1150	No. 3	16
1050	No. 4	23

To Operate Bistables as Pairs

	Connect Jumpers	Remove Jumpers
No. 1 & No. 2	JU5, JU6, JU9	JU11
No. 3 & No. 4	JU7, JU8, JU9, JU10	JU11

R1 Audio and Squelch Modules TRN9688, 89, TRN5068, 69

Jumper	IN	OUT
JU1	No PL filter used	PL filter used
JU2	For *Spectra-Tac®* option	Normally
JU101	Normally	For Remote Squelch option
JU102	For PL, DPL, repeater, Single Tone Decoder, and Remote Squelch option	Normally
JU103	For Remote Squelch option	Normally
JU104	For PL "OR" squelch	For PL "AND" squelch
JU105	For PL squelch	For carrier squelch
Diode	IN	OUT
CR1	For Intercom option	Normally
CR2	Normally	For Intercom option
CR106	Normally	For repeater

R2 Audio and Squelch Modules TRN9690, 91, TRN5070

Jumper	IN	OUT
JU1	For carrier squelch	For PL squelch
JU2	For factory test	Normally
JU101	Normally	For PL "AND" squelch
JU102	Normally	For carrier squelch
JU201	Normally	When using 67 Hz reed

R2 Audio and Squelch Modules TRN9692, TRN5072 (DPL)

Jumper	IN	OUT
JU2	For factory test	Normally
JU101	Normally	For PL "AND" squelch
JU102*	Normally	For carrier squelch
JU301	Note	Note
JU302	Note	Note

Note: JU301 and JU302 determine code polarity. JU301 is used in UHF and VHF applications (low side injection). JU302 is used in low band applications (high side injection).

Tone *Private-Line*® Encoder-Decoder Modules TRN5073, 74, 75

Jumper		Simplex	Duplex
	TxA RxA	**TxA RxB**	**TxA RxB**
JU1	IN	IN	OUT
JU2	IN	IN	OUT
JU3	IN	OUT	OUT
JU4	IN	OUT	IN
JU5	OUT	OUT	IN
JU6	IN	IN	OUT
JU7	IN	IN	OUT
JU8	Normally IN, OUT when using 67 Hz reed		

Digital Private-Line® (DPL) Encoder-Decoder Modules TRN5076, 77, 78

Operation Mode	JU3	JU4	JU101	JU102
Simplex TxA RxA	IN	IN	OUT	OUT
Simplex TxA RxB	IN	IN	OUT	OUT
Duplex TxA RxB	OUT	OUT	IN	IN