
LAND MOBILE PRODUCT SECTOR PSB # 718 1301 E. ALGONQUIN RD APC #
388/398 SCHAUMBURG, IL 60196 Date: JANUARY,1993 (708) 576-6242 EXPIRES :
N/A

Subject: VARIOUS DIGITAL MSF 5000 ISSUES

MODELS AFFECTED: ALL DIGITAL CAPABLE MSF STATIONS

I. FIRMWARE RELEASE INFORMATION

1. Firmware Release and Board Compatibility Information

Beginning on October 8,1992, version 5.45 SSCB and version 5.29 TTRC firmware shipped from the factory. This firmware is compatible with the previous release (version 5.37 SSCB and version 5.21 TTRC) such that it is not necessary that both are changed together. The following table shows firmware compatibility:

SSCB	TTRC	SECURE	SSCB BRD	TTRC AUDIO	TTRC LOG	SECURE	RSS
-----	5.37	5.21	4.22	ALL	TLN3112A/B/C	-----	
TLN3114A/B/C	ALL >5.16	5.43	5.29	5.45	-----		
-----	4.06	5.04	4.02	ALL	TLN3112A	TLN3114A/B/C	ALL >4.08
-----				3.25	4.22	3.17	ALL
ALL >4.08	-----						3.25
TLN3112A	TLN3114A/B/C	ALL >4.08	-----				3.17
-----							ALL

NOTE: WHEN ORDERING NEW CONTROL BOARDS FROM THE PARTS DEPARTMENT BE AWARE THAT THE BOARDS WILL COME WITH THE LATEST FIRMWARE ON THEM. THERE FORE YOU MUST USE THE FIRMWARE FROM THE EXISTING BOARDS OR ORDER THE QVN1000A FIRMWARE UPGRADE KIT WHICH CONTAINS ALL 3 FIRMWARE PROMS FOR THE STATION BOARDS.

SSCB BOARD KITS ARE: TLN3059A/B, TLN3043A/B, TLN3137A, TLN3182A, TLN3189A, TLN3204A, TLN3205A, TLN3318A, TLN3319A, TLN3320A.

TTRC AUDIO BOARD KITS ARE: TLN3112A/B/C TTRC LOGIC BOARD KITS ARE: TLN3114A/B/C

SECURE BOARD KITS ARE: TLN3045A/B/C, TLN3267A

MSF10000 TTRC BOARD TRN7132A/B WORKS WITH ANY FIRMWARE GREATER THAN VERSION 4.16.

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VERSION NUMBER TO PART NUMBER CROSS REFERENCE -----
 ----- SSCB TTRC SECURE 5.45 - 5191012H75 5.29 -
 5191012H74 4.22 - 5191012H65 5.43 - 5191012H73 5.21 - 5191012H64 4.02 - 5191012C79
 5.37 - 5191012H63 5.04 - 5191012C78 3.17 - 5191012C31 4.07 - 5191012C82 4.22 -
 5191012C30 3.09 - 5191006C49 4.06 - 5191012C77 4.16 - 5191006C54 3.07 - 5191006C20
 3.25 - 5191012C29 4.10 - 5191006C17 3.21 - 5191012C08 3.15 - 5191006C16 -----

II. PROBLEMS FIXED WITH LATEST VERSION FIRMWARE

1. FAILSOFT (TRUNKING ONLY) HEARING A LOW FREQUENCY RUMBLE IN SUB- SCRIBER UNITS.

The failsoft code word can be heard in the subscriber units as low frequency rumble when using SSCB version 5.37. This was corrected in version 5.43 release. During the generation of alarm tones, the failsoft code word is muted in version 5.37. Although the station is programmed not to send the tones, the station still goes through this routine if alarms are present on the muxbus. This would be perceived as periodic loss of failsoft code word, causing the subscriber units to squelch.

2. PASSWORD (FEATURE ADDED DUE TO MODEM ACCESS TO STATIONS)

Password protection was added in version 5.37 due to the addition of the remote callup feature. We feel it is necessary to protect the station if a modem is connected to it. The problem was that a blank (new) board from the factory could not be programmed in the field, since the password locked you out. This was corrected in version 5.43 by disabling the password when it sees the code plug is blank.

3. STATUS TONE (FEATURE CAN NOW BE TURNED OFF IF NOT REQUIRED)

In all TTRC firmware previous to version 5.29, status tone was always generated if the station was Spectra Tac or Simulcast equipped. The status tone could not be shut off in the RSS. Due to numerous requests this has been changed. Version 5.29 allows the status tone to be turned off. Factory programming in the past never set the status tone enable bit, so if you are upgrading to version 5.29 firmware, you must build a new code plug from the default code plug files in the RSS in order to enable the status tone. Future releases of RSS will allow the status tone field to be altered, but version 5.16 RSS does not allow this at this time. Also note that RSS 5.16 will show the status tone field as ENABLED, even though it is not enabled.

4. RECEIVER NOTCH FILTER (CAN NOW BE ENABLED OR DISABLED AS NEEDED)

There exists a receive 2175 HZ notch filter in the MSF that is controlled via a software controlled gate. In the past, this gate called BYPASS RX NOTCH in the RSS, could not be changed if the station was Spectra Tac or Simulcast equipped. Version 5.29 TTRC firmware allows this filter to be ENABLED OR DISABLED in all cases. Note that previous firmware incorrectly bypassed the filter when it was needed for Spectra Tac or Simulcast systems. This caused voice audio to false a status tone detect on the comparator intermittantly, or could cause a receiver of poorer audio quality to be voted.

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5. SITE FAILSOFT (FUNCTIONS IN ALL TRUNKING WIDE AREA SYSTEMS WITH SSCB VERSION 5.43 FIRMWARE)

Version 5.37 SSCB firmware added additional capability for wide area trunked systems. The station can now operate as wide area trunking, site trunking, wide area failsoft, or site failsoft, by properly setting the failsoft type in the RSS. Version 5.37 does not work in the site trunking mode since TDATA is inadvertently muted. Version 5.43 firmware has corrected this problem.

6. TRUNKING WITH SPECTRA TAC AND CONSOLES (AUDIO MIX PROBLEM AT THE CONSOLE)

In systems of this nature, there was an audio mix problem at the console. The console would hear direct receive audio mixed with voted audio. This was corrected in version 5.29 TTRC firmware.

7. UHF CONVENTIONAL STATIONS WITH DPL (DISTORTED DPL WAVEFORM)

Version 5.43 SSCB firmware causes a distorted DPL waveform for the first few seconds of a transmission, causing the subscriber unit not to open squelch for the period of time. Only a small quantity of these stations shipped. The synthesizer in the UHF station is different than all the other bands and thus the only one affected. Version 5.37 firmware did not have the problem and it was corrected in version 5.45.

8. NEW RF POWER ALARMS (SET ONLY IN STATIONS EQUIPPED WITH A WATTMETER ELEMENT) (CONSTANT POWER ALARMS IN CONVENTIONAL STATIONS)

Version 5.xx SSCB firmware has added muxbus alarms for forward power, reflected power, and TSTAT to aid in analysis for trunking systems. RWC5 is the TSTAT alarm, RWC6 is the reflected power alarm, and RWC7 is the forward power alarm. A wattmeter element is required for these alarms to function. (The wattmeter is standard on trunking models). However, if you attempt to set the forward and reflected trip points without the wattmeter, you will create a constant alarm condition. The trip points can be reset with RSS version 5.16, but requires a special procedure. See Procedure 718A attached for assistance.

III. RADIO SERVICE SOFTWARE (RSS) ISSUES.

Version 5.16 is still the latest shipping version, but there are four minor bugs that are easy to overcome, once you know how. Next version RSS due by end of First Quarter 93 will resolve these bugs.

1. CONNECT TONE CHANGES IN SECURE TRUNKED SYSTEMS

In secure trunking, the station generates connect tone and sends it to the central controller. The connect tone field in version 5.16 only changes the receive side, and does not change the outbound tone. This can be changed using version 5.16 and a special procedure. See Procedure 718B attached for assistance.

2. DVP OPTION C794 (CODED AUDIO DEGRADES OVER TIME)

When using DVP in the half duplex mode, the secure board is set in the full duplex mode, and 2 hybrids are used. RSS version 5.16 incorrectly re-sets this parameter when the advanced information screen is accessed. The symptom is that coded audio degrades with time, and is restored when key is re-loaded. The full duplex bit can be reset with 5.16, but requires a special procedure. This does not apply to XL, DES, or DES XL. See Procedure 718C attached for assistance.

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3. EXTERNAL PTT

The EXT PTT bit can NOT be set using version 5.16 RSS if the SSCB firmware version is 3 or 4. This problem does not exist with version 5 of SSCB firmware.

4. SPARE OUTPUT

Once the spare output has been set, it can NOT be changed back to NULL. If this causes a problem, then start with a default file and re- build a new code plug.

IV. STATION SOFTWARE ISSUES

1. STATION FALSES INTO STANDBY MODE (GOES TO SLEEP)

There have been numerous reports of stations "going to sleep" where there is no transmit or receive operation until the station is reset. In this mode, the RX inhibit and TX inhibit bits are active on the mux bus. This can be caused by the TRC command STBY ON falsing. This command activates these inhibit bits to remove the station from service. The only command the station will respond to in this mode is STBY OFF. If you are experiencing this problem, remove the STBY ON and STBY OFF commands from the tone remote table.

2. TSTAT ERRORS CAUSED BY TDATA DROP OUT DELAY EXPIRATIONS

Starting with TTRC version 5.29 the presence of TDATA became a requirement for the TSTAT signal to be generated in trunking stations. In some station configurations the TDATA detector times out while TDATA is actually present. This can cause random otherwise unexplainable TSTAT errors at the central controller. To fix the problem the TDATA detector timer can be extended with a special procedure. See Procedure 718D attached for assistance. The next release of RSS beyond 5.16 is scheduled to have this timer user editable.

3. SECURE CODE DETECT AND VOTING (POOR VOTED AUDIO BEING EXPERIENCED)

Secure voting using a Digitac comparator and MSF receivers can have poor voted audio if several weak signal receivers are mixed with one or more strong signal receivers. Since secure voted audio is a composite of all receivers getting a code detect, if one receiver is full quieted and other receivers are noisy the voted audio can actually be worse than the best receiver's audio. A solution is to make secure code detect at the MSF tougher to achieve, so

that only reasonably strong secure audio gets fed to the comparator to be voted. A procedure exists to change the code detect thresholds to approximate a 20 DBQ clear signal strength equivalent. See Procedure 718E attached for assistance.

V. STATION HARDWARE ISSUES

1. FAILSOFT DEVIATION (NOT EEPOT ADJUSTABLE WITH VERSION 5.XX FIRMWARE)

When using version 5 or greater SSCB firmware, the failsoft codeword is generated on SSCB, and not on TTRC as it was in the past. Therefore, EEPOT B does not affect the level of failsoft deviation as described in the station alignment procedure. The failsoft deviation is now a fixed level, and cannot be adjusted via EEPOTs. Stations shipped

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between March-July 1992 had deviation level that was not optimum, although subscriber units still could detect the codeword. If you desire to achieve the specified failsoft deviation level stated in the station manual, then change R8110 on the SSCB board to 51KOHMS for TLN 3204A and TLN3189A, or 33KOHMS for TLN3205A and TLN3182A boards.

2. LINE PTT DROPOUTS ON B VERSION TLN3112 TTRC BOARDS

The ALC circuit on the B version board continues to adjust the line input level during the course of a transmission, while the A version board locked the gain based on the level of High Level Guard Tone. This change has caused problems in some systems if peak audio levels exceed the level of High Level Guard Tone. The mechanism is that as input level increases, the gain of the ALC decreases, thus the level of 2175 HZ in the Low Level Guard Tone detector circuit decreases. This level can decrease to a point where LLGT is no longer detected and the station de-keys. A board re-design is being done to correct the problem. Contact Product Services for assistance.

3. JU14 ON SSCB (ADDED FOR FUTURE OPTION EXPANSION)

This jumper was added on later SSCB boards to provide an additional audio input for future options. The circuit has a stability problem, however, if JU14 is put in the ALT position. This can cause a regen problem with U819 which causes it to overheat and fail. Therefore, NEVER PUT JU14 IN THE ALTERNATE POSITION.

4. DTMF DIGIT "6" FALSING CODE DETECTS (IN SECURE SYSTEMS USING DTMF OPERATION)

In some systems which mix MSF secure operation and DTMF it has been determined that DTMF digit 6 can cause a false code detect on the MSF secure board. If DTMF is to be combined with secure operation in a given system it is suggested that digit 6 use be avoided.

NOTE: For shops using the MSIN network: copies of Procedures 718A -- 718E referenced above have been placed on the MSIN Bulletin Board for your convenient access.

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